Effect of Production Planning on the Profitability of Listed Fast-Moving Consumer Goods Companies in Nigeria

Oyedokun, Godwin Emmanuel and Adelodun, Adeolu Ayodeji
Department of Management and Accounting, Faculty of Management and Social Sciences, Lead City University, Ibadan, Nigeria

Abstract

Profitability growth is essential to the long-term survival of any organization. This study examines the effect of production planning on the Profitability of listed FMCG companies in Nigeria. The study adopts an ex-post facto research design. The data were collected from the audited reports published by the Nigerian Stock Exchange from 2011 to 2020. The population comprises twenty-one (21) consumer goods firms listed on the Nigerian Stock Exchange floor as of 31st December 2020. The study selected eight (8) FMCGs in Nigeria based on two filter criteria. The descriptive and inferential analysis, multiple regression techniques, and the STATA13 package were used for the analysis. The findings revealed that inventory turnover enhances the Profitability of listed FMCGs in Nigeria and that workforce productivity positively affects productivity(The F-Stat chi-square = 320.99, P-value =0.000). The R^2 reveals a value of 34.39%, indicating that the production planning variables and the control variable inflation can explain the variations in the Profitability of the selected FMCGs firms in Nigeria to a percentage of 34.39%, while the remaining percentage is explained by other factors not captured in the model. The study concludes that inventory management, as indicated by inventory turnover, improves the Profitability of listed FMCGs in Nigeria and that improved workforce productivity enhances the Profitability of listed FMCGs in Nigeria, and that capital structure with higher total debt to total equity will negatively influence the Profitability of listed FMCGs in Nigeria. The study, therefore, recommended that FMCG companies' management in Nigeria should focus on strategic inventory management to improve operations efficiency and turnover, and also government and policymakers create an enabling environment and sovereign fund accessible by manufacturing companies at single-digit interest rates to improve their working capital and enable their growth.

Keywords: Fast-moving consumer goods, Production planning, Profitability

Word count: 286

JEL Classification: D24, E23, L11, M11, L25**,** P7

Introduction

Fast Moving Consumer Goods (FMCG) is one of the fastest-growing industries globally. The sector produces goods commonly used by households and considered essentials. These goods are produced in large volumes and sold more frequently. Increasing global populations, lifestyle changes, growing awareness of product innovations, and growing consumer spending power drive the FMCG market. Expansion in the supply chain contributes to the rise in the fast-moving consumer market, with supermarkets and hypermarkets accounting for more than half of the distribution channel. Despite the growing market share and turnover, some FMCG companies in Nigeria have inconsistency and decline in Profitability as a return on total assets employed.

The global FMCG market size in 2017 was about $10 trillion, projected to grow to around $15 trillion in 2025 with a compounded growth rate of 5.4%. The food and beverage segment accounts for 89% of the global FMCG market share, with healthcare at 4% and personal care at 5%. North America leads the global

market share, with the Asia Pacific leading the developing market share (Bhandalkar, 2019).

Africa's FMCG industry market share is about $240 billion. The industry's growth results from the improvement in the African economy with gains in GDP per capita and increasing consumer spending. Households living on US$2.97 per capita daily spend over 56% of their income on food items, while higher income groups spend less on FMCG products. Thus, poorer African countries with high population clusters are a potential market for FMCG industries. The African population is estimated to be 1.68 billion by 2030, which will drive the growth of FMCG products (KPMG, 2016).

With a population of 200 million, Nigeria has a significant FMCG market in Africa. In 2010, Nigeria's market share of FMCG products was $41.7 billion. Households spend 56.65% of their income on food and beverages, with only about 6% on health (National Bureau of Statistics, 2020).

Fast Moving Consumer Goods industry faces challenges that can impact their Profitability despite the considerable market opportunities. FMCG is considered a low-margin and high-volume industry, and companies operating in this sector focus more on driving sales (Jadayil, Khraisat, & Shakoor, 2017). In addition, companies use intensive and dynamic manufacturing processes due to the variety and seasonality of the products. Product shelf life, carcass utilization, and production lead time are constraints faced by consumer goods manufacturers like foods, drinks, and perishable products (Elzakker, Zondervan, Raikar, Grossmann & Bongers, 2014).

Another rising challenge in the industry is the growing consumer shift towards personalized and customized production, fragmentation of tastes and preferences, and demand for health and wellness products which the companies have to adapt to in the face of continued resource shortage and commodity price volatility (Matopoulos, Ranitovic, & Bourlakis, 2012). Technology is also disrupting the FMCG landscape by lowering the barrier to entry. With new business models such as subscription and direct-to-customer delivery, many small and medium-sized companies are penetrating the market faster with better customer relationships.

Profit from operations is one of the goals of any corporate organization, no matter the size. Profitability has traditionally been a critical metric for evaluating a company's performance, long-term survival, and development. To remain competitive and promote long-term prosperity, every company must be profitable. Selling goods or services can help a firm accomplish its primary profit goal. The profit created by a corporation is proportional to the volume of goods and services sold (Nasution, 2020). Other factors may also affect a company's Profitability. "The effects of liquidity, asset management, and debt on operating performance will be visible in profitability" (Umoh, Harcourt & Amah, 2013). The company's profitability results from various policies and actions that optimize operational activities, of which production planning policy is critical.

