PRODUCTION CONSTRAINTS IN RECESSION: A STUDY OF SELECTED QUOTED PHARMACEUTICAL COMPANIES IN NIGERIA

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ABSTRACT: *Pharmaceutical companies in Nigeria are facing several constraints in production as a result of economy recession. The broad objective of this study is to determine the nature of relationship that exists between production constraints and economic recession in selected quoted pharmaceutical companies in Nigeria. Specifically, the study seeks to ascertain the extent to which labour and material constraints affects industrial production. Ex-post facto research design was adopted for the study. Data were sourced from statistical bulletins, while data analysis was done using Pearson Product Moment correlation. The findings revealed that material constraint has a negative relationship with industrial production. Based on the findings, the researchers concluded that there is a significant effect of production constraints in a recessed economy. The researchers however recommended that government should fix the power sector because power is the back bone for industrialization and also government should more regularly enforce quality standards in pharmaceutical companies, so as to maintain standards and to reduce substandard products.*

KEYWORDS: Pharmaceutical Companies, Production Constraints, Recessed Economy

INTRODUCTION

The pharmaceutical industry is one of the industries that are greatly influenced by political and economic changes (Markéta, 2013). It is an industry which can help and can also harm people. The Nigerian pharmaceutical industry is one of the largest industries in Nigeria. The industry is among the most promising and growing sector in West Africa, and it has also been confirmed that about 60 per cent of drug manufacturing in the ECOWAS (Economic Community of West African States) sub-region takes place in Nigeria (Wakeel & Ekundayo, 2016). However, Nigerian Pharmaceutical industry as of today is being overwhelmed by challenges which have weighed down its growth potentials.

In terms of production, contributions from Pharmaceutical Manufacturing Group of Manufacturers' Association of Nigeria (PMG-MAN) and United Nations Industrial Development Organization (UNIDO) affirm that the local pharmaceutical manufacturing industry in Nigeria is currently able to meet 25 per cent of local demand. The remaining 75 per cent has to be covered with imports from Asian companies, most especially, China (Wakeel & Ekundayo, 2016).

Production in the pharmaceutical sector of the country has been greatly constrained by the present economic recession affecting the country. The pharmaceutical companies experience difficulties in producing drugs, dispensable, etc. These constraints arise as a result of exchange rate fluctuations, import duties, high taxation, poor infrastructure, inadequate human capital and non-availability of raw materials. This is as a result of the over dependence on the Nigerian oil market, excessive dependence on imports for both consumption and capital goods and the sharp fall in foreign exchange earnings.

Like many developing nations of the world, Nigeria is significantly in great need of uninterrupted development, sustained democratic governance, investment-friendly environment as well as ultimate stability.

Economists maintain that recession occurs when the GDP growth rate is negative for two consecutive quarters or more. According to Nigeria Finance Minister, Kemi Adeosun, Nigeria's economic situation is in "its worst possible time", (http://www.vanguardngr.com/2016/10/nigerian-economic-recession-entrepreneurial-revolution 2/). The economic recession in Nigeria has affected virtually all sectors of the Nigerian economy; and these effects include, low capacity utilization, terrible fall in the stock market prices, high production costs as a result of general collapse of infrastructure especially power, labour turnover, factory closure, incredible shrinkage in investments and investors relocating their productive facilitates to neighbouring countries (Chukwu, Liman, Enudu & Ehiaghe, 2015).

The National Bureau of Statistics (NBS) data reveal that Nigerian economy has recorded two consecutive quarters of economic contraction. This was reflected in the negative GDP growth rate of Q1 2016 (-0.36%) and Q2 2016 (-2.06%).

Statement of the Problem

The selected pharmaceutical companies are facing several bottlenecks in producing drugs as a result of the economy recession. These challenges arise from importation of raw materials from abroad. The selected companies are being constrained on their production as a result of inadequate raw materials, lack of technology, inadequate human capacity involved in production.

High cost of AGO (diesel/fuel), high taxation and increase in import duties also pose major challenges for these companies. In getting raw materials, these companies also face challenge of increase in exchange rate, challenge of rising cost of production, and as a result they are left with option to either reduce quality or quantity of their products. These issues propelled the researchers to embark on the study in order to identify how production constraints affect a recessed economy.

Objective of the Study

The broad objective of this study is to identify how production constraints are amplified by a recessed economy in selected quoted pharmaceutical companies in Nigeria.

Specifically, the study seeks to ascertain the extent to which material constraint affects industrial production in the selected pharmaceutical companies.

