Production Improvement Function and Corporate Growth in the Nigerian Manufacturing Industry

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Abstract

This paper investigates the extent to which Production Improvement Function, had affected the Corporate Growth of the Nigerian manufacturing industry. 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 were used for the analysis. From its findings, the study revealed that production planning and control have significant impacts on growth of Nigerian manufacturing industry; while production scheduling has an insignificant and weak influence on growth alone. This finding implies that production improvement function significantly affects the growth of firms. Based on these, the study recommends among others, that the Nigerian manufacturing industry should efficiently and effectively operationalize the all embracing production improvement function, especially in the area of production scheduling, in order to restore the industry as the base of all development.

Keywords: Production Improvement Function, Corporate Growth.

1.0 Introduction

In the evolutionary thesis of man, production has been the major function directed at creating value and therefore growing wealth in society (Bestwick and Lockyer, 2008; Mundel, 1983;). The historical discourse of Production Improvement Function (**PIF**) therefore revolves around Corporate Growth **(CG)** (Corporate Profit Maximization Performance (**CPMP**)). This argument supports the assertion that there is a link between **PIF** and **CG**. This is because, **CG(CPMP)** has been of central importance and objective function to managers and researchers in all forms of formal business organisations, and it is acknowledged to be a crucial factor in organisational efficiency and effectiveness (Billington *et al,* 2003; Pineda, 2009). To this end, Brayton (1983) and Buffa (2001) argue that for business organisations to contribute to economic growth in society, they must ensure commitment in the exercise of **PIF**, and be passionate about their impact on **CPMP**. This lends support to Graig and Harris (1973) assertion and Kendrick and Creamer (2005) acknowledgement that, the theme of **PIF** and **CG** has been the subject of much theoretical and empirical effort in the field of production management and operations research. The subject of **PIF** and **CG** is equally considered critical in all forms of industry. For, as organizations operate in the new knowledge age and increasingly seek for competitiveness, innovativeness and creativeness, they strive to tenaciously hold on to their valued production practices. For instance, Jorgenson and Griliches (2007) identifies that there is a struggle by management all over the world to retain their valued production practices and **CG** is turning out to be one of the most critical issues of the future of effective organisations. This is because, the **PIF** creates value in the system and no organisation can afford to loose its most prized strategies for competing in the global-dynamic business environment.

Graves (1999) postulated that it is now imperative for manufacturing organisations not only to engage in strategic staffing, but to also continually search for ways to retain and raise the **PIF** levels as well as identify their productive competencies in unleashing their creative potentials towards **CG**. This is because retaining the best organisational survival and prosperity strategy and ensuring the maintenance of a competitive edge within the population of organisations can only be achieved through **PIF** which guarantees high level of **CG** (Umoh, 2005; Vollman *et al,* 2007). In the face of the obvious importance of **PIF** in manufacturing organisational practice, there is now a growing need for the emergence of a theory that encapsulates the full force of contributive stream of consciousness which leads to improved **CG**. For instance, while research that examines

the relationship between organisational processes and *CG* is well developed (Kendrick, 2004; Wild. 2008), there is dearth of theory to elucidate the impact of *PIF* on *CG* in Nigerian Manufacturing Industry.

As Jaja (2005) once remarked, little attention has been paid in the literature to the investigation of *PIF* as an organisational phenomenon that might influence *CG* and induce organisational change and development. With particular reference to production management literature, Davies (2005) identifies that the problem is with researchers in the management sciences who emphasize *human beings* rather than the *human doing* or *action*. The author argues that apart from their physical component, human beings make things happen, watch what is happening, wonder what is happening and/or can destroy what has happened by their actions (Davies, 2005; Winston, 2004).

The current gale of de-industrialization in African countries especially as it concerns Nigeria brought to the fore the conviction of Eleanya (2009) who stated that stable European and American states have industries which provide a platform for the citizens to be gainfully employed and usefully engaged hence removing a large segment of the population from, hunger, want, poverty, penury, anger and thus the possibility of being available for recruitment as political thugs, miscreants and possibly instigators of political, economic and social instability and ultimately, revolution. The same cannot be said of Nigeria.

Research evidence 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 which independence is about eleven (11) years older than Nigeria, 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 *PIF* and corporate growth 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 *PIF* and its impact on *CG* in the Nigerian Manufacturing Industry. Correspondingly empirical studies on *PIF* and *CG* specific-research in Nigeria are scanty (Chinweizu, 1979; Agbadudu, 1996) although Chase *et al* (2001) while acknowledging that the models of *PIF* and *CG* 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 of *PIF* on *CG* in the Nigerian Manufacturing Industry with a view to enhancing organizational effectiveness and competitive advantage.

2.0 Theoretical Foundation.

Two key variables were important to the focus of this study and they were the Criterion Variable – *CG* which depends on the Predictor Variable – *PIF*. We defined *CG* as a measure of Productivity. In the same way, *PIF* has its dimensions as production planning, scheduling and control. It was assumed that the practices of *PIF* will trigger Growth through its dimensional effects on productivity.