Production Planning is the lifeblood of any manufacturing company. It requires maintaining a delicate balance between customer satisfaction and supplier management. Production planning attempts to maximize the efficiency and effectiveness of production resources while fulfilling product demand and accounting for all relevant variables that affect the manufacturing environment (Jadayil, Khraisat, & Shakoor, 2017). During production planning, targets and resource allocations are determined.

Production planning is becoming one of the most important aspects of a company's operations that should be embraced by every business, no matter how big or little. It is a method or procedure for converting a set of inputs, such as men, materials, capital, information, and energy, into a specified set of outputs, such as finished goods and services, in the right amount and quality to meet an organization's goals (Umoh, Harcourt & Amah, 2013). It is a sequential production function that ensures strategic raw materials (materials, men, money, and machine) are accessible at the correct time and in the right quantity to produce

finished products according to the schedule. It is a managerial function that determines the production facility requirements based on space availability and market demands (Turnovsky, 1970).

The primary goal of production planning is to guarantee that departments within an organization work together to eliminate obstacles in the manufacturing process. Production planning helps an organization determine workforce, material, and equipment requirements, schedule production according to marketing demand, secure diverse inputs at the correct time and in the right quantity and make the most efficient use of production inputs (Sharma, 2017).

This study aims to investigate the effect of production planning on the Profitability of listed FMCG companies in Nigeria. However, the specific objectives are to:

1. examine the effect of inventory turnover on the Profitability of listed FMCG companies in Nigeria;
2. assess the influence of workforce productivity on the Profitability of listed FMCG companies in Nigeria; and
3. evaluate the effect of capital structure on the Profitability of listed FMCG companies in Nigeria

Literature Review

Production Planning

The art of scientifically analyzing production activities started with Adam Smith. He argued that productivity increases when the production process is divided into specializations and repetitive tasks are automated (Smith, 1976). Other management researchers expanded the work of Adam Smith to produce a scientific management approach that identifies other factors such as job analysis, workers' training, and environmental aspect. With increasing pressure to reduce the cost of operation and be more competitive, companies emphasize optimizing their processes through knowledge management and skills enhancement (Battistoni, Bonacelli, Colladon, & Schiraldi, 2013).

Production planning is, therefore, critical to increasing enterprise productivity. Production is the making of goods and services for consumption. Production starts with labor, capital, material, and management as inputs which pass through a conversion process to become the final output of goods and services. Productivity can be measured as a single factor where one resource is used as input. However, production activities often involve many resources as input; thus, a multifactor approach to productivity measurement is more appropriate (Heizer, Render & Munson, 2019).

"Production planning involves the sequence of activities performed before the production process. These include a production schedule, economic batch quantities, dispatch of priorities, and operation sequence. On the other hand, production control ensures the implementation of all production plans" (Ovunda, Isaac & Vurasi, 2019). Production planning is a management strategy that manufacturing organizations use to ensure that resources are allocated and coordinated in a manner that results in operational efficiency. In an environment where consumer demand is fluid and production resources are scarce, management must oversee all production elements (Biswas & Baral, 2021).

The purpose of planning and controlling all the activities involved in making a product is to improve productivity. Production Planning establishes efficient use of materials, money, machine, and manpower to enhance the organization's Profitability. The impact of Production Planning is improved organization for regular and timely delivery, better suppliers' communication for raw materials procurement, reduced investment in inventory, reduced production cost by increasing efficiency, smooth flow of all production processes, reduced waste of resources and production cost savings that improve the bottom line.

The critical decisions in Production Planning are what to produce, how to produce, where to produce when to produce, who will produce, and how much to produce. All these decisions are spread across different functions in an organization. Production planning forms the central nervous system of a manufacturing organization that interconnects all other functions.

Profitability

Profitability is a metric that quantifies how much money a company makes and how much money it spends. The ability of a corporation to produce a profit from sales, total assets, and own capital are referred to as Profitability. Profitability results from various policies and decisions (Brigham & Houston, 2009). The profitability ratio depicts a company's ability to make a profit using all available capabilities and resources, including sales activities, cash, capital, number of employees, number of branches, and so on (Kieso, Weygandt & Warfield, 2018). Further, a company's Profitability depicts its ability to profit for a certain period at a given rate of sales, assets, and capital stock (Margaretha & Supartika, 2016). Profitability ratios show how well a company's management generates profits from sales, total assets, and, most importantly, stockholders' money (Batchimeg, 2017).

To compete, a company must create more revenue and maximize profits. Much research on Profitability has shown that high rates of business performance do contribute efficiently to income production and overall economic development. The following are examples of profitability ratios. The gross profit margin is the percentage of each sales dollar that remains after the company has paid for its items (Gitman, 2015). Gross margin determines cost policies and tells how much can be spent on operating expenses while maintaining acceptable bottom-line Profitability (Weston & Copeland, 1992). Because sales can generate profit, the gross profit margin is calculated based on net sales (Innocent, Okwo & Ordu, 2013). After deducting COGS from your income, your gross profit is the amount of profit you make.

After subtracting the expenditures related to your core operational activity, you may calculate how much profit you made on the margin by dividing Gross Profit by Revenue (Berk & DeMarzo, 2011). It's also heavily influenced by sales, which DSO and DPO influence.