Research Question

To what extent does material constraint affect industrial production in the selected pharmaceutical companies in Nigeria?

Research Hypothesis

H_1: There is a significant positive relationship between material constraint and industrial production in the selected pharmaceutical companies in Nigeria.

Scope of the Study

The study was delimited to production constraints in selected quoted pharmaceutical companies as a result of present economic recession in Nigeria. The study made use of data from five (5) quoted pharmaceutical companies out of the ten (10) currently operating in Nigeria.

REVIEW OF RELATED LITERATURE

Conceptual Review

Production Constraints

Constraint describes the relationships between objects and processes (Lau & Kong, 2004). Production constraints refer to the number of factors that determines the quantity and quality of goods that is being produced within a given time/ period.

As production is cumulative in nature it is important to investigate combined effect of constraints that causes underperformances (Abdelhamid, Jain &Mrozowski, 2010). Production constraints is commonly used as generic term to describe a number of different constructs such as material constraint, labour constraint, human capital constraint, etc

Many factors pose as constraints to various sectors of the economy. Such factors include: exchange rate, availability of raw materials, import duties, infrastructure, labour, machinery and equipments, etc. However, several constraints exist in production;

- External constraints (extent of the market, ability to gain access to appropriate resources).

- Internal constraints (availability of machinery, availability of labour force, access to adequate supply of raw materials and parts, time, finance).

Recessed Economy

Economic recession is referred to as a decline in the economy. It is characterized by symptoms such as rising prices of goods and services, inability of government to meet its financial obligations, exchange rate fluctuations, high level of inflation, increasing levels of unemployment and poor performance of other macroeconomic variables which defines the state of the economy. The National Bureau of Economic Research, 2008 (NBER) defines economic recession as a "significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real Gross Domestic Product (G D P), real income, employment, industrial production and wholesale- retail sale".

The current economic recession in Nigeria has largely affected several sectors of the economy. However, corruption and embezzlement of public fund is also to be blamed for the stunted economic growth which have thwarted all efforts at national development and industrial expansion (Chukwu, Liman, Enudu & Ehiaghe, 2015).

During recession, productivity tends to fall; government imposes higher interest rates, and this reduces consumer and government borrowing. Consumer confidence also reduces, thereby reducing the demand for goods and services. There is also unsystematic laying off of staff and the standard of living of persons dependent on wages and salaries are also affected.

Nigeria is in recession as a result of several factors.

1. Economic factors: oil dependency, Oil price collapse

2. Policy Factors: Governance vacuum (No cabinet for 7 months in 2015), Lack of clarity over economic policy (budget delay, exchange rate policy) and wrong policy choices, financial sector weakness, weak economic cabinet

3. Political/Security Factors: Impact of Niger-Delta militancy on oil production, Impact of Herdsmen/Farmer conflicts on agricultural production across the country, Impact of Boko Haram activity on agricultural output and trade in North-East and impact of Internally Displaced Persons (IDP) situation in the country.

Industrial Production

According to OECD (2017), industrial production refers to the output of industrial establishments and covers sectors such as mining, manufacturing and public utilities (electricity, gas and water). Industrial production of a country is measured using the industrial production index.

The industrial production index is an economic indicator which measures production rate in factories, mines and utilities.

Theoretical Framework

This study is anchored on the Theory of constraints (TOC). The theory of constraints (TOC) developed by Goldratt (1990) is a process that is aimed at identifying and removing constraints in an organizational process that is limiting the achievement of organizational goals.

Cyplik, Hadaś & Domański (2009) posits that Theory of Constraints (TOC) is applied in identifying factors that limit an organization from achieving its goals, developing solution(s) to the problem, and from getting persons to invent the necessary changes themselves. The five steps in applying Theory of Constraints (TOC): Identify, Exploit, Subordinate, Elevate, Re-apply

This theory is relevant to the study in that once management follows the five steps in applying Theory of Constraints (TOC), it enables them invent the requisite changes which leads to maximization of output and attainment of organisational goals in the long run.

Empirical Review

Mirzaei & Mabin (2014) carried out an exploratory study on constraints in projects, using the construction industry as a case study. Data were gotten from multiple semi-structured interviews, and was analysed using two of TOC thinking processes: the Goal Tree and Current Reality Tree. From the study, it was discovered that the absence of centralised priorities for the project was a challenge in adopting Critical Chain Project Management (CCPM).

