REFLECTION OF INVENTORY-PRODUCTION COST MINIMISATION AND ORGANISATION'S PROFIT PERFORMANCE.

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Abstract
The paper focuses on the reflection of inventory - production cost minimization on organization's profit "The study aims at identifying various inventory-production cost minimization techniques and strategies that will yield the best optimal level of profit and also, to examine the possibility of inventory-production cost minimization in manufacturing industries. Regression Analysis was used as a research technique and the result indicated that there is positive reflection of inventory-production cost minimisation on organisation profit. Finally, it was recommended that the companies should introduce new technological software that will enable them meet up their daily demand. They should endeavour to use more 'cost minimization techniques as a yard stick in arriving at the optimal level of profit actualisation.
Keywords: Inventory-production, Cost minimisation, organisation's profit and regression Analysis.
JEL: D24, L11, M11

INTRODUCTION

The success of any organisation depends on it effective and proper management of the concept of inventory- production chain system. Manufacturing, companies which are flexible and dynamic just like any other company, should be changing with time as goods are manufactured for stock and order for consumption . So it is necessary to manufacture goods by keeping in view the future trends of demand. Not only that, manufacturing companies will have to complete the task of producing the right quantity and quality of goods according to customer orders, taking full account of future requirements and uncertainties in their estimate inventories and ordering set up.

Inventory-production has posed a great concern to manufacturing companies and it has been established to play a big role in the continual existence of any manufacturing outfit. On the other hand, the role played by cost minimization in inventory-production processes has promoted the study with its impact on the profit of manufacturing companies. But, most companies find themselves in one problem or the other as a result of improper inventory-production cost minimization. It is very important not to overlook this area of study because the effects of inventory-production cost minimization on organization profit are innumerable as it focuses on the free flow of production processes (i.e inventory-production), helps to manage losses and reduces the wastage in raw materials (i.e cost minimization).

From a financial perspective, inventory-production is not a small matter. Oftentimes it takes the largest asset item on a manufacturer or distributor's balance sheet. For this reason, cost minimization can be done because there is a lot of production emphasis on keeping of stock or inventories down. Thus, the objectives of inventory-production cost minimization can be more easily accomplished with modern production processes that are working effectively towards the achievement of reaching the organization's profit..

LITERATURE REVIEW

Inventory-production system consists of a manufacturing plant and a finished goods warehouse to store those products which are manufactured but not immediately sold. The control of dynamic inventory-production systems that evolve overtime is called continuous time systems or discrete-time systems depending on whether time varies continuously or discretely which is a rich research area Sethi and Thompson, (2000). According to Banjoko (1996), inventories are the soul of any manufacturing organization. They refer to the stock of items used within the production system such as basic raw materials, supplies of components or work-in-progress and finished goods.

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Inventory-production management differs from general warehouse management because it involves the determination of how quickly to produce a particular product. The factors involved in many cases are similar, though there are some variances in making the final decision as to how quickly the manufacturing should push items through the production line. In the course of this, the current market demand for the product must be determined. Good inventory-production management occurs when an organisation place a right order at the right time, right quantity, right quality and produce just enough material to satisfy customer's needs without over extending the sale cost of the product.

SCOPE OF INVENTORY-PRODUCTION MANAGEMENT

Inventory-production poses much emphasis on the production of raw materials. This implies that goods kept or stored in the warehouse are produced and designed according to customer orders. What then is production? This question is answered by some notable scholars as follows:

"Production deals with the creation of wealth and involves the process of transforming resources or raw materials into finished goods or products that are desired by consumers" (Classical Economist). "Production is simply the creation of utility". (English dictionary, 6th edition). Production can be lean: Although this seems to connote a negative thought, it is a variation on the theme of efficiency based on optimizing flow. This means that it is aimed at increasing efficiency, decreasing waste, and using empirical methods to decide what matters, rather than uncritically accepting pre-existing ideas. Basically, though, lean is centred on *preserving value with less work,* it is often seen as the improvement of overall customer value. It is also renowned for its focus on the reduction of wastes in materials.

The department that is responsible for the transformation of raw materials into finished goods is the Production department. This is sub-divided into four units namely: Inputs unit (that consists of raw materials and resources), Transformation process (which involves various stages of conversion and processing), output unit (which involves the processed end products) and control mechanism (which regulates the production process for efficient delivery to customers).

Manufacturing is usually linked with production because it is the production of goods or products in the best optimal way. Raw materials are bought and kept for further production so as to pass through the manufacturing process. These raw materials are known as stock. The keeping of stock is called inventory. "Inventories are stock of materials of any kind stored for future use, mainly in the production process. Today's inventory is tomorrow's production. However, semi-finished goods awaiting use in the next process are included in the broad categories of inventories, which are nothing but idle resources.

