

## **Production Planning and Corporate Productivity Performance in the Nigerian Manufacturing Industry**

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**Abstract:** *Production Planning has existed in the Nigerian manufacturing industry over the years but has failed to deliver the promised goods of accelerated development of the economy. This paper investigates the relationship between Production Planning and Corporate Productivity Performance of the Nigerian manufacturing industry. In this respect Corporate Productivity Performance is measured in the areas of cost minimization, enhanced equity capital and growth. Three hypotheses were formulated and questionnaire were distributed to eighty respondents in the eighty sampled manufacturing firms from the one hundred in the industry, quoted in the Stock Exchange (Fact Book 2009). Sixty two copies of the questionnaire were retrieved. These with the financial statements of the firms for a period of five years, were used for the analysis. From its findings, the study revealed that production planning has significant impacts on operational efficiency, enhanced equity capital and growth of Nigerian manufacturing industry. This finding implies that production Planning significantly affects the Corporate Productivity Performance of firms. Based on these, the study recommends among others, that the Nigerian manufacturing industry should review their production planning concepts and implementation, in order to restore the industry as the base of all development.*

**Keywords:** *Production Planning, Corporate Productivity Performance.*

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### **I. Introduction**

In the wake of 2008, the world experienced a depression which led to the global economic meltdown. As stated by Eleanya (2009), the European, American and Asian States did not just relax and watch the meltdown wreck the economy. He explained further that even in West Africa, a country like Ghana with her very limited resources did not relax in the face of the meltdown. Every little effort put forward by these countries to revamp their manufacturing sectors yielded fantastic result, either by the public, private or both sectors. The reverse is the case in Nigeria, where huge amount of the peoples' resources have been pumped into the manufacturing sector and no visible result is recorded. Instead the sector is seriously declining.

Jain and Aggarwal (2008) state that, every manufacturing activity requires resource input in terms of men, materials, money and machines. They went further to state that in any business that produces a product or service production activity must be related to market demands as indicated by the continuous stream of customers' orders. It follows therefore that for maximum effectiveness, this must be done in such a way that customers' demands are satisfied, but at the same time production activities are carried on in an economic manner. The process of developing this kind of relationship between market demands and production capability is the function of production planning (**PP**) which has been described as the predetermination of manufacturing requirements of such things as available basic materials, detailed equipments, production runs, order priority, money, man and production process within the scope of the enterprise for efficient production of goods to match its sale requirements. **PP** can be effected principally through the management of workflow, inventories and backlogs, and changing levels of operation (Winston, 2004; Hillier and Lieberman, 2005; Jain and Aggarwal, 2008). Buffa (1975) had maintained that this tool is indispensable in any firm irrespective of size and complexity. Perhaps it is with the understanding and application of this basic tool that advanced countries had contained the global economic crisis that would have ravaged their economies.

Production is a process or procedure developed to transform a set of inputs like men, materials, capital, information and energy into a specified set of output like finished products and services in proper quantity and quality, thus achieving the objectives of an enterprise' (Vollman *et al*, 2007; and Jain and Aggarwal, 2008). The production system likewise is the design process by which elements are transformed into useful products. A process then is an organized procedure for accomplishing the conversion of inputs into output. Production is effective if an appropriate and efficient **PP** technique is in place.

It is the understanding, design and application of this technique that form the focus of this research in the Nigerian manufacturing industry. If the manufacturing sector of the Nigerian economy is seriously declining in its contribution to **GDP**, then there is probably the problem of understanding, design and application of **PP** in

the Nigerian economy-especially in the real sector where manufacturing is predominant. This research looks at existing models and techniques such as linear programming and other mathematical programming models, to find out if they are applied anywhere in the industries under study. The study also sought to establish how suitable such models must have been in the context of the Nigerian economy. It is argued that the existing models could not have been developed with the Nigerian economy in mind, or that our economy lacks proper understanding of such models, thereby being unable to adapt it for application in our environment.