Markéta (2013) examined the impact of the crisis on the pharmaceutical market in the Czech Republic and Hungary. The aim of the study was to provide the comparative review of the pharmaceutical industry in the selected countries after the financial crises. The study focused on the generic segment of the pharmaceutical industry. Findings of the study revealed that due to low salaries, Hungary was been facing a severe ratio of emigrating medical experts, and also Hungary generic pharmaceutical industry had surpassed the medical device development.

Chukwu, Liman, Enudu & Ehiaghe (2015) carried out a study on the effect of economic recession in textile manufacturing industries in Nigeria. A cross sectional survey was used. The data collected from questionnaire instrument were analyzed using percentages. finding of the study revealed that the effect of economic recession in manufacturing industries are low capacity utilization and factory closure, horrendous nosedive in stock market prices, delisting of share at the stock exchange, fall in commodity prices and low foreign direct investments.

Ghebreslassie, Githiri, Mehari & Kasili (2014) carried a study on Potato Seed Supply, Marketing and Production Constraints in Eritrea. Qualitative and quantitative data were generated using focus group discussion (PRA) and semi structured questionnaire. Findings revealed that there was no standard seed supply system thus majority (91.3%) of the growers purchase seed from open market with a limited supply from the Ministry of Agriculture. The researcher therefore, recommended that an immediate action to establish sustainable seed supply system is taken into consideration in line with a regular extension service to provide technical advice to growers.

Buysse (2010) carried out a study on the Impact of the economic recession on the pharmaceutical sector in 29 European countries. The objective of the study was to assess the impact of global recession on consumption of medicines and pharmaceutical expenditures and prices, and also to investigate medicines that were affected the most and the least by the recession in the countries. Indexed data for pharmaceutical consumption, expenditures and prices from 2007-2009 were gotten from IMS Health. Linear regression analysis was used to establish the relationship between decline in GDP and pharmaceutical consumption in the European region. Findings of the research showed that despite the fact that economic recession affected many countries, very few countries showed decline in pharmaceutical consumption.

Abdelhamid, Jain & Mrozowski (2010) carried out a study on analyzing the relationship between production constraints and construction work flow reliability: A Structural Equation Modeling (SEM) approach in Michigan. The objective of the research was to identify the relation between production constraints and workflow reliability, as measured by the PPC metric, at the production level in a construction project. The research made use of the Structural Equation Modeling (SEM), which is an advanced form of regression analysis. From the findings, the research concluded that production constraints were mostly subjected to constructivist interpretation.

Ikpefan, Isibor & Okafor (2016) carried out a study on deregulation of foreign exchange market and its effect on industrial produce in Nigeria. For the purpose of the study, data was gotten from Central Bank of Nigeria statistical bulletin. The data collected were analysed using ordinary least square technique. Findings of the study revealed that labour and capital were positively significant to industrial produce, while inflation was negatively significant.

Ugwoke, Dike & Elekwa (2016) examined the impact of electricity consumption on industrial production in Nigeria. Time series data were obtained from Central Bank of

Nigeria Statistical Bulletin and World Bank's World Development Indicators for the period of 1980-2014 and analysed using a linear formulation. Findings revealed that electricity supply and trade openness impact industrial production negatively in Nigeria. They were also not statistically significant.

Gap in Knowledge

Reviewed literature showed that most researchers have attempted to study production constrains as it affected several sectors of the economy. However, no research based on the researchers' knowledge has been carried out on how production constrains affects pharmaceutical companies in Nigerian recessed economy.

RESEARCH METHOD

Research Design

Research design is the plan, pattern and blue print that stipulate how data is analysed for the solution of the research problem which was collected and analyzed (Agha, 2011).The study made use of the Ex-Post Facto research design. This is concerned with assessing relationships and effects between two or more phenomena. The relationship measured is a statement about the degree of association between the variables of interest.

Population of the Study

The population of the study was made up of companies under Health Sector, quoted on the Nigerian Stock Exchange which as at 17th April 2016 stood at 10 (NSE Fact Book, 2017/nse.com.ng).The companies are shown in Appendix1.

Sample Size Determination

In determining the sample size of the study, the researchers made use of judgmental sampling. A sample of five (5) companies from the population based on the availability of their financial statement from 2011 – 2016 were selected; only companies with consistent financial statement on the Nigerian Stock Exchange (NSE) were used.

Method of Data Collection

For the purpose of this study, the secondary data source was used. Financial information was obtained from annual financial reports of quoted companies, while aggregate economic information was obtained from the CBN Statistical Bulletin for the relevant years.

