EVALUATING THE EFFECTIVENESS OF RECORD KEEPING SYSTEM IN MICRO SCALE ENTERPRISES (A CASE STUDY OF MICRO BUSINESSES IN BAUCHI METROPOLIS)

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Abstract
Accounting record keeping system is of no doubt, very vital to the survival of any micro business in Nigeria. This is because it provides an avenue for recording, classifying, analyzing and communicating data on economic events and contractual obligations between the business and its external environment. Notwithstanding, micro business in Nigeria are characterized with poor accounting standards among others. Many of such businesses do not keep proper records of accounts, which in turn prove to be difficult in assessing the performance of their operations. This study examines the effect of some factors on the behavior of small business owners towards proper record keeping. Decision usefulness theory (DUT) was used to form the conceptual model with three variables. The study was conducted among micro and small businesses in Bauchi metropolis, Nigeria. Simple random sampling method was used with a total valid 209 respondents which involve the owners/managers of micro and small scale businesses in Bauchi metropolis, Bauchi state, Nigeria. The results of the multiple regression analysis revealed that Non-Challant Attitude (NCA) significantly and negatively affect the way and manner in which micro and small scale business owners maintain their proper record keeping (PRK). While Knowledge of Accounting Information (KAI) and Low-Skill Accounting Staff (LAS) have significant correlation with the way micro and small business owners maintain their proper record keeping (PRK) system. This study will help business owners/owners to make relevant adjustments regarding their record keeping system to make it more effective in the economy.
Keywords: record keeping, double entry, accounting information.

Introduction
The dynamic role of micro business as an engine of growth in developing countries has long been recognized. It accelerates the attainment of Macro objectives such as full employment, income distribution, and development of Local technology as well as diffusion of indigenous entrepreneurship have been well documented in various literatures. As a result, the role played by Micro business in economic development of any country cannot be over emphasized.

In Nigeria, micro business and other small-scale enterprises have been expanding since the mid 1980’s following the introduction of structural adjustment program (SAP), which forced many large enterprises to lay off large proportion of their workforce. Since from that time the trend of development and progress in the sub-sector continue to progress through the assistance of the federal government in formulating and providing policies and incentives toward the improvement of the sub-sector respectively (Longernecker, Petty, Palich and Moore, 2010). Notwithstanding, micro business in Nigeria are characterized with poor accounting standards among others. Many of such business do not keep proper records of accounts, which in turn prove to be difficult in assessing the performance of their operations. In addition these shortcomings create more problems such as frequent business failure and limited access to institutional credit due to their insufficiency in accounting information.

Therefore, accounting information is one of the most significant aspects of any business. This is because it provides an avenue for recording, classifying, analyzing and communicating data on economic events and contractual obligations between the business and its external environment. Efficient managing of these enterprises involves accounting practice which is highly dependent on the record keeping of the business transactions (Butler, 2009).

Statement of the Problem
Governments in Nigeria have been playing appreciative role in promoting the growth of micro-scale enterprises in recognition of their flexible and adaptive nature, as well as their re-generative power in promoting economic development. This is because the government believes that dynamic growing
micro enterprises can contribute significantly to the implementation of wide range development objectives. As such, the federal government adopts various strategies and policies which include fiscal incentives through tax relief, financial support through the creation of development financial institutions as well as technical assistance programmes on both managerial and financial expertise.

In spite of all these support programmes and policies, the potentials of micro-scale businesses have not been fully exploited fully. In consequences they performed below expectation as compared to other developing countries of the world.

Negligence in keeping proper accounting records seems as one of the factors militating against the development and efficiency in the micro-scale industries in Nigeria. This is because, incomplete accounting information would result in poor planning and decision making. In addition, this has made other stake holders such as the financial institutions to remain reluctant in financing such businesses despite their potentials in promoting economic development of the country. Research has shown that sixty percent (60%) of Micro Scale Enterprises (MSEs) fail within few months of their operation (Bowen, 2009). Furthermore, Germain (2010) has also confirmed that poor or lack of recordkeeping in a business and especially the Micro and Small enterprises lead to their collapse.