Despite the rich natural, human and capital resources environment, the Nigerian manufacturing sector and indeed the economy is recording a high level of de-industrialization (Eke, 1985; Eleanya, 2002, 2009; Green, 2006). This situation seems to sow the seed for more violent political and social instability. This is because the level of unemployed but employable citizens had continued to: (1) increase exponentially; (2) create a large reserve army of recruitable political thugs and gangsters capable of short changing citizens electorally; (3) generate large number of militants, armed robbers, kidnappers and criminals who will make life nasty, short and brutish for citizens; (4) help to accelerate state failure; and (5) embark on the revolutionary reorganization and reordering of society. If other economies of Europe, America and Asia have developed a robust **PP** mechanisms that could enhance business organisation's goals- corporate productivity performance (**CPP**) of cost minimization, profit maximization, enhanced equity capital and growth, then there is no excuse whatsoever that Nigeria can give for not accomplishing same with her existing human and economic resources (Jain and Aggarwal, 2008).

We have earlier explained that **PP** entails the process of managing workflow, inventories and backlogs, and changing levels of operations to accelerate productivity so that goods and services may find a suitable market (Winston, 2004; Winston and Albright, 2007; Jain and Aggarwal, 2008). Accordingly, the highest efficiency in production is obtained by manufacturing the required quantity of product, of the required quality, at the required time by the best of cheapest method (Bestwick and Lockyer, 2008; Johnson and Montgomery 2009; Wild, 2008; Lockyer, 2009). To attain this objective, management employs **PP** as a tool to coordinate and enhance the performance of all manufacturing activities.

Research evidence in Eleanya (2009) has shown that in Singapore, South Korea, Indonesia, Thailand and Malaysia the manufacturing sector contribution to Gross Domestic Product (**GDP**) is well over sixty percent (60%). These are countries that have through massive industrialization joined the class of world industrialized nations. Indeed, China whose independence is about eleven (11) years older than Nigeria has a manufacturing share of **GDP** as high as eighty percent (80%). As at today manufacturing sector's contribution to **GDP** in Nigeria is less than three percent (3%). This is a problem.

There is therefore need to collectively sustain the pressure and advocacy for friendly business environment, stable macro-economic policies, consistent, clear and focused industrial strategy that will provide support and incentive for manufacturing activities, ensure value addition and job creation, to give the economy the required organizational productivity of profit maximization/cost minimization, and development in general.

Thinking along the reasoning of Fowge (1997), it is our belief that interest in **PP** and corporate productivity performance has spurred curiosity beyond the capacity of scholars to keep pace with it either theoretically or methodologically. This seems to us to be the case in Nigeria as we do not find sufficient evidence of empirical studies on **PP** and its impact on **CPP** in the Nigerian Manufacturing Industry. Empirical studies on **PP** and **CPP** specific-research in Nigeria are scanty (Chinweizu, 1979; Agbadudu, 1996) although Chase *et al* (2001) while acknowledging that the models of **PP** and **CPP** have been developed and tested in western countries, advocates that there is a need for more systematic research to determine whether these models apply elsewhere. It is upon this premise that this study sets out to examine the impact (if any) of **PP** on **CPP** in the Nigerian Manufacturing Industry with a view to enhancing organizational effectiveness and competitive advantage.

## **II. Theoretical Foundation.**

Two key variables formed the focus of this study and they were the Criterion Variable – **CPP** which depends on the Predictor Variable – **PP**. We defined **CPP** as measured by cost minimization, enhanced equity capital and growth. In the same way, **PP** has its dimensions of production planning. It was assumed that the practices of **PP** will trigger **CPP** through its dimensional effects on cost minimization, enhanced equity capital and growth.

The objectives and the research questions for the study were drawn from the hypothesized relationships between the predictor and criterion variables. The framework assumes a straight line relationship between the predictor and criterion variables. The conceptual framework, which is unidirectional, indicates that **CPP** is a function of **PP**. This is represented in the following mathematical model:

$$CPP = f(PP)$$

Where:

**CPP** = Corporate Productivity Performance.

**PP** = Production Planning

From the conceptual framework, **CPP** is measured by the level of cost minimization, enhanced equity capital and growth. The framework also shows the dimension of **PP** as production planning. Consequently our mathematical model can be expanded thus:

$$CPP = f(p)$$

*Where:*

p = planning

### **III. Methodology.**

The cross sectional survey design is considered most appropriate because what is being investigated is experiences (Anwuluorah, 1987). Again the range of issues and inter-relations are numerous and diverse. The study is also a causal study that is intended to identify the effect of the application of **PP** on **CPP** in the manufacturing industry. The design is expected to reveal the relationship between **PP** and **CPP**. The purpose of a cross-sectional survey therefore is to generate a body of data in connection with two or more variables, and to examine and identify patterns of association (Nachimias, and Nachimias, 1981). This design meets our purpose and enables us to generalize from the result of our sample for the entire population. Furthermore, the causal investigation is adopted in this study and is built around the purpose of hypothesis testing in which we examined the causal relationship between **PP** and **CPP** in a non-contrived setting.