Method of Data Analysis

The Pearson correlation was used to examine the nature of relationship that exists between the variables of interest.

Decision Rule:

If the value of P calculated > P critical – Reject the Null Hypothesis, otherwise accept.

DATA PRESENTATION AND ANALYSIS

Data Presentation and Analysis

Financial information of quoted pharmaceutical companies over a 6-year period from 2011 to 2016 was obtained (subject to its availability); this gave rise to a panel data set of observations. The Financial information derived is in Appendix 2. Below is the descriptive statistic of the data.

Table 1: Descriptive statistics of Panel Data

Descriptive Statistics					
Industrial Production	N	Minimum	Maximum	Mean	Std. Deviation
Material Constraints	6	-10.10	8.30	1.4667	6.57074
Valid N (listwise)	6	2.84	13.47	7.0122	4.07297

Source: SPSS Ver. 23

Table 1 above shows the Panel data of various Health sector firms. Shown above is the mean (a measure of central tendency) and standard deviation of the panel data set.

The table shows that the average aggregate material constraint of companies is 7.01. This is an indication that within the period there was a high cost of material in the industry bought locally and from abroad as the constraint revealed an average greater than one (1). The Industrial production on the other hand revealed an average of 1.47

TEST OF HYPOTHESIS

H$_1$: There is a significant positive relationship between material constraint and industrial production.

Table 2

Correlations		Industrial Production	Material Constrain
Industrial Production	Pearson Correlation	1	-.821*
	Sig. (2-tailed)		.045
	N	6	6
Material Constrain	Pearson Correlation	-.821*	1
	Sig. (2-tailed)	.045	
	N	6	6

Source: SPSS Ver. 23

Table 2 above shows a Pearson product-moment correlation run to determine the relationship between material constraint and industrial production. The result revealed a negative correlation between material constraint and industrial production, which is statistically significant as shown in the result were ($r = -.821$, $N=6$ and $p = .045$) thus, we reject the null hypotheses and conclude that there is a significant relationship between material constraint and industrial production.

Discussion of Findings

The findings of this study indicated that on the average, there was a fall in industrial production for the period between 2011-2016. with material constraint having an upward left to right spiral movement indicating increase from 2.84 in 2011 to 13.47 in 2016.

The study revealed that material constraint has a negative relationship with industrial production. This indicates that a continuous increase in material constraints is a contributor to reduction in industrial production.

CONCLUSION

Based on the findings, the researchers concluded that there is a significant effect of production constraint in a recessed economy. This implies that that recession actually affects production in the selected companies.

RECOMMENDATIONS

1. The rate of foreign exchange should be stabilized by monetary authorities to encourage short and medium-term planning in pharmaceutical firms.

2. Government should more regularly enforce quality standards in pharmaceutical companies, so as to maintain standards and to reduce substandard products.

3. Government should fix the power sector because power is the back bone for industrialization.

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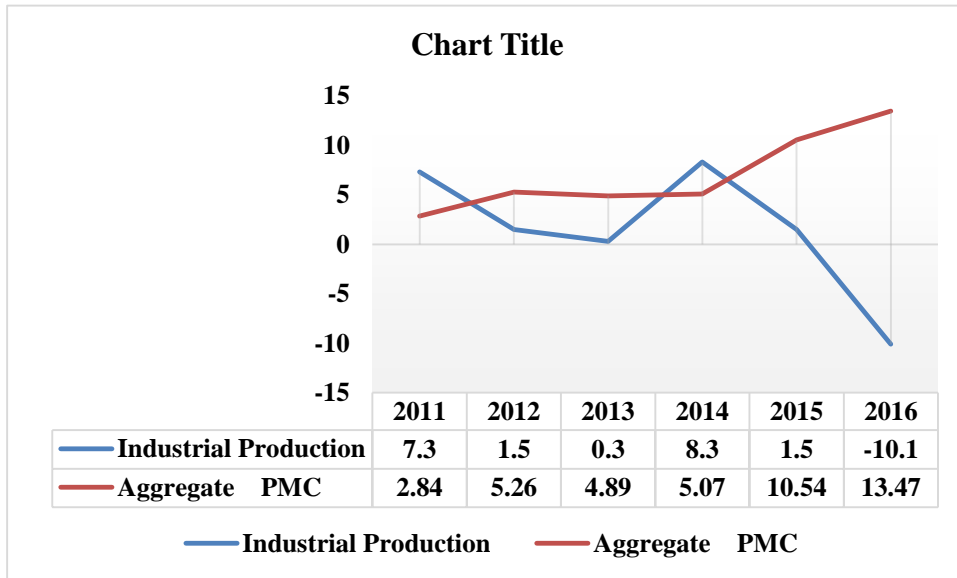## APPENDIX 1: QUOTED COMPANIES UNDER HEALTH SECTOR COMPANIES IN NIGERIA