Difficulty exist in ascertaining how far non-recognition of the necessity of accounting to continued existence and growth of Micro Scale Enterprises (MSEs), low educational background of owners of Micro Scale Enterprises (MSEs) and the employment of Low-skilled accounting staff had affected the production of unreliable accounting or financial statement among the Micro Scale Enterprises (MSEs) in Bauchi metropolis.

**Objectives of the Study**

The main aim of this research work is to critically analyze the record keeping of micro scale business and the ways to improve them. The specific objectives are:

- To determine whether employing the services of Low-skilled accounting staff affects the production of reliable accounting information among the MSEs in Bauchi metropolis.
✓ To identify the reason behind non-challant attitude in keeping record among the micro-scale business owners.

Research Questions
i. Does employing the services of Low-skilled accounting staff affects the production of reliable accounting information among the MSEs in Bauchi metropolis?
ii. Does Non-challant attitude of micro-scale business owners negatively affects their proper records keeping?

Research Hypotheses
In a study of this magnitude, formulation of hypothesis is necessary before one can achieve the desired aim. Therefore, the researcher intends to test the following:
Ho1: Non-challant attitude of micro-scale business owners negatively affects their proper records keeping.
Ho2: Inadequate knowledge of micro-scale business owners on the importance of record keeping is responsible for their ineffectiveness in proper record keeping.

LITERATURE REVIEW
Accounting Record Keeping Concept
According to Ademola et al (2012), record keeping is essential to business management. Record keeping involves identification, classification, storage and protection, receipt and transmission, retention and disposal of records for preparation of financial statements. He also included that in record keeping, policies, systems, procedures, operations and personnel are required to administer the records. Record keeping plays a key role in management of knowledge necessary for good business performance. Modern organizations are concerned with the capture, use and storage of knowledge. Laughlin and Gray, (1999) pointed out the following as the most important reasons to set up a good record management:
1. to control the creation and growth of records to reduce operating costs
2. improve efficiency and productivity
3. to assimilate new records management technologies and
4. to ensure regulatory compliance.
Accounting records include entries from day to day transactions of business for instance transactions in respect to receipts and expenditure. Records may include a list of organizational assets and liabilities. These help the enterprise to evaluate their performance in a particular period of time usually at the end of a financial period. Proper record keeping provides evidence of how the transaction was handled and substantiates the steps that were taken in order to comply with business standards. Record keeping is the foundation on which a compliance program should be built upon measures should be put in place to capture the documentation and events that take place throughout a transaction commencing from delivery and payment (Reed 2010).

**Accounting Record Keeping Procedures**

Record keeping cycle involves a process that is followed by Accountants and book keeping staff in processing raw financial data into output information in form of financial statements. The process ranges from creation of business transactions, analyze and record the transactions in the journals by account name, post information from journals to ledgers, prepare a trial balance, journalize adjusting entries, post adjustments from the journal to the ledger, prepare an adjusted trial balance, journalize closing entries, post-closing entries from the journal to the ledger, prepare a post-closing trial balance, and prepare the financial statements (William et al 2008). They specifies further that objectives of record keeping include the following:

i. To provide an accurate, thorough picture of operating results.

ii. To permit a quick comparison of current data with prior years’ operating results and budgetary goals.

iii. To offer financial statement for use by management, bankers and prospective creditors.

iv. To facilitate the prompt filing or reports and tax returns to regulatory and tax collecting government agencies.

v. To reveal employees fraud, theft, waste and record keeping errors.

vi. To allow for fast, accurate, and reliable access to records, ensuring the timely destructions of redundant information and the identification and protection of vital and historically important records.

vii. It is necessary when a firm is seeking fund from a bank for expansion.

Record keeping has become the foundation on which the totality of modern business depends. This is because without it, it will be impossible to ascertain
the level of profitability and the level of business susceptibility to fraud. Record keeping and good record management is also essential for any corporate body to function effectively (Ademola et al. 2012). According to Covin and Selvin, (2008), if the records are kept over a period of time, they give background picture which can help organizational change. Continuing, they said it is not only accounting records that must be kept. In fact personal records enable an accurate evaluation of personnel to aid administration of job selection.