Furthermore, the emphasis on assets will be avoided by contrasting with the sales level. One issue with this metric is determining the COGS, which is challenging because not all companies in our sample have provided it. In the practical method chapter, there will be more explanations of how it was computed and a more in-depth discussion of why GPM was chosen as the dependent variable.

This ratio is used to assess a company's ability to generate net income (profit) from its main operating activities. The better the operation of a business, the bigger the net profit margin. Understanding Return on Asset (ROA) measures management's total performance in generating profits with available assets (Le & Phan, 2017). The return on Assets (ROA) ratio measures a company's success in managing its wealth (assets). As the Return on Assets (ROA) ratio rises, it reflects its performance in managing assets held, allowing it to create profits or earnings.

According to a past study, there appears to be a pattern in which ROA is frequently used (Bettis, 1981). The return on assets (ROA) is an excellent metric to indicate returns directly managed by management (Simerly & Li, 2000). The study further added that ROA is widely utilized by managers and other stakeholders and is frequently connected with other metrics like ROE (Badera, Budiasih, & Devi, 2017). Furthermore, incorporating ROA is just as important as eliminating ROE because the latter ignores the influence of certain types of resource investment. Also, a high ROE may merely suggest a deeply leveraged company, while a low ROE may indicate the inverse. As a result, it is recommended that ROA and ROI are better appropriate for capturing enterprises' contributions to broader resource investments. The strength of ROA is

that it is less sensitive to leverage than ROE. On the other hand, ROA is more sensitive to fluctuations in working capital (Badera, Budiasih, & Devi, 2017).

The ratio of net profit after taxes to total equity is known as return on equity. Return on equity (ROE) is a measure of the earnings (income) available to the company's owners (including common and preferential shareholders) on the capital they invested (Heitger, Mowen, & Hansen,2012). Earnings per share (EPS) is a ratio that shows how much a company's ability to generate earnings per share is worth (Fernando & Kindness, 2021). The ratio that describes the amount of rupiah gained for each share of common stock is called earnings per share. As a result, earnings per share are important to common and potential shareholders in general corporate management.

Theoretical Framework

The theory of constraint formed the theoretical background for this study. The theory comprises operations strategy, performance measurement, and logical thinking. It states that every production process will have at least one constraint that limits production efficiency, impacting the organization's performance (Goldratt & Cox, 2004). The theory holds three key assumptions on organizational performance measurement based on throughput, inventory, and operational expense.

Some critics claimed that the theoretical approach to establishing an optimal product mix is unlikely to yield optimum results (Alexandre, 2009). Another criticism of the theory is its derivation from system dynamics and statistical process control. Some critics also considered the theory to have not proven its effectiveness in the academic literature for wide acceptance and failure to empower employees in the production process and address the unsuccessful policies as constraints. More case studies are necessary to show the connection between implementation and improved financial performance (Mahesh & Snyder, 2009).

In contrast, supporters of the theory stated that much of the criticism of constraint theory has been focused on the lack of rigor and not on the bottleneck approach. Modern management thinking sees a broader application of the theory in production, logistics, distribution, research and development, and other fields. The theory is relevant in studying production planning and the performance of an organization because it considers the economic imperative, which determines the ability of a company to generate enough profit, and the management imperatives, which provide operational methods to achieve the goal.

Review of Empirical Studies

Essien, Iniabasi & Ekpo (2021) studied the effect of inventory control techniques on the Profitability of manufacturing firms using one of the FMCG companies in Nigeria as a case study. The study focused on the techniques used in managing and controlling inventories and the effect on the Profitability of manufacturing firms in Nigeria, with a special focus on Champion Breweries Plc. Uyo, Akwa Ibom State. Nigeria. The study used a mixed method. The primary data was collected through a questionnaire, and secondary data was extracted from the financial performance report for 4 years. The result showed that the stock valuation method used and inventory cost management of the company has a direct impact on Profitability. However, the company studied was not using the Just in Time method of inventory control. The use of a computerized inventory control method would improve the company's Profitability.

Asaolu (2021) explored the influence of capital structure on the performance of the Oil & Gas, and Manufacturing sectors in the United States and the disparities in their dynamics. The study used secondary data from the New York Stock Exchange (NYSE)/NASDAQ for ten years, from 2010 to 2019. The inquiry used the panel least square estimation approach and sectoral analysis of the data acquired to evaluate the specified hypotheses. The findings demonstrate that debt structure enhanced business performance, a significant rise in such leverage tends to lower firm performance for all of the firms studied. However, this study focused on a developed market, which cannot be generalized for emerging economies. A study on Nigeria's FMCGs firms may yield a different outcome.

Althaqafi (2020) conducted a study on the effect of inventory management on financial performance with evidence from a Saudi manufacturing company. The study shows a relationship between inventory management and financial performance. The study made a distinction between inventory control and inventory management. Inventory control is seen from the actual stock tracking, recording, and reconciliation, while inventory management focuses more on management and reporting. However, the study identified inconsistencies in inventory records and management that impact negatively on the Profitability of the company. These inconsistencies were identified in scheduled cycle count activity, inadequate staff monitoring and supervision, misplaced or stolen stocks, and inefficient communication approach in inventory management. The study recommended a structural approach to managing inventory. Detailed responsibilities and procedures should be developed for managing inventory and the process of stock counting to be cross-functional for accurate record updates.