SN	Name of Company	Corperate Address	Market Capitalization	Date of Incorporation
1	Fidson Healthcare Plc.	268, Ikoroddu Road. Obanikoro, Lagos.	1500000000	March, 13th 1995
2	Evans Pharmaceuticals Plc.	Plot 6, Abimbola Way, Isolo, Lagos	366173685	April, 23rd 1979
3	Union Diagnostic & Clinical Services Plc.	5, EletuOgbi Street. Victoria Island, Lagos.	1776569265	March, 16th 1999
4	May&Baker Nig. Plc	3/5 Sapara Street, Industrial Estate. Ikeja, Lagos	882000000	April, 19th 1994
5	EKOCORP PLC	31, Mobolaji Bank Anthony Way, Lagos	1600508915	October, 9th 1991
6	GlaxoSmithline Consumer Nigeria Plc.	1, Industrial Avenue Ilupeju, Lagos.	16981446130	June, 23rd 1971
7	Morison Industries Plc.	28/30 Morison Crescent. Oregun Industrial Area. Ikeja, Lagos	251094937.5	June 29th, 1955
8	Neimeth Int. Pharmaceuticals Plc.	I, Henry Carr Street, Ikeja Industrial Estate. Ikeja, Lagos.	966843618.2	August, 30th 1957
9	Nigerian-German Chemicals Plc.		556705363.4	January, 10th 1964
10	Pharma-Deko Plc.	Plot C1/1 Okene Close. Agbara Industrial Estate. Agbara, Lagos.	411958851.2	

Source: NSE Factbook 2011-2016/nse.com.ng

APPENDIX 2: Extracted Panel Data

Name of Company	Y	e	a	r	Material Cost	Production Output	Material Constraint
May&Baker Nig. Plc	2	0	1	6	6894506000	7071325000	0.97499493
	2	0	1	5	5807838000	6357577000	0.91353011
	2	0	1	4	5330605000	5710123000	0.93353593
	2	0	1	3	4882865000	5396951000	0.90474511
	2	0	1	2	4464563000	4858987000	0.91882588
	2	0	1	1	3717433000	3936754000	0.94428887
GlaxoSmithline Consumer Nigeria Plc.	2	0	1	6	440335000	5418374000	0.081267
	2	0	1	5	9520461000	9965813000	0.95531203
	2	0	1	4	16473331000	19786112000	0.83257039
	2	0	1	3	14638957000	17581625000	0.83262821
	2	0	1	2	18386280000	20017102000	0.91852857
	2	0	1	1	15739789000	16835165000	0.93493524
Morison Industries Plc.	2	0	1	6	52119000	81063000	0.64294438
	2	0	1	5	69912000	1114351000	0.06273786
	2	0	1	4	100084000	140852000	0.71056144
	2	0	1	3	185261000	242200000	0.76490917
	2	0	1	2	199281000	247108000	0.80645305
	2	0	1	1	68416000	113096000	0.6049374
Neimeth Int. Pharmaceuticals Plc.	2	0	1	6	1159650000	107160000	10.8216685
	2	0	1	5	1159649000	150479000	7.70638428
	2	0	1	4	1456520000	855270000	1.70299438
	2	0	1	3	1472535000	959225000	1.53512992
	2	0	1	2	1849212000	1028283000	1.79834929
	2	0	1	1	0	0	0
Pharma-Deko Plc.	2	0	1	6	567163000	595558000	0.95232202
	2	0	1	5	693537000	769751000	0.90098876
	2	0	1	4	569733000	642268000	0.88706428
	2	0	1	3	527505000	616954000	0.85501512
	2	0	1	2	449586000	546712000	0.82234522
	2	0	1	1	244573000	692638000	0.35310364

Source: Annual Report of Companies 2011-2016/CBN Statistical Bulletin 2016.

Chart Title

	2011	2012	2013	2014	2015	2016
Industrial Production	7.3	1.5	0.3	8.3	1.5	-10.1
Aggregate PMC	2.84	5.26	4.89	5.07	10.54	13.47

— Industrial Production   — Aggregate   PMC

Source: Annual reports of companies/focus-economy.com