**Accounting Record Storage and Retrieval**

Accounting records are important as they are sources of information and thus they must be numbered and stored properly for the purpose of record retrieval. Crane (1997) defined record storage as the housing of records when whether semi-active or inactive, must still be retained. He also pointed out that records should be stored in a well built records center, the archives, commercial storage and the basement. Reed (2010) defined record retrieval as a system of removing records from their storage places. He stated that file arrangement should support the retrieval of records by either arranging them numerically or alphabetically so as to ease retrieval. Crane (1997) further explained that retrieval should be done by authorized personnel in a record centre. He explained that accounting record documents should be arranged to ensure that files containing restricted information are accessible only to authorized personnel and officials. Best practices for successful record retention program should include; training and education, check lists to ensure inclusions of all required documentation prior to closing a file, paying attention to detail, documenting pertinent information relative to the transaction providing and obtaining instructions in writing, records maintained in an organized manner and stored in a designed area and written standard operating procedures addressing record retention (Reed 2010).

**Bookkeeping Methods**

Book keeping is the recording of business transaction in a systematic and orderly manner while accounting is the classification, analysis and interpretation of the business record for decision making. Accounting skills is required in order the firm business transaction in the following account book as stressed. There are two basic types of bookkeeping methods: single entry
and double entry systems. Standardized bookkeeping systems can be found in business or stationery stores. Computer record keeping systems are also available.

**Single Entry Bookkeeping System**

According to Eric and Gabriel (2012), the single entry system is an "informal" accounting or bookkeeping system where a user of this system makes only one entry to enter a business financial transaction. It generally includes a daily summary of cash receipts and a monthly record of receipts and disbursements (worksheets). A cheque book, according to them, is a single entry bookkeeping system where one entry is made for each deposit or cheque written. Receipts are entered as a deposit and a source of revenue. Cheques and withdrawals are entered as expenses. If a manual system is used, in order to determine the revenues and expenses, worksheets to summarize the income and expenses in different categories are to be prepared. Bookkeeping software and spreadsheets are also available to do this. The emphasis of this system is placed on determining the profit or loss of a business. It got its name because transactions are either recorded as revenue (deposit) or expense (withdrawal). Since each entry is recorded only once, debits and credits (recording method required for the double entry system) are not used to record a financial event. While the single entry system may be acceptable for tax purposes, it does not provide a business with all the financial information needed to adequately report the financial affairs of a business.

According to Barbara (2010), this system uses a cash receipts journal and a cash disbursements journal in addition to the checkbook. All transactions are recorded in one of these journals. It records the flow of income and expenses and is practical for a small business just starting out. The cash receipts journal records all the cash received. It has columns for various categories of receipts with a line for each receipt, including date, source of cash and total amount. The column categories may be departments or types of merchandise, types of service or whatever classifications make sense for business. The cash disbursements journal records the money spent. It has columns for various categories of expenditures which include date, check number, payee, description of expense and total amount. The column categories may be merchandise for resale, supplies, interest, rent, salaries or whatever classifications make sense in the business. The choice of column categories in
both journals is critical to future analysis. All columns in both journals should be totaled each month with year to date totals after each month.

**Double Entry Bookkeeping System**

The double entry accounting systems records financial transactions in relation to asset, liability, income or expense related to it through accounting entries. Any accounting entry in the double entry accounting system has two effects: one of increasing one account, the other of decreasing another account by an equal amount. If the accounting entries are recorded without error, at any point in time the aggregate balance of all accounts having positive balances will be equal to the aggregate balance of all accounts having negative balances. The double entry bookkeeping system ensures that the financial transaction has equal and opposite effects in two different accounts. Accounting entries use terms such as debit and credit to avoid confusion regarding the opposite effect of the accounting entry, for example, if an accounting entry debits a particular account, the opposite account will be credited and vice versa (Williams et al, 2008). According to Alvaro (2010), recording a transaction requires recording what is given up and what is received, recording a transaction requires the noting of two changes every time a change in property occurs and an entry is made in the record system hence terminology “double entry record system”. It is important to observe the relationship between the left side and right side of entries. In other words, increases in business property are recorded on the left side of an asset account, increase in money owed (creditors rights) are recorded on the right side of the of a liability account. Alvaro (2010) brought out that double entry system creates a convenient relationship which permits an interim check of accuracy of recording work at any time during the process. If one is not sure that an entry has been made correctly, one may stop and add up all the left side and then all right side, the two totals should be equal.