Ahmad and Zabri (2018) studied mediating effect of knowledge of inventory management and performance, and a strong correlation was observed between inventory management knowledge and the performance of micro-enterprises. The size of an enterprise was also a significant factor in adopting inventory management practices. It was observed that a gap in the knowledge of inventory practices in micro-enterprises limits the growth and performance of such an enterprise. The research was limited to micro-enterprises in Malaysia. It is, however, worthwhile to explore inventory management practices in FMCG companies in Nigeria. The knowledge of inventory management practices is essential for performance. This will guide management in setting the right policy for managing inventory based on the company's production characteristics and strategic plan.

Ikon and Nwankwo (2016) assessed the production planning and Profitability of selected manufacturing enterprises in Nigeria. The research used "flour Mill of Nigeria Plc, Dangote Flour Mill Plc, and Honeywell Flour Mill Plc" as case studies. According to the report, Production Planning is critical for supplying clients with better and more cost-effective goods for a smaller expenditure. The data was analyzed using the Ordinary Least Square (OLS) technique with time series. The study's findings suggest that the estimated coefficient of the constant term for the firms is significant. They concluded that turnover (sales) leads to an increase in inventory, which raises production. Although this study used FMCGs firms, a sample of three firms is too small to generalize to all FMCGs in Nigeria. For generalization, a higher sample size is needed.

Kritchanchai and Meesamut (2015) examined inventory management in hospitals, and it was observed that hospital management uses a single inventory policy for all drugs. This has led to increasing costs on storage, obsolesce, and attendant budget increase. Based on historical records, the research focused on studying high consumption values and classified them by drug characteristics, demand value, and clinical importance. It was discovered that a single inventory policy is inadequate for all medicine based on their category and demand characteristics·

Methodology

The study employed an *ex-post facto* research design to explain the relationship between Production Planning and Profitability of Selected Fast-Moving Consumer Goods Companies in Nigeria. The population comprises twenty-one (21) consumer goods firms listed on the Nigerian Stock Exchange floor as of 31st December 2020. A purposive sampling technique was used to determine the sample population. The study selected eight (8) FMCGs in Nigeria based on two filter criteria. The first criteria are firms with declining or inconsistent Profitability, and the second criteria are firms with published annual reports from 2011 to 2020. The research used secondary data from the audited annual report of the firms from 2011 to 2020. Data was collected for the sampled company from the audited reports published by the Nigerian Stock Exchange from 2011 to 2020. The descriptive and inferential analysis, as well as multiple regression techniques and the STATA13 package, were used for the analysis.

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue I January 2023

Model Specification

PROF= f (INVT)

PROF = f (WKFZ)

PROF = f (CASTR)

PROF = f (INVT, WKFZ, CASTR)

Mathematical Model

Y = f (X)

Y = Profitability (PROF)

X = Production Planning (PP)

$X = f (x_1, x_2, x_3, m)$

$X = x_1, + x_2, + x_3, + m$

Where:

x_1 = Inventory Turnover (INVT)

x_2 = Workforce Productivity (WKFZ)

x_3 = Capital Structure (CASTR)

f = functional dependency of the relationship

m = Random Variable (error term)

Therefore $Y = f (x_1, x_2, x_3, x_4, m)$

$Y = f (x_1, + x_2, + x_3, + m)$

PROF = f (INVT + WKFZ + CASTR)

Data Analysis and Presentation

Table 1: Descriptive Statistic

Variables	Obs	Mean	Std dev.	Min	Max
PROF	80	0.068	.091	-.197	.265
INVT	80	5.684	4.249	0.575	38.598
WKFP (000)	80	74012.34	45049.42	8971.583	244750.2
LWKFP	80	11.022	0.654	9.10	12.41
CASTR	80	2.09	5.54	-4.487	47.923
INF	80	12.01	2.96	8.06	16.52

Source: Field Survey, 2022

Table 1 shows a detailed account of the descriptive analysis of the variables. The profitability variable reveals a mean value of 6.8% and a standard deviation of 9.1%. The positive value for the mean of 0.068 indicates that the selected FMCGs in Nigeria efficiently generate profit from operations. The standard deviation suggests that the sampled firms have similar trends in profit generation. However, the wide dispersion of the individual PROF from the mean indicated variance in their Profitability. The table further reveals that PROF has a minimum loss return on assets of -19.7% and the highest recorded PROF of 26.5%.

The results from the analysis presented in Table 1 revealed that inventory turnover has a mean value of 5.68 and a standard deviation of 4.249, respectively. The average value shows that the inventory turnover ratio for the selected FMCGs in Nigeria for ten years ranging from 2011 to 2020 is 5.68times. This suggests that the selected firms, on average, will sell and replenish their inventory roughly every one or two months. This indicates that they are efficient in controlling their inventory. Further, the standard deviation of 4.249 reveals a common trend among the selected FMCGS firms as it shows a low variation from the mean. The lowest and the highest value is 0.575 and 38.595, respectively.

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue I January 2023

As presented in Table 1, the analysis of workforce productivity reveals an average value of N74million, which discloses that the ratio of the firm revenue to the employee is ₦74 million. This is the revenue that the sample firms' employees, on average, can generate during the study period. The standard deviation is approximately an N45million, which reveals that all the firms have a similar pattern of money each employee generates for their firms. Hence, their workforce productivity is identical across the firms during the study period. The minimum and the maximum value of WKFP are approximately N9million and ₦244.8 million, respectively. The natural logarithm of the ratio (LWKFP) reveals a mean value of 11.02, a standard deviation of 0.65, and minimum and maximum values of 9.10 and 12.41, respectively.

