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RESEARCH ARTICLE

THE IMPACT OF INDIRECT MATERIAL INVENTORY ON THE PROFITABILITY OF BREWERY COMPANIES IN NIGERIA

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ABSTRACT

This study examined the impact of indirect material inventory on the profitability of brewery companies in Nigeria. A sample of two brewery companies listed on the Nigeria stock exchange was used for this study. Regression analysis was applied to annual data sourced from annual report and accounts of the sampled companies for the period 1989-2008. The result indicates that indirect material inventory has significant influence on the profitability of Nigeria brewery Plc and Aggregate Company. It also shows that indirect material has insignificant influence on the profitability of Guinness Nig. Plc. The findings confirm that there is a significant relationship between profitability and indirect material inventory in line with the previous studies. This implies that the brewery companies in Nigeria should ensure adequate use of indirect material inventory as they contribute to the efficient functioning of the production machinery.

INTRODUCTION

Whenever the operations of the business include the ownership of inventory, it becomes very important that adequate inventory management techniques be adopted. Inventory consists of raw material, work-in- progress, finished goods and indirect material. Indirect material is a category of material and includes all the items used to support production and operation (Onuigbo, 2010). These items are not physically part of the finished product but are critical for the continuous operations of plant, equipment and offices.

Millions of naira worth of spares and engineering parts as it is called in the breweries are tied/locked in obsolete items. This emphasizes the need of paying more attention on management of this indirect material. Improvement in the capacity utilization and cost reduction can be achieved by better indirect material management. Studies by Eghide (2009) have indicated that 40 percent of the total working capital is tied in spares inventory and out of this about 25percent is obsolete in terms of value. The objective of indirect material management is to provide the right parts at the right time and at a competitive and right cost.

An improper management of materials/spare parts will result into difficulties if brewery companies continued operation and consequently, sales and profit will suffer. Empirical studies in the developed countries have established that efficient inventory management improves company performance and consequently makes positive effect upon shareholders wealth.

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However, few studies in developing countries are in this direction.

In Nigeria, there are growing numbers of studies that have tested the relationship between working capital management and corporate profitability. Ogundipe, Abiola and Ogundipe (2012) and (Ogbadu, 2009) studied working capital management, firm's performance and market valuation; Amadasu, (2003) investigated effective material management and profitability; Oko, Mgbonyebi and Umeachi (2007) investigated the management of pharmaceutical inventory in the Nigeria Health industry; Raheman and Mohamed (2007) researched on impact of inventory in enhancing business growth in Nigeria. All these studies concentrated in working capital and inventory management and did not take cognizance of indirect material inventory and brewery firms' profitability. Therefore, this study aims to examine how indirect material inventory impact on profitability of brewery companies in Nigeria. The rest of the paper is divided into four sections. Section two is concerned with the theoretical framework and review of related literature. Section three elucidates the methodological framework while section four discusses the findings and section five concludes the paper.

Review of Related Literature

In cost management accounting, purchasing and supplying of engineering material and handling have dominated the literature. The importance of material management and working capital management has been an area of interest among researchers. Reasons behind this common opinion

about material management and working capital are important for manufacturing company it centers on the relationship between efficiency in management of materials and company profitability and its effects on owner's value.