**Cash Book or Cash Account**

The cash account record receipts and payment of cash (and cheque). All receipts are recorded/entered on the debit (receiving) side and all payment (money given out) is entered on the credit (giving) side of the cash account that is: debit all receipt and credit all payment.
The Concept of Small and Micro Scale Enterprises

Small scale enterprises have been defined variously by many individuals and institution using various yardsticks such as numbers of employees, volume of sales, value of assets, or the volume of deposit in banks (Ademola et al., 2012). The National Economic Reconstruction Fund (NERF) defined small and medium enterprises with a criterion that projects to be financed by the firm should have a total fixed asset cost (including land) of not more than N10 million. The Federal Ministry of Industry (in respect of the small scale industries credit scheme) sees small scale industry as any manufacturing, processing or service industry with capital investment not exceeding N150,000 in machinery and equipment alone. According to Atijosan (1998), a small business is any manufacturing, processing or servicing industry that satisfies any or all of the following conditions:

- Capital, but excluding cost of land and not excluding N750,000
- Staff strength not exceeding 50 persons and wholly Nigerian owned.
- A manufacturing, processing or servicing industry, exceeding the units of investment stated is relatively small compared to prevalent size of plant and the technology is fairly labour intensive.

According to Ademola et al (2012), small scale enterprises are catalysts for world’s economic growth and development which have dominated the industrial sector of both developed and underdeveloped countries. Aruwa (2006) believed that Nigeria’s industrial sector is dominated by small and medium scale enterprises (SMEs) which accounts for 90% in terms of number of enterprises, as compared with other developed countries where more than 98% of all their enterprises belong to SME sector, about 80% of the total industrial labour force in Japan is SME, 50% in Germany, 46% in USA are employed in smaller firms. Central Bank of Nigeria defined small scale enterprises as all businesses with a total assets investment of less than one million, an annual turnover of less than one million and with a total number of employees of less than fifty (World Bank Mapping 2001). In addition, the International Finance Corporation (IFC) and Corporate Affairs Commission in 2001 further justified that Nigeria’s industrial sector is dominated by SMEs, estimated to be about 90% of the sector employing less than 50% of the people (HPACI 2002). Given the place occupied by the SMEs in Nigeria’s industrial sector, it is expected that the success of the Nigerian
economy would be partly dependent on the success of the SMEs. Nwoye (1991) pointed out clearly that SMEs are catalysts for Nigeria’s economic growth and development. He believes that through so many SMEs, Nigeria has great potentials for success and growth, sales of large volume of goods etc. Even though, some of them have adequate capital, many of them fail due to poor financial management operations.

Role of MSEs in employment creation
MSEs are important drivers of innovation and competition. The SME sector has remained very innovative and adaptable in order to survive the recent economic downturn and recession. Empirical studies show that new firms play a significant role in employment generation (e.g. Garikai 2011, Baptista et al, 2005; Stel & Suddle, 2005), innovation (e.g. Fritsch & Mueller, 2005), economic growth and reduction of unemployment (Garikai, 2011). There is a high correlation between the degree of poverty hunger, unemployment, economic well being/standard of living of the citizens of countries and the degree of vibrancy of the respective country’s SMEs. In most economies, SMEs occupy the greatest proportion of enterprises. The SMEs constitute over 90% of total enterprises in most of the economies and are credited with generating the highest rates of employment growth and account for a major share of industrial production and exports. In the EU, SMEs comprise approximately 99% of all firms and employ between them about 65 million people. In China SMEs provide 75 per cent of the total township and urban employment and as such they play an important role in releasing the employment pressure and maintaining social stability. A study done by the Federal Office of Statistics shows that 97% of all businesses in Nigeria are SMEs. According to Ariyo (2011) the SME sector provides, on average, 50% of Nigeria’s employment, and 50% of its industrial output.
SMEs account for between 55 per cent and 80 per cent of total employment in Western Europe, Japan and USA. There are approximately 23 million SMEs in the US which employ more than 50% of the private workforce, and generate more than half of the nation’s gross domestic product (GDP). According to Muragia (2008) entrepreneurs in America are respected for their role in creating new jobs, providing competition to existing businesses, improving product quality, reducing prices, introducing new goods and services through innovation and technology advancement. In the European Union, SMEs are
seen as largely essential for European employment. Each year, one million new SMEs set up in the European Union. SMEs account for 99.8% of all companies and 65% of business turnover in the European Union.