Table 1 also discloses that capital structure measured by total debt to total equity ratio has an average value of 2.09 and a standard deviation of 5.54, indicating wide fluctuation in the data from their mean. The mean value suggests that, on average, the debt in the firms is two (2) times their equity, which means that the firms have more debt in their capital structure. The table also reveals that the least value of CASTR is -4.487, and the maximum value is 47.923. the least value of -4.487 suggests a severe debt issue in some firms, implying that their total assets cannot cover their debt. The range (52.910) corroborates the wide dispersion revealed by the average value.

Finally, Table 1 reveals that the macroeconomic control variable inflation has an average value of 12.01 % and a standard deviation of 2.96%. The average value implies that, on average, during the study, the inflation rate in Nigeria is 12.01%. The table also reveals a minimum and maximum value of 8.06 and 16.52%, respectively.

The correlation matrix is used to reveal the association between every two sets of variables in the regression model. Any variables with a less than 0.80 correlation coefficient are considered less harmful and can be incorporated into the same regression model since there is no interdependency among the independent variables (Gujarati, 2004). Also, it is expected that there should be a strong association between the dependent and independent variables.

Table 2: Correlation Analysis

Variable	PROF	INVT	WKFZ	CASTR	FSZ
PROF	1.000				
INVT	0.068	1.000			
WKFP	0.514	- 0.259	1.000		
CASTR	-0.055	- 0.027	0.113	1.000	
INF	-0.177	0-.363	0.178	0.035	1.000

Source: Field Survey, 2022

Table 2 reveals the relationship between the dependent variables (PROF) and independent variables with their respective correlation coefficient. The correlation matrix table revealed that the correlation coefficient between PROF and inventory turnover is 0.068. The result suggests that inventory turnover has a positive and low correlation with the Profitability of the selected listed FMCGs firms in Nigeria. The positive correlation is an indication that any increase in the inventory turnover of the sampled listed firms will increase Profitability.

Furthermore, Table 2 reveals that the correlation coefficient between PROF and WKFP is 0.514. The result suggests that workforce productivity has a positive and moderate relationship with Profitability. This indicates that increased workforce productivity will improve the Profitability of the selected listed FMCGs firms in Nigeria.

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue I January 2023

In addition, Table 2 reveals a negative and weak coefficient of -0.055 between capital structure and Profitability. This means the capital structure (CASTR) has a negative and weak correlation with the Profitability of the selected FMCGs firms in Nigeria.

Furthermore, the correlation value between inflation and Profitability revealed a value of -0.177. The result suggests that inflation has a negative and weak correlation with the Profitability of the selected listed FMCGs firms in Nigeria. The negative correlation shows that an increase in the sampled listed firms' inflation will decrease Profitability. On the relationship among the independent variables, Table 2 shows that the independent variable among themselves display a weak connection. The highest correlation is between inventory turnover and inflation, with a correlation coefficient of -0.363, which is still below the benchmark of (+-) 0.80, suggesting that the independent variables have no multicollinearity (Gujarati, 2004). This will further be supported by the regression multicollinearity test conducted using variance inflation factors and tolerance value.

Robustness tests are carried out to test the validity of the statistical inference of a linear regression model. The robustness tests conducted for this study include the model specification test, normality of residual, multicollinearity test, and heteroskedasticity test. However, the Hausman specification test was conducted to test the existence of the panel effect and the preferred model selection.

Table 3: Normality Test of Data

MODEL	**Variables**	**Obs**	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	**Prob>chi2**
PROF	Residual	143	0.638	0.473	0.75	0.687

Source: Field Survey, 2022

One of the assumptions of classical ordinary least square regression is the assumption of normality residual. The test's null hypothesis is that the residual is normal at a 5% significance level. The Jacque Bera test reveals a P-value of 0.687, greater than 5%, indicating that the residual is normally distributed.

Table 4: Multicollinearity Test

Variables	VIF	Tolerance Value
INVT	1.21	0.829
WKFP	1.09	0.913
CASTR	1.01	0.987
FS	1.16	0.860
Mean VIF	1.12	

Source: Field Survey, 2022

The classical assumption of the OLS regression model assumes the explanatory variables are not perfectly correlated (absence of multicollinearity). Tolerance less than 0.1 and the VIF value 10 and above imply the presence of multicollinearity in the estimates[1]. However, the results from Table 4.4 below evidence that there is no existence of excessive correlation among the independent variables because the least tolerance value (TV) is 0.829 while the maximum variance inflation factor (VIF) is 1.21

Table 5: Heteroskedasticity Test

Test	**Chi2**	**P-value**
Breusch- Pagan or cook – Weisberg to test	0.12	0.725

Source: Field Survey, 2022

Another assumption of classical ordinary least squares is the homoskedasticity of the residual. The null hypothesis is that the variance of error terms is similar across the values of the independent variables. For this study, a heteroskedasticity test was carried out using Breusch- Pagan/Cook-Weisberg test. The null hypothesis is that the data is homoscedastic, conducted at a 5% significance level. The Breusch- pagan / Cook-Weisberg test in Table 5 shows that the chi2 value is 0.12 and the p-value of chi2 is 0.725, which is not significant as the P-value exceeds 5% indicating that there is no issue of heteroskedasticity. Thus, the residual is homoskedasticity, and the assumption is satisfied.