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 variables and the criterion variables. The conceptual framework, which is unidirectional, indicates that *CG* is a function of *PIF*. This is represented in the following mathematical model:

$CG = f(PIF)$

Where:

CG = Corporate Growth

$$PIF \quad = \text{Production Improvement Function}$$

From the conceptual framework, *CG* is a measure of Productivity. The framework also shows the dimension of *PIF* as production planning, scheduling and control. Consequently our mathematical model can be expanded thus:

$$CG \ = \ f(p, s, c)$$

Where:

p = planning

s = scheduling

c = control

3.0 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 *PIF* on *CG* in the manufacturing industry. The design is expected to reveal the relationship between *PIF* and *CG.* 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 *PIF* and *CG* 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 *PIF* with dimensions such as production planning, scheduling and control as it affects *CG* 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_1 There is no significant relationship between production planning and growth in the Nigerian Manufacturing Industry.

Ho_2 There is no significant relationship between production scheduling and growth in the Nigerian Manufacturing Industry.

Ho_3 There is no significant relationship between production control and growth in the Nigerian Manufacturing Industry.

4.0 Guide to Decision.

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

H_{01}:   Production planning has no significant impact on growth in the Nigerian manufacturing industry.

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

Table 4.1:   **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 analysis shows that changes in production planning accounts for about 56.3% variation in growth, 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

H_{02}:   Production scheduling has no significant influence on growth in Nigerian manufacturing industry.

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

Table 4.2:   The Influence of Production Scheduling on Growth

Statement Variables	Values
Co-efficient of correlation	0.152
Co-efficient of determination	0.023
t-statistic	1.179
p-value	0.243
Intercept	47401.119
Partial Regression Co-efficient	6459.002

Source; SPSS Version 16 Window Output

The table shows an R-value of 0.152, which suggests a weak influence of production scheduling on growth. The analysis shows that changes in production scheduling account for about 2.3% variation in growth; hence the model is not a good fit. Therefore, the null hypothesis that production scheduling has no significant influence on growth in the Nigerian manufacturing industry was accepted.

H_{03}:   There is no significant relationship between production control and growth in the Nigerian manufacturing industry.

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

Table 4.3:   The Relationship between   Production Control and Growth

Statement Variables	Values
Co-efficient of correlation	0.78
Co-efficient of determination	0.608
t-statistic	3.605
p-value	0.002
Intercept	2.33236
Partial Regression Co-efficient	15256.936

Source; SPSS Version 16 Window Output

The table shows an R-value of 0.78, which indicates a strong relationship between production control and growth. The analysis shows that changes in production control account for about 60.8% variation in growth, hence the model is a good fit. Therefore, the null hypothesis was rejected.
The following findings were therefore drawn;
1) Plan for production activities enhances growth of the firm.
2) Schedule for production activities does not increase growth of the firm.
3) Control of production activities enhances growth of the firm.

5.0 Discussion of Findings
The logical question one may ask at this point is "what do the research findings entail"? Therefore, this section of the study is focused on a detailed discussion of the research findings by relating them one after the other to previous studies.

5.1 Production Planning and Growth
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 growth.

In this study, we observed that production planning has a significant impact on profitabilty and hence growth of manufacturing companies in Nigeria. An increase in production planning activity is responsible for

about %56.3 increase in growth. These 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. 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. This implies that productivity is enhanced with adequate production planning operations.

5.2 Production Scheduling and Growth

Production scheduling serves to boost production planning and control. It brings about smooth flow of work throughout the production cycle, prevents conflicts and delays in the use of productive resources and determines the expected time for the arrival of supplies and the shipping of finished products at minimum costs.

In this research work, it was gathered that production scheduling has a low influence on growth of Nigerian manufacturing firms. Increasing the scheduling of production activity results in 2.3% increases in growth. The absence of a significant influence of production scheduling, could be attributed to lack of adequate attention given to production scheduling by production managers. Scheduling is not an end in itself but a means to an end. It boosts production planning and control for improved performance.

Our findings in this study offer support to Olarewaju (2010) and Poterba (2006). Olarewaju (2010) affirms that in order to enhance productivity in Nigerian public service, adequate attention must be given to proper work scheduling by public administrators. This is equally applicable to private sector organizations. More so, Poterba (2006), had asserted that the end result of undermining work schedule in business organization is inefficient operations, low sales revenue and lack of business growth.

5.3 Production Control and Growth.

With production control, 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 control is a veritable weapon for improved productivity performance in Nigerian manufacturing firms. It was gathered that an increase in controlling production operations leads to 60.8% increase in growth. A detailed analysis of these findings revealed that even in most organizations where there are no formal planning, efforts are always made in controlling operations by ensuring that actual output conforms to expected output.

The outcome of this study aligns with previous studies. Ikan (2003) reported that production control aids managers in responding to the resulting threats and opportunities. It detects changes that affect the organization's products and services, thereby promoting corporate growth. Matsushita (2001), indicated that customers' demand for improved design, quality or delivering time from shareholders and management wealth maximization are mere illusions without effective production control. Abrahamson and Pickle (1990), reported that value-added to a product or service so that customers will favour the firm's products as against competitors offer takes the form of above-average quality, which is usually achieved through control procedures.

6.0 Recommendations

Based on the findings of this study, the following recommendations were suggested;

1) Since production improvement function enhances growth and hence productivity performance, Nigerian manufacturing firms must with seriousness be involved in effective and formal planning and control of production activity, 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) It is evident from our findings that production scheduling, which is a component part of production improvement function is generally de-emphasized in most of the companies studied and therefore hinders the smooth flow of work throughout the production cycle which accounts for its insignificant influence on growth. It is therefore recommended that adequate attention should be given to production scheduling by production managers.

5) There should be a formal relationship between the Nigerian manufacturing sector and the tertiary institutions. This will go a long way to make research activities and findings efficient and effective.

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