**Theoretical Framework**

Hendriksen (1982: 1) describes an accounting theory as logical reasoning in the form of a broad set of principles that (1) provide a general frame of reference by which accounting practice can be evaluated and (2) guide the development of new practices and procedures. According to him, an accounting theory should provide a general frame of reference against which sound accounting practices can be evaluated. A theory encompasses a set of statements or propositions connected by rules of logic or inferential reasoning. The statements must include testable hypotheses or premises and a conclusion, although one or more of the premises may be based on explicit value judgments. The primary test of a theory, however, is its ability to explain or predict.

There is no universally accepted single theory of accounting. By employing a combination of deductive and inductive reasoning processes, accounting theories are developed. Deegan & Unerman (2006:5) state that there is no universal agreement on how accounting theories should be developed, since there are so many different perspectives on the role of accounting theory. They nevertheless distinguish three broad categories of accounting theory, viz. prescriptive (normative) accounting theories, inductive accounting theories and predictive accounting theories. An overview of the literature indicates that these broad categories appear (in some form or another) in most works on accounting theory (Hendriksen, 1982; Ryan et al., 2002, Belakoui, 2004).

Prescriptive (normative) accounting theories are based upon what the researcher believes should occur in particular circumstances. These theories describe what financial accounting should be: what should be regarded as assets, liabilities and so on, and how they should be valued. Since these theories are not based on observation, they do not necessarily reflect accounting practice. Deegan & Unerman (2006:10) state, for instance, that Chambers advocated the valuation of assets at market values at a time that historical cost accounting was the accepted norm. The conceptual framework can be viewed as a normative accounting theory.
Inductive accounting theories are constructed by observation and by drawing generalized conclusions from practical observations and measurements. This approach is probably the oldest variant of theory construction in accounting. Accounting practices that have developed in a pragmatic and even haphazard fashion, were observed, generalisations were drawn from such observations and these generalisations were eventually documented as accounting theory. Riahi-Belkaoui (2004:113) notes that theorists such as HRHatfield, S Gilman, A. Clittleton, WAPaton and Yuji Ijiri could be regarded as inductive theorists. Predictive accounting theories (also called "positive accounting theories") focus on explaining and predicting accounting practice, rather than prescribing such practice. Such theories are also based on observation and they often lead to accounting research that is termed positive accounting research. Through observation of existing phenomena, they attempt to predict possible future outcomes, such as, for instance, what particular accounting policies are likely to be adopted by managers in particular circumstances. Decision Usefulness Theory, when conditions are not ideal, there is no such thing as “perfect” or “true and fair” financial statements. Instead, accountants try to prepare statements that are useful to users. To do this, the accountant must identify who are the users and understand their decision problems and information need. Examples of users are investors, government, creditors and others. Investors need the information to decide whether they should invest in a company or not, while government interested in the allocation of resources and, therefore, the activities of entities. It also needs the companies accounting information in the estimation of national income. Creditors are interested in companies’ information to enable them determine whether or not amounts owing to them will be paid when due. Decision usefulness theory, which is based on the viewpoint of managers, who must make a decision about the types of records to be kept and how to keep them, is the underpinning theory to this study. The theory sets out a procedure for allowing additional information to be obtained from reporting entities to revise a decision-maker’s subjective assessment of the probabilities of what might have happened after a decision is made about keeping proper record. The theory is promoted by scholars like Raiffa (1968), Demski(1972), Sterling(1979), Ijiri (1983), Solomons (1989), Laffond (1989), Staubs (1999), Cartney (2004), Henderson (2005), Godfrey et al.(2006) and Scott (2009).
Decision usefulness theory takes the view that “if we can’t prepare theoretically correct financial statements, at least we can try to make financial statements more useful”. The usefulness of financial statements should not be restricted to investors and creditors. Other stakeholders to the affairs of reporting entities, like Inland Revenue Board, should also obtain accounting information that is useful to their decision needs from the reporting entities. Financial statements adopt a reasonable trade-off between relevance and reliability. Relevance and reliability are both critical for the quality of the financial information, but both are related such that an emphasis on one will hurt the other and vice versa. Hence, preparers of financial statements have to trade-off between them to make sure that they are both reflected without having any of the two exercising dominant influence on the direction of the financial statements. Accounting information is relevant when it is provided in time, but at early stages of an entity’s operations information is uncertain and hence less reliable no matter how timely it is.