Inventories are materials of any kind having some economic value, either awaiting conversion or use in future. Inventory-production consists of raw materials, parts, and components which enter the firm's production process" (A.K. Datta, 2003). "Therefore, inventory-production is the manufacturing of materials kept in the warehouse because they are not sold immediately" (Sethi, 2000).

COST MINIMIZATION TECHNIQUES

In many instances, even the best production inventory management strategies fail in the long run due to the cost of the production process, being overlooked as a factor. It is important to maintain a cost effective production process, and this includes making sure that your inventory is not an overwhelming factor. This comes back to not overproducing any items that come of the assembly lines. Doing so is a waste of time and material, costing you excess money to create. Obviously, conservation of the materials, time, and energy consumed in manufacturing unnecessary goods is essential to maintaining a cost effective production inventory management strategy. Be proactive in keeping close watch on all occurrences in your production or manufacturing facility to make sure that there is no waste, and you are guaranteed to achieve a greater standard of success and profitability.

Cost minimization is a means by which management plans positive actions aimed at reducing the cost of production and other costs incurred. It is the reduction in the cost of production. As mentioned earlier, raw materials are bought and kept in order to be transformed into finished goods. Why is this so? It is because cost of transportation, cost of raw materials and cost of production are to be minimized. Manufacturers do

not have to waste their cost on transporting goods every time. Instead, a warehouse is set aside to accommodate those goods produced by them.

The cost of production (which includes materials, labour and service costs) may be reduced by using certain machine-based equipments that will eliminate wastages on the materials used for production (A.O. Olukunle, 2008). The costs involved in inventory-production that are incurred by a manufacturing company are categorized under holding stocks and ordering costs.

On the other hand, stocks have to be maintained and stored in certain conditions, depending on the item involved (e.g. warm, dry, cool, etc). The cost of maintaining these stocks are minimized so that deterioration of stock can be avoided. This implies that the costs to be incurred on the building of another storehouse or the introduction of new heating, ventilation and lighting systems are very expensive (R.J. Cater and P. Price, 1995). In cost minimization we are doing the reverse; we move the "budget constraint" until we find the optimum. Nowadays, companies no longer compete as independent entities but rather as integrated parts of a supply chain; sustainable competitive advantages are likely to come from an adequate inter-functional and inter-organizational collaboration and integration.

The inventory, production and distribution functions are crucial for the operational performance of a supply chain. Despite the abundant literature on the analysis and optimization of production distribution systems, this remains a widely open research area.

Having considered the significance of cost minimization to inventory-production, we shall now discuss the cost minimization techniques that can be employed in order to determine the optimal inventory size.

Lean Production

Lean production is a production that considers the expenditure of resources for any goal other than the creation of value for the end customer to be wasteful, and thus a target for elimination. Working from the perspective of production, lean manufacturing or production occurs when goods of lesser value are produced all in the name of cost minimization and this constitutes the problem of cost minimization

METHODOLOGY

This absolutely refers to the method and techniques used under this study. It also refers to the ideal way or manner of gathering and analyzing data to meet the research objectives.

Sample size

A sample size of 140 respondents is drawn from the two selected companies, cut across all these departments (the production, purchasing/warehousing, quality control and finance department). The researcher resolved to group them into different strata i.e. few members each department from the Top level management, Middle level management and Low level management.

Population of the Study

The population involves all the managers in the two selected manufacturing companies, Flour Mills and Guinness Nigeria Plc in Production department, Purchasing department and Quality control department

Research Designs

The research design adopted is a descriptive research design. Here, effort is made to outline the procedures used for data, nature of the instrument employed, and the source of data et al. which portrays vividly the real design of the study, the researcher tends to know if inventory-production cost minimization really has any effect on any manufacturing organization. This generates two variables; dependent and independent variables on which data are collected from questionnaires. The dependent variable (Organization's Profit) is determined by the (independent variable) effectiveness of inventory-production cost minimization.

Research technique

The data collected is subject to descriptive statistics, correlation and regression analysis
model was employed to justify the position and reflection of inventory-production cost
minimization on organization profit. The error of tolerance formula for sample size
determination is given thus;

$N=n$

$1+\alpha N$ where;

N=Population

α =sample size

Research Instrument

Here, a structured questionnaire was used to gather information on the effects of inventory-production cost on organisation profit. The Questionnaire is divided into three sections; that is the Organization data, Personal data and the General data. Using this instrument was due to the nature of the available data for this research.

Data analysis.

The analysis of data and interpretation of results on the effect of inventory-production cost minimization on organization's profit of selected manufacturing companies .The data analysis was carried out on the combined sample.

Testing of hypotheses for the combined model (Guinness nig. plc and Flour mills Nig. plc.)