Table 6: Hausman Specification Test

Test	Chi2	P-Value
Hausman Specification Test	3.06	0.548

Source: Field Survey, 2022

Due to the panel nature of the data, the study conducted the Hausman Specification Test to determine if the panel effect is random or fixed. The result shows that at a 5% level of significance, the chi^2 is 3.06 and the prob>chi^2 is 0.548, which is not significant at less than the 5% level. The significant p-value shows that the Hausman test favors the random effect model. Hence, the study conducts a panel test.

Table 7: Panel Effect Test

Test	Chi2	P-value
Breusch and Pagan Lagrangian multiplier test for random effects	41.38	0.000

Source: Field Survey, 2022

The Breusch and Pagan Lagrangian multiplier test for random effects was carried out on the null hypothesis, and the result shows no panel effect. Table 4.7 discloses a chi-square of 41.28 and a significant P-value of 0.000 (less than a 5% level of significance). This indicates that there is a panel effect. The study selects random effect regression as an ideal model for interpretation. In other to improve the robustness of the inferences, the study adopts a more robust random effect regression model (with Discrol-Kraay standard error).

In this section, the regression results of production planning and Profitability are presented and analyzed below:

Table 8: Robust Random Effect Regression Model

Variables	Coefficients	Robust Standard error	T-statistic	P>T
INVT	0.013	.006	2.30	0.047*
WKFP	0.056	.021	2.72	0.026*
CASTR	-0.003	.000	-6.43	0.000*
INF	-0.007	0.003	-2.38	0.041*
CONST	0.855	0.201	-2.42	0.039*
F-STAT	320.99			0.000
R^2 Within	34.39			

Source: Field Survey, 2022

Table 8 presents the random effect regression result selected for the study based on the Hausman and LM tests. The R^2 overall reveals a value of 34.39%, indicating that the production planning variables and the control variable inflation can explain the variations in the Profitability of the selected FMCGs firms in Nigeria to a percentage of 34.39%, while the remaining percentage is explained by other factors not captured in the model. The F-Stat chi-square of the robust model is 320.99 with a P-value of 0.000, which reveals that the model is fitted at a 5% significant level and the variables have a joint effect on theProfitability of the selected listed FMCGs in Nigeria.

Discussion of Findings

Objective one of this study examines the effect of inventory turnover on the return on assets to measure the Profitability of listed FMCG companies in Nigeria. The data analyzed in this study indicates that inventory turnover has a positive and significant effect on the return on asset ROA of selected FMCGs in Nigeria. This is evidenced by the coefficient of .013 and the P-value of 0.047. This implies that an increase in inventory turnover will enhance Profitability. It suggests that a one-unit increase in inventory turnover will lead to a 0.013 increase in the firms' Profitability measured by ROA. Thus, the firms' efficient management of inventory levels will increase Profitability. Maintaining high inventory turnover is beneficial to improving the firm's Profitability. When firms manage their inventory efficiently, it is quickly converted into products and sold. This higher turnover earns the company a higher profit. Proper planning of inventory management is therefore essential to the Profitability of FMCGs in Nigeria. The finding is in line with the theory of constraint, which explains that a company maximizes Profitability by increasing the throughput while reducing inventory and operating expenses. Further, the finding supports the prior studies that found inventory turnover to be advantageous to improving the company's Profitability (Gujarati, 2004; Lee, Zhou & Hsu, 2014). It is pointed out that Inventory control management benefits firms by facilitating material storage and retrieval, improving sales effectiveness, and lowering operating costs thereby enhancing Profitability (Ogbo, Onekanma & Wilfred, 2014). However, it is contrary to the finding by some prior extant literature that discovered that inventory turnover negatively influences Profitability (Ahmadi, Arasi & Garajafary, 2012; Ganas & Hyz, 2015).

The second objective of this study investigates the extent to which workforce productivity affects the net profit of listed FMCG companies in Nigeria. The findings revealed that increasing workforce productivity improves the Profitability of the selected FMCG firms in Nigeria. The analysis presented in this study shows that workforce productivity has a positive coefficient of 0.056 and a P-value of 0.026, significant at a 5% significance level. The finding implies that any increase in workforce productivity will increase the Profitability of the sampled firms by 0.056. this means that higher workforce productivity improves the Profitability of the listed selected FMCGs in Nigeria. This positive consequence implies that when employees are productive, they either do more work in less time or work for fewer hours—this aids in reducing operating costs. As a result, smaller labor is required to provide the same output, increasing Profitability. This result is in line with prior studies' theory of constraint. It also corroborates the studies that found that workforce productivity enhances the Profitability of firms (Obisi, Samuel, & Ilesanmi, 2020). However, the finding contradicts the study that discovered that employee size has an inverse effect on performance (Becker-Blease, Kaen, Etebari & Baumann, 2010).