In terms of its theoretical framework, this study will draw on the Accounting theory and particularly the Decision usefulness theory. This theory attempts to describe accounting as a process of providing the relevant information to the relevant decision makers. Since the theory set out a formal procedure whereby an individual can make the best decision given his or her subjective probabilities, it is then relevant in this research where the MSEs managers are expected not only to monitor their business transactions but also to make the most accurate decisions through proper record keeping that would bring profit to their enterprises. Clelland (1961) explains how entrepreneurs succeed in their business. He contends that successful business operators consider profit to be a measure of success and competency. However, without proper record keeping there is no way the business owner can determine the exact profit he/she make in a particular accounting period. Micro scale business owners set personal but attainable goal for their business and are concern in how well they are doing. In this sense, they are conscious of every transactions accruing from their business and hence they are in a better position to control loss if they keep proper record. The decision Usefulness Accounting theory emphasizes the recording of business transaction for the purpose of effective decision making in business. The recording of the business transactions is determined by various factors some of which are illustrated in the following conceptual framework.
Conceptual Framework
The conceptual framework presented in fig1 shows the relationship between the (independents variables) non-challant attitude, knowledge of accounting information and Low-skilled accounting staff employed by the MSEs managers or owners and the dependent variable (proper record keeping).

![Conceptual Framework Diagram]

**Source:** Field Survey (2019)

Figure 1. Shows how nonchalant attitude, knowledge of accounting information and Low-skilled accounting staff affect proper record keeping.

The conceptual framework presents factors that are helpful in conceptualizing this study. A nonchalant attitude in record keeping (independent factor) discourages proper record keeping (dependent variable) by the owners or managers of the MSEs, knowledge of accounting information (independent variable) encourages proper record keeping, while employment of Low-skilled accounting staff by the owners or managers of the MSEs (independent variable) results in the preparation of unreliable record keeping. In considering that this is a quantitative study, the aforementioned factors will be tested (Creswell, 2011). Consideration will be made to find out how these factors (independent variables) affect the effectiveness or ineffectiveness of proper record keeping system of the MSEs. In essence, the study will determine the skills of book keeping by the owners or managers of the MSEs and establish the availability of resources for book keeping and then find out the extent to which the entrepreneurs keep records of their business transactions. The research will then determine the extent in which this
practice (record keeping) enhances sustainability in proper record keeping of the enterprises (Dependent factor). In considering the fact that the MSEs managers must make profit for their business survival and growth, one of the most important action the managers must engage in is that of accurate records keeping of their business transactions. Although it is a tedious work, but it is considered worth conducting in order to assist the Micro and Small business operators.