Hypothesis 1

Ho: Cost minimization relevance on inventory production cannot effectively reflect on organization's market Share

Model Specification

MKS = f (CSM)

MKS = bo + b1 CSM + Ui

Where: MKS = Organization's profit,CSM = Cost minimization

 U = Stochastic error term

Insert table-1 here

Result and Discussion

MKS= -1.472 + .164 CSM + Ui

Standard error = (1.386) (.019)

t   = (1.062) (8.837)   ___

R= .357, R^2 = .361, R^2 =.601, F= 78.097, DW= 1.886

The null hypothesis (Ho) is rejected while the alternative hypothesis (H1) is accepted (t=8.837, P< 0.05). This implies that cost minimization relevance on inventory-production can effectively reflect on

organization's market share. CSM accounts for 60% variation in MKS. The remaining 40% unexpected variation in MKS is as a result of other variables outside the regression model which are otherwise included in the stochastic error term.\the value of bo (constant term) is -1.472. It implies that holding the value of CSM constant, MKS will be about -1.472. The value of region (DW = 1.886). The regression is significant in terms of its overall goodness of fit (F = 78.097, P < 0.05).

Hypothesis 2

Ho: That the achievement of organization's profit can't be more easily accomplished with inventory production cost minimization

H1:   That the achievement of organization's profit can be more easily accomplished with inventory production cost minimization

Model Specification

PRT = f (CSM)

PRT = bo + b1 CSM

Where: PRT = organization's profit, CSM = Inventory-production cost minimization

U = Stochastic error term

Result of regression Analysis showing the effect of inventory- production cost minimization on organization's profit.

Insert table-2 here

Dependent variable: Organization's profit

S -Significant, NS – Not Significant

Results and Discussion

PRT = 1.391 + .190 CSM + Ui

Standard error = (1.279)   (.017)

t = (1.087)   (11.090)

R= .686, R^2 = .471, R^2 = .467, F=122.94, DW=1.970

The null hypothesis (Ho) is rejected while the alternative hypothesis (H1) is accepted (t = 11.090, P<0.05). This implies that achievement of of organization's profit can be more easily accomplished with inventory-production cost minimization. CSM accounts for 47% of the variation in PRT. The remaining 53% unexplained variation can be attributed to other variables not specified in the model which are otherwise included in the stochastic error term. The value of bo (the constant term) is 1.391. It implies that holding the value of CSM constant, PRT will be about 1.391, The value of DW statistics (1.970) does not fall within an acceptable region confirming the presence of serial autocorrelation in the model. The regression model is statistically significant in terms of its overall goodness of fit (F = 122,994, P < 0.05)

FINDINGS

Findings revealed that there is need for every manufacturing companies to adopt the strategies that will yield the optimal result through operational cost minimisation. Different views and opinions of some scholars\authors were gathered to know the significance of cost minimization to inventory- production. Data for this study was obtained through distribution of questionnaires to a pre-determined sample of employees in both Guinness Nigeria Plc. And Flour mills Nigeria Plc, that are most relevant to the research study and are also in better position to provide relevant information relating to how Inventory – production management cost minimization affects an organization's profit. It was revealed that there is more positive influence of inventory- Production Cost Minimization on Organization Profit.

The first alternative hypothesis states that cost minimization relevance on inventory production can effectively reflect on organization market share.. There was a 60% increase in market share which is accounted for by the cost minimization. Secondly, the achievement of the organizations objective (profit) can be easily achieved through inventory- production cost minimization. The effect of inventory production cost minimization on organization profit is statistically significant at 95% confidence (t = 7.226), it is significant in terms of the overall goodness of fit.

CONCLUSION

Based on the data gathered, it has been brought into conclusion that though there are complexities involved in inventory – production planning, manufacturing companies ensure that there are no wastages in stock materials or inventory produced and they strive to minimize their operational costs or other costs incurred during production.

Conclusively, inventory – production cost minimization has positive reflection and effects on organization's profit provided that the production and management team of such organisation functions well.

RECOMMENDATIONS

This paper offers certain recommendations on how manufacturing companies can improve on their profit maximization through cost minimization on inventory- production process.

1. The companies should introduce new technological software that will enable them meet up their daily demand.

2. They should endeavour to use more 'cost minimization techniques as its yard stick in arriving at the optimal level.

3. That both Flour mills Nigeria plc and Guinness Nigeria Plc should continue to avoid pilferages and unauthorized consumption of materials or stock – piling the warehouse, in order to achieve more profitability.

4. Stock ordering level should be evaluated and that the Economic order Quantity (EOQ) should be maintained so as to help keep particular amounts of inventories in the warehouse.

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Result of static regression on showing the relevance of inventory-production on organization's market share in Nig Manufacturing Companies
Table1.

Model	Co-efficient	Standard error	T	Sig. T	Remark
Constant	-1.472	1.386	-1.06	.290	NS
Cost minimization	.164	.019	8.839	.000	S

Dependent Variable: Organization's market share
S – significant, NS – Not significant

Table 2

Model	Co-efficient	Standard error	t ⎯⎯	Sig. T	Remark
Constant	1.391	1.279	1.087	.279	NS
Cost minimization	.190	.017	11.090	.000	S