In Pakistan, Lazarids and Tryfonidis (2006) investigated the effect of working capital management and profitability for sampled firms. The study sought to establish the effect of working capital management on liquidity as well as on profitability. They made use of regression and time series data. It was found that there was a significant negative relationship between net operating profit and average collection period. Falope and Ajilore (2009) investigated the relationship between corporate profitability and working capital management in a sample of 131 companies listed on the Athens stock exchange for the period of 2001-2004. The study which made use of regression analysis found that there is statistical significance relationships between profitability measured as gross operating profit and cash conversion cycle. They opined that managers can create profits for the companies by handling correctly and keeping each different component (account receivable, accounts payables, inventory) to an optimum level. In Ghost and Maji (2010) study, they utilized panel data econometrics in a pooled regression, where time series and cross-sectional observations were combined and estimated. They found a significant negative relationship between net operating profits and the average collection period, inventory turnover in days, average payment period and cash conversion cycle for a sample of fifty firms quoted on the Nigerian stock Exchange. In India Shin and Soenen (1998) examined the efficiency of working capital management of companies during 1992-1993 to 2001-2002. In measuring the efficiency of working capital management, performance, utilization, and overall efficiency indices were calculated instead of using some common working capital management ratios. It was found that the Indian cement industry as a whole did not perform remarkably well during those periods studied. In another study, Delof (2003) examined the relationship between the length of Net trading cycle, corporate profitability and risk adjusted stock return in America. They made use of correlation and regression analysis, by industry and capital intensity. They found a strong negative relationship between the length of the firm's net trading cycle and its profitability. In addition, shorter net trade cycles were associated with higher risk adjusted stock returns.
In a related study Sadlovska and Viswanathan (2007) examined the impact of working capital management on profitability for Belgian firms. Using correlation and regression tests, they found a significant negative relationship between gross operating income and the number of day's accounts receivable, inventories and account payable. On the basis of these results, they suggests that mangers could create value for their shareholders by reducing the number of days' for accounts receivable and inventories to a reasonable minimum. The negative relationship between accounts payable and profitability is consistent with the view that less profitable firms wait longer to pay their bills. Lyroudi and Lazaridia (2000) examined working capital optimization; improving performance with innovations and new technologies in inventory management and supply chain. The study made use of survey research. It was revealed that the best performing companies have cash conversion cycle (CCC) that is about 5-6 times shorter than that of the average and low performing ones. Pang Jung (2002) researched on the cash conversion cycle and liquidity analysis of the food industry in Greece and found a positive and significant relationship between the cash conversion cycle and profitability (measured by Return on investment (R01) and net profit margin (NPM). This result indicated that a longer cash conversion cycle can improve company's profits. Inventory is one of the components which make up working capital and this why the studies reviewed above are related to inventory management. All the above studies provided us with a suitable background regarding inventory management and firm profitability. Also given the results of these researches, they provided us with views of already conducted researches on the same area for different countries and environment from different aspects.

METHODOLOGY

This research covers quoted brewery companies in Nigeria. The population of quoted brewery companies listed on the Nigerian stock exchange was seven brewery companies out of which a sample of two brewery companies was purposively selected using judgment sampling techniques based on the researcher's knowledge of the population. The two brewery companies chosen are those companies whose published financial reports and required data were available for the whole period under review. The data for the measure of the variables are collected from annual financial statement of the sampled companies and non-quoted companies were excluded due to non-availability and non-disclosure of their financial reports respectively. Data collected were analyzed using multiple regression analysis. The study made use of following variables: Net operating profit (p) representing profit as the dependent variable while the independent variables are: Rm representing Raw materials; (Sc) storage costs; (Fx) foreign Exchange costs (represented by foreign currencies purchased for import); (IM) indirect materials. The null hypothesis indirect material cost (maintenance, repairs and operating supplies) have no significant effect on the profitability of brewery firms in Nigeria. The analysis was guided by the following linear models:

$$P=\beta o+\beta iRM+\beta 2SCt+\beta 3Fxt+\beta 4IM+Ui$$

Where;

- P=Profit (dependant variable)
- RM= Raw Materials comprising of local and imported raw materials.
- Sc= Storage costs15% of cost of sales.
- FX=foreign exchange costs (All the foreign currencies purchased for imports).
- IM=maintenance repairs and operating supplies (addition of Engineering spares and sundry materials).
- βo=is the intercept of the regression and $\beta i,\beta 2,\beta 3,\beta 4$ are the coefficient of the regression
- Ui=is the error term capturing other explanatory variables not explicitly included in the model
- t =denotes time.

EMPRICAL RESULTS AND DISCUSSION

Regression analysis was applied to find out the impact of indirect material inventory on profitability and the results are

From Table I it will be observed that IM has negative relationship with the profitability of NB plc and aggregate

The regression equation is given by

$$P = 956706.76 + 0.103Rm + 1.59Sc + 0.628Fx - 0.933Im$$

The results of the multiple linear regression analysis carried out using data obtained from Nigeria Breweries Plc (NB Plc), Guinness Nigeria Plc and aggregate are contained in Tables I-V above. The estimated regression equation is given in the first row of Table I. the equation shows that the firms can make profit of (956706,-3588509.31 and -1722943.04 units in the absence of the dependent variables considered in this study.