Objective three of this study enquires how capital structure impacts the return on assets of listed FMCG companies in Nigeria. The results show that capital structure measured by total debt to equity is negative and significant, influencing the Profitability of selected listed FMCGs in firms in the Nigeria Stock Exchange during the period under review. This is evidenced by the sign of the coefficient, which is -0.003, and the p-value 0f 0.000, which is significant at a 5% significance level. This further revealed that an increase in the debt in the capital structure would affect Profitability negatively. This, by implication, suggests that higher debt in the capital structure would likely decrease the firms' earnings due to additional

interest expense incurred on debt. This result is consistent with the pecking order theory, which specifies that a negative relationship exists between debt and Profitability. A firm does not need to depend much on external finance. Also, the findings are in line with the prior studies that found that an increase in debt in the capital structure would cause a decline in the firms' Profitability (Adeoye & Olojede, 2019; Asaolu, 2021). However, some prior studies contradict the pecking order theory with evidence that capital structure enhances the Profitability of the firms

Conclusion and Recommendations

This study investigates the effect of production planning on the Profitability of listed FMCG companies in Nigeria. Profitability growth is essential to the long-term survival of any organization. It is a key metric that management and stakeholders evaluate to ensure the value of assets is not eroded over time. After a careful review of the results, discussion, and relevant literature, the study discovered that inventory turnover enhances the Profitability of listed FMCGs in Nigeria. Hence. It concludes that inventory management, as indicated by inventory turnover, improves the Profitability of listed FMCGs in Nigeria.

Further, the study found that workforce productivity positively affects Profitability. Thus, it concluded that improved workforce productivity enhances the Profitability of listed FMCGs in Nigeria. Finally, the study concludes that capital structure with higher total debt to total equity will negatively influence the Profitability of listed FMCGs in Nigeria due to the cost of debt servicing and the inflationary effect.

However, the study gave the following recommendations:

1. FMCG companies' management in Nigeria should focus on strategic inventory management to improve operations efficiency and turnover. Methods such as lean manufacturing, economic order quantity, and total quality management should be adopted in inventory management. Accuracy of demand forecast and aggregate planning is essential and should be made visible to the management.
2. There is a need to improve workers' productivity through proper incentive mechanisms, a good working environment, technology use, and continuous manpower training and planning.
3. Managers of the listed selected FMCGs in Nigeria should develop measures to strike a balance between debt and equity finance and seek debts with better interest costs to Improve Profitability.
4. Government and policymakers should create an enabling environment and sovereign fund accessible by manufacturing companies at single-digit interest rates to improve their working capital and enable their growth.

Reference

1. Adeoye, S. D., & Olojede, S. O. (2019). Effect of capital structure on financial performance of listed banks in Nigeria. *Asian Journal of Economics, Business and Accounting*, 12(2), 1-14
2. Ahmad, K. & Zabri, S. M. (2018). The mediating effect of knowledge of inventory management in the relationship between inventory management practices and performance: The case of micro retailing enterprises. *Journal of Business and Retail Management Research (JBRMR)*. 12(2), 83- 93.
3. Ahmadi, M., Arasi, I. S. & Garajafary. M. (2012). Studying the relationship between working capital management and Profitability at Tehran Stock Exchange: A case study of food industry. *Research Journal of Applied Sciences, Engineering and Technology* 4(13), 1868-1874
4. Alexandre, L. (2009). Theory of constraints and the combinatorial complexity of the product-mix decision. *International Journal of Production Economics*, 121(1), 121-129.
5. Asaolu, A. A. (2021). Capital structure and firm performance: A comparative study of oil and gas and manufacturing sectors in the United States of America. *Business and Management Studies, Redfame Publishing*, 7(1), 29-44

6. Badera, I. D. N., Budiasih, I. G. N. & Devi, S. (2017). The influence of enterprise risk management disclosures and intellectual capital disclosures against corporate values. *Journal of Accounting and Finance Indonesia*, 14(1),20-45.
7. Batchimeg, B. (2017). Financial performance determinants of organizations: the case of Mongolian companies. *Journal of Competitiveness*, 9(3), 22-33.
8. Battistoni, E., Bonacelli, A., Colladon, A. F. & Schiraldi, M. M. (2013). An analysis of the effect of operations management practices on performance. *International Journal of Engineering Business Management*, 5, 1-11.
9. Becker-Blease, J. R., Kaen, F. R., Etebari, A., Baumann, H. (2010). Firm size and Profitability in U.S. manufacturing industries. *Investment, Management and Financial Innovations*, 7(2), 7-23.
10. Berk, J. & DeMarzo, P. (2011). *Corporate finance*, 2nd edition. Boston, Massachusetts: Pearson Education, Inc.
11. Bettis, R. A. (1981). Performance differences in related and unrelated diversified firms. *Strategic Management Journal*, 2(4), 379-393.
12. Bhandalkar, S. (2019). Global FMCG market by type and distribution channel: opportunity analysis and industry forecast, 2018 – 2025. Allied Market Research. Retrieved from https://www.alliedmarketresearch.com/press-release/fmcg-market.html
13. Biswas, T. & Baral, R. N. (2021). A review on production planning and control. *International Journal of Multidisciplinary Innovative Research*, 1(1), 70-78.
14. Brigham, E. F. & Houston, J. F. (2009). *Fundamentals of financial management*, 12th edition, Houston: South-Western Cengage Learning.
15. Fernando, J. & Kindness, D. (2021). Earnings Per Share (EPS). Investopedia, Retrieved from https://www.investopedia.com/terms/e/eps.asp
16. Ganas, I. & Hyz, A. (2015). Inventory management and firm's performance during the period of financial constraints: An empirical analysis of SME sector in Greece. *The European Business and Management Conference 2015, Brighton, United Kingdom Official Conference Proceedings*, 31-51.
17. Gitman, L. J. (2015). *Principles of managerial finance*. Boston: Pearson Education International, 1-592.
18. Goldratt, E. M. & Cox, J. (2004). *The goal, a process of ongoing improvement*, 3rd ed. Great Barrington, MA: The North River Press Publishing Corporation
19. Gujarati, D. N. (2004). *Basic econometrics*, 4th edition, USA: McGraw- Hills, 320 – 365
20. Heitger, L. D., Mowen, M. M. & Hansen, D. R. (2012). *Cornerstones of managerial accounting loose leaf*. Boston: Cengage Learning.
21. Heizer, J., Render, B. & Munson, C. (2019). *Operations management: Sustainability and supply chain management*, 13th ed. Upper Saddle River, New Jersey: Pearson Education Inc.
22. Ikon, M. A. & Nwankwo, C. N. (2016). Production planning and Profitability of selected manufacturing firms in Nigeria. *International Journal of Business and Management Review*, 4(1), 11-32.
23. Innocent, E. C., Okwo, I. M. & Ordu, M. M. (2013). Financial ratio analysis as a determinant of Profitability in Nigerian pharmaceutical industry. *International Journal of Business and Management*, 8(8), 107-171.
24. Jadayil, W.A., Khraisat, W. & Shakoor, M. (2017). different strategies to improve the production to reach the optimum capacity in plastic company. *Cogent Engineering*, 4(1), 1389831.
25. Kieso, D. E., Weygandt, J. J. & Warfield, T. D. (2018). *Intermediate accounting*, 16th ed., New York: John Wiley & Sons.
26. KPMG. (2016). Fast Moving Consumer Goods Sector Report. Retrieved from: https://assets.kpmg/content/dam/kpmg/br/pdf/2016/09/fast-moving-consumer-goods.pdf
27. Le. T. P. V. & Phan, T. B. N. (2017). Capital structure and firm performance: Empirical evidence from a small transition country. *Research in International Business and Finance*, 42, 710-726.