#### **3.1 Population of the Study**

The population consists of those manufacturing companies quoted in the Nigerian Stock Exchange (NSE) fact book of 2009. A total of one hundred (100) manufacturing companies were identified, but a sample of eighty(80) was drawn for the study using stratified random sampling method. In this case, the proportional allocation approach was used firstly to determine the number of companies in each stratum (sector) as classified by the Nigerian Stock Exchange (NSE) Factbook of 2009. Thereafter a simple random sampling technique was used to select members of the sample frame from each stratum (sector).

#### **3.2 Data Collection Methods**

Primary and secondary sources of data collection were explored for this study. The primary data were gathered through the administration of questionnaire designed using Five-Point Likert-Scale. While the secondary data were sourced from the companys' financial statements as reported in the Nigerian Stock Exchange Factbook of 2009.

The structured questionnaire containing questions relating to **PP** with dimension such as production planning, as it affects **CPP** of firms in the Nigerian manufacturing industry were served on chief executives or senior managers in the production and operations department. The copies of the questionnaire were administered personally and online (where applicable) by the researcher to the respondents. Sixty two (62) copies of the questionnaire were retrieved and analyzed.

To generate the qualitative data, we adopted an in-depth personal interview through the use of open ended questions designed to clarify certain issues and obtain further intricate details about the phenomena under investigation which were difficult to capture through the structured questionnaire. Sometimes, since the interviews were conducted after the copies of the questionnaire with their responses have been retrieved, the interview was also used as a confirmatory test of some of the responses especially those that were not clear.

We observed the operations in the study units. Here, we adopted the socio-technical systems model (Susman and Evered, 1978). In this respect, the system's framework guided the collection of facts so that they were organized into an integrated whole about boundaries, transformation of inputs into outputs and the climate of the operations environment. Secondary data were generated from textbooks, journals, company bulletins, annual reports of firms and professional bodies. These materials were reviewed to obtain relevant information about the organisations and the phenomena we have studied.

#### **3.3 Research Hypotheses**

In undertaking this study, we were guided by the following hypotheses:

- Ho<sub>1</sub>** There is no significant relationship between production planning and cost minimization in the Nigerian Manufacturing Industry.
- Ho<sub>2</sub>** There is no significant relationship between production planning and enhanced equity capital in the Nigerian Manufacturing Industry.
- Ho<sub>3</sub>** There is no significant relationship between production planning and growth in the Nigerian Manufacturing Industry.

#### IV. Guide To Decision.

This section provides a verification of the hypotheses that were stated earlier using the simple linear regression analysis.

H<sub>01</sub>: Production planning has no significant impact on cost minimization in the Nigerian manufacturing industry.

In testing this hypothesis, operational efficiency as the variable measure for cost minimization of the selected companies was regressed with the percentage responses of the influence of plan for production activities on productivity performance. The result obtained is presented in the table below;

**Table 4.1: The Impact of Production Planning on Cost Minimization**

Statement Variables	Values
Co-efficient of correlation	0.84
Co-efficient of determination	0.706
t-statistic	3.579
p-value	0.01
Intercept	2.311
Partial Regression Co-efficient	0.006

Source; SPSS Version 16 Window Output

The table revealed an R-value of 0.84, which suggest that production planning has a strong impact on cost minimization. The co-efficient of determination shows that 70.6% variation in cost minimization is accounted for by variations in production planning; hence the model is a good fit. Therefore the null hypothesis that production planning has no significant impact on cost minimization in the Nigerian manufacturing industry was rejected.

H<sub>02</sub>: Production planning has no significant impact on equity capital in the Nigerian manufacturing industry.

In testing this hypothesis, equity capital of the selected companies was regressed with the percentage responses of the influence of plan for production activities on productivity performance. The result obtained is presented in the table below;

**Table 4.2: The Impact of Production Planning on Equity Capital**

Statement Variables	Values
Co-efficient of correlation	0.652
Co-efficient of determination	0.423
t-statistic	3.175
p-value	0.02
Intercept	123997.494
Partial Regression Co-efficient	40466.853

Source; SPSS Version 16 Window Output

The table shows an R-value of 0.652, which suggests a strong impact of production planning on equity capital. The co-efficient of determination shows that 42.3% variation in equity capital is accounted for by variations in production planning, hence the model is of moderate fit. Therefore, the null hypothesis that production planning has no significant impact on equity capital in the Nigerian manufacturing industry was rejected.