Table 1. Regression Results for Aggregate and Individual Company Effect Regression Model

	Nigerian Breweries	Guinnes Nig. Plc	Aggregate
Intercept (t)	956706.755	-358509.310	-722943.037
Raw Material	0.103	0.252*	-0.899*
Storage Costs	1.590	0.105	0.620*
Foreign	0.628*	0.094	2.486*
Exchange Costs	-0.933*	0.739	0.925
Indirect Material	0.957	0.955	0.855
R	0.917	0.913	0.821
R^2	0.893	0.884	25.514
Adj R	38.551	31.347	
F – Statistics			

Source: Statistical Analysis of SPSS

* indicates that coefficient is significance at 5% significant level

Table 2. Analysis of Variance (ANOVA) – Regression of Profitability of NB PLC

Analysis of Overall Equation

Source	Df	SS (**Sum** of Squares)	MS(Mean Square)	F	P-Value
Regression	4	7.572E14	1.893E14	38.551	0.0000
Residual	14	6.875E13	4.911E12		
error	18	8.260E14			
Total					

Source: Statistical data obtained from statistical package (SPSS)

Key: (a) Predictors: (constant), Rm, Sc, Fx, Im (b) Dependent variable P

Table 3. Correlations – Regression of NB PLC Profitability

		P	SC	FX	IM	RM
Pearson Correlation	P	1.000	.788	0.15	.800	.942
	Sc	.788	1.000	.248	.608	.771
Fx		.015	.248	1.000	.296	-.0.058
Im		.800	.608	.296	1.000	.859
Rm		.942	.771	-.058	.859	1.000
Sig.(1-tailed)	P	.	.000	.477	.000	.000
	Sc	000	.	.168	.005	.000
Fx		.477	.168	.	.125	.413
Im		.000	.005	.125	.	.000
Rm		.000	.000	.413	.000	.
N	P	17	17	17	17	17
	Sc	17	17	17	17	17
Fx		17	17	17	17	17
Im		17	17	17	17	17
Rm		17	17	17	17	17

Source: Statistical data obtained from statistical package (SPSS Key:Profit (P); Storage Cost (Sc); Foreign Exchange Costs (Fx); Indirect Materials (Im); Raw Materials (Rm)

profitability of the NB Plc and aggregate.

The R-square of the estimated regression are 92%,95.5% and 85.5% Practically this means that about 92%, 96% and 86% of the variation seen in profits of NB plc, Guinness Nigeria Plc and aggregate are due to the predictor variables considered, the overall regression as seen in Tables II and III is deemed adequate if the P-value of the test is less than 0.05 (5% level of significance). The P-value here for this regression is 0.000, hence it is accepted as been highly adequate see Table III. The Hypothesis of this study showed that the parameter estimate is obtained as 0.933, 0.739, and 2.486. The P-value is 0.046, 0.0382 and 0.001. Since the P-value for NB plc and aggregate < 0.05, we reject the null hypothesis and conclude that indirect material costs have significant effect on profitability. In Nigeria the result for (brewery industries) supports the finding of (Falope and Ajilore, 2009; Delof, 2003; Sadlovska and Viswanathan, 2007).

Conclusion

Indirect material inventory is one of the major components of inventory that make up working capital. Expectedly therefore, the way in which indirect material is handled will have a significant impact on profitability. This finding is consistent with the findings of (Lizarids and Tryfonidis, 2006; Ghost and Maji, 2010; Shin and Soenen, 1998; Yun-jang, 2002). Reduction in indirect material inventory holding will lead to loss of sales, increase in waste and spoilage of beer. This is in line with suggestion of Falope and Ajilore (2009) that mangers can create profits for their companies by handling correctly the cash conversion cycle and keeping each different components (inventory Accounts payable and Accounts Receivable) to an optimum level. Therefore, a well designed and implemented indirect material inventory is expected to contribute positively to the creation of value for shareholder.

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