28. Lee, H. H., Zhou, J. & Hsu, P. (2014). The role of innovation in inventory turnover performance *Decision Support Systems*, 76, 35-44
29. Mahesh, G. & Snyder, D. (2009). Comparing TOC with MRP and JIT: A literature review. *International Journal of Production Research*, 47(13), 3705-3739.

    Margaretha, F. & Supartika, N. (2016). Factors affecting Profitability of small medium enterprises (SMEs) firm listed in Indonesia stock exchange. *Journal of Economics, Business and Management*, 4(2), 132-137.
30. Matopoulos, A., Ranitovic, R. & Bourlakis, M. (2012). Exploring demand and production planning challenges in the food processing industry: A case study. Paper prepared for presentation at the 127th EAAE Seminar – 10th Wageningen International Conference on Chain and Network Management, May 23-25, 2012, Wageningen, The Netherlands
31. Nasution, A. A. (2020). Effect of inventory turnover on the level of Profitability. IOP Conference. Service Material Science and Engineering. 725 0121. Retrieved from https://iopscience.iop.org/article/10.1088/1757-899X/725/1/012137
32. National Bureau of Statistics, (2020) *The quarterly newsletter of national bureau of statistics*. Bumper Edition, 1(2) 33-34.
33. Obisi, C., Samuel, R. & Ilesanmi, A. (2020). Influence of workforce planning on organizational performance in the manufacturing industry of Lagos, Nigeria. *Global Business Review,* 21(2), 404–17.
34. Ogbo, A. I., Onekanma, I. V. & Wilfred, I. U. (2014). The impact of effective inventory control management on organizational performance: A study of 7up Bottling Company, Nile Mile Enugu, Nigeria. *Mediterranean Journal of Social Sciences,* 5(10), 109-118
35. Ovunda, M. N, Isaac, O. E. & Vurasi, N. M. (2019). Assessment of the impact of production planning and operational cost control in the beverage industries. *American Journal of Engineering Research*, 8(1), 63-81.
36. Sharma, H. (2017). An Overview of Production Systems and Production Planning and Control. Amity University Haryana. Retrieved from http://ddegjust.ac.in/2017/Uploads/11/POM-326.pdf
37. Simerly, R. L. & Li, M. (2000). Environmental dynamism, capital structure and performance: A theoretical integration and an empirical test. *Strategic Management Journal*, 21(1), 31-49.
38. Smith, A. (1976). *The Wealth of Nations*, ed., Campbell, R. H. Skinner, A. S. and Todd W. B. Oxford: Clarendon Press.
39. Turnovsky S. J. (1970). Financial structure and the theory of production. *The Journal of Finance*, 25(5), 1061-1080.
40. Umoh, G. I., Harcourt, I. & Amah, W. (2013). Production planning and corporate productivity performance in the Nigerian manufacturing industry," *IOSR Journal of Business and Management*, 14(22), 1-7.
41. van Elzakker, M. A. H., Zondervan, E., Raikar, N.B., Grossmann, I. E. & Bongers, P. M. M. (2014). Tactical planning in the fast-moving consumer goods industry: An SKU decomposition algorithm. *Computer and Chemical Engineering*, 62, 80-95.
42. Weston, J. F. & Copeland, T. E. (2992). *Managerial finance*, 9th ed. United States: The Dryden Press International Edition.