H<sub>03</sub>: Production planning has no significant impact on growth in the Nigerian manufacturing industry.

In testing this hypothesis, profit after tax as the variable measure for growth of the selected companies was regressed with the percentage responses of the influence of production planning on productivity performance. The result obtained in presented in the table below;

**Table 4.3: The Impact of Production Planning on Growth**

Statement Variables	Values
Co-efficient of correlation	0.752
Co-efficient of determination	0.565
t-statistic	4.179
p-value	0.003
Intercept	377401.159
Partial Regression Co-efficient	24459.382

Source; SPSS Version 16 Window Output

The table shows an R-value of 0.752, which suggests that production planning has a strong impact on growth. The co-efficient of determination shows that 56.3% variation in growth is accounted for by variations in production planning; hence the model is a good fit.

Therefore, the null hypothesis that production planning has no significant impact on growth in the Nigerian manufacturing industry was rejected.

The following findings were made in this study:-

- 1) Plan for production activities enhances operational efficiency of the firm.
- 2) Plan for production activities enhances equity capital of the firm.
- 3) Plan of production activities enhances growth of the firm.

## **V. Discussion Of Findings**

The logical question one may ask at this point is “what do the research findings entail”? This section is focused on a brief discussion of the research findings by relating them one after the other to previous studies.

### **5.1 Production Planning and Cost Minimization**

The key measure of the success of a firm is its productivity performance; hence business executives work assiduously to actualize this objective. One of the major means of doing this is through cost minimization.

In this study, we observed that production planning has a significant impact on cost minimization and hence profitability of manufacturing companies in Nigeria. 70.6% variation in cost minimization is accounted for by variations in production planning.

### **5.2 Production Planning and enhanced equity capital**

In this research work, it was gathered that production planning has a moderate influence on equity capital of Nigerian manufacturing firms. Increasing the planning of production activity results in 42.3% variation in equity capital is accounted for by variations in production planning. The absence of a significant influence of production planning could be attributed to lack of adequate attention given to production planning by production managers.

### **5.3 Production Planning and Growth.**

With production planning, a firm can meet customer requests for delivery times when feasible, meet the present goals for inventory levels, and minimize per unit cost of production. We observed in this study that production planning is a veritable weapon for improved productivity performance in Nigerian manufacturing firms. It was gathered that 56.5% variation in growth is accounted for by variations in production planning.

Our findings do not differ significantly from prior studies such as Olusegun and Adegbuyi (2010); Everette (2006), Higgins (2001) and Weimer (1999). Olusegun and Adegbuyi in their study revealed that a significant relationship exist between production planning operations and organizational output, though not in the Nigerian manufacturing sector. Everette (2006) reported that forecasting future demand of a firm’s product helps to eliminate any form of disruption to meet expected demand, which consequently enhances profitability and shareholders worth of the business. Higgins (2001) observed that firms with effective production planning system outperform those with an adhoc approach to production operations in around performance measures. Weimer (1999) revealed that productivity is significantly low when there is lack of production planning operations which may result from wastages, error in product design and rework. Consequently, it is safe to say that productivity can be significantly enhanced with adequate production planning operations in Nigerian manufacturing companies just as is the case with companies in developed societies, as reported by the studies cited above.

## **VI. Recommendations**

Based on these findings, the following recommendations were suggested;

- 1) Since production planning enhances corporate productivity performance, Nigerian manufacturing firms must with seriousness be involved in effective and formal planning of production activity and its implementation, irrespective of the size and age of the firm.
- 2) Nigerian manufacturing firms should embrace the application of advanced manufacturing technology, such as automated production technology, computer assisted design and manufacturing (CAD/CAM), robotics and flexible, manufacturing systems.
- 3) To ensure effective application of advanced manufacturing technology in the Nigerian manufacturing industry, professionals with high technical knowhow should be hired by the organization and effective training programmes should be organized for the organizational members who are to be affected by the technological advancement.

- 4) There should be a formal relationship between the Nigerian manufacturing sector and the tertiary institutions. This will go a long way to aid the implementation of research findings.

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## *Production Planning And Corporate Productivity Performance In The Nigerian Manufacturing*

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