**Benefit of Proper Record Keeping**

Proper record keeping provides evidence of how the transaction was handled and substantiates the steps that were taken in order to comply with business standards. Record keeping is the foundation on which a compliance program should be built upon measures should be put in place to capture the documentation and events that take place throughout a transaction commencing from delivery and payment (Reed 2010). The benefits of record keeping cannot be over emphasized. Record keeping has become the foundation on which the totality of modern business depends. This is because without it, it will be impossible to ascertain the level of profitability and the level of business susceptibility to fraud. Record keeping and good record management is also essential for any corporate body to function effectively (Ademola et al 2012). According to Covin and Selvin, (2008), if the records are kept over a period of time, they give background picture which can help organizational change. Continuing, they said it is not only accounting records that must be kept. In fact personal records enable an accurate evaluation of personnel to aid administration of job selection. According Ademola et al 2012, the specific benefits of record keeping include the following:

- It helps to avoid business failure.
- It is useful for financial management planning and control.
- It helps to make sound decisions.
- It gives background picture which helps organizational change.
- It is critical to business survival.

**Methodology**

This study uses survey research design because of the nature of the study by developing a comprehensive questionnaire and administering it to the target
respondents to get their responses on the study. Data was collected from the owners of MSEs within Bauchi metropolis and analysed using a statically package software for social sciences (SPSS).

**Results and DISCUSSIONS**

**Introduction**

The chapter presents the research findings and consists of sections. Section one deals with demographic information of the respondents comprising of gender and age. Similarly, capital strength of the business owners and type of ownership was also presented. The next sections of the chapter cover the results used in testing of relevant hypotheses.

**Sample Descriptive Statistics**

The researcher distributed three hundred and eighty four (384) questionnaires personally to the target respondents but two hundred and nine (209) were returned, indicating 54.4% response rate. The first section dealing with the results about the demographic information of the respondents is presented in Table 4.1. The results show that male respondents have the highest participation of 161 (77.0%) over female counterpart 48 (23.0%). In terms of age, 26–30 years of age were the highest 87 (42.1%) followed by the 31–35 age group with 68 (32.7%), then 21–25 category 46 (21.5%) while the respondents at the age of 15–20 account for 6 (2.8%). 106 of the micro scale businesses were owned by single individuals, while 103 of the micro scale businesses were in partnership.

Table 4.5 Demographic Profile of the Respondents

<table>
<thead>
<tr>
<th>Construct</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>161</td>
<td>77.0</td>
</tr>
<tr>
<td>Female</td>
<td>48</td>
<td>23.0</td>
</tr>
<tr>
<td><strong>Age Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-20</td>
<td>6</td>
<td>2.8</td>
</tr>
<tr>
<td>21-25</td>
<td>46</td>
<td>21.5</td>
</tr>
<tr>
<td>26-30</td>
<td>87</td>
<td>42.1</td>
</tr>
<tr>
<td>31-35</td>
<td>68</td>
<td>32.7</td>
</tr>
<tr>
<td>36-40</td>
<td>2</td>
<td>0.9</td>
</tr>
</tbody>
</table>
With regard to the period of time spent in the business, the results in Table 4.2 show that 209 out of the respondents have spent less than a year in the business making 3.3% of the total data, 45 (22.0%) have been in the business between 1 to 5 years, 68 (33.2%) of them have been in the business for 6 – 10 years, while 85 (41.2%) of them have been in the business for more than 10 years.

In terms of the initial capital with which the respondents established their businesses with, 1 (0.5%) of the respondents started his business with less than N50,000, 46 (21%) started with the amount between N50,000 – N100,000, 80 (37.0%) started with the amount between N100,000 – N200,000, while 78 (36.2 %) started with more than N200,000.

With regard to the current value of their total business assets, 107 (50.0%) of the business owners have their total present asset value standing between N60,000 – N150,000, 85 (41.6%) have their current asset’s value standing...
between N151,000 – N250,000, 8 (4.7%) said their total current asset value is between N251,000 – N500,000 above N500,000.

Table 4.6 Small Scale Business owners Data in Bauchi

<table>
<thead>
<tr>
<th>For how long have you been in the business?</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 year</td>
<td>7</td>
<td>3.3</td>
</tr>
<tr>
<td>1-5 years</td>
<td>45</td>
<td>22.0</td>
</tr>
<tr>
<td>5-10 years</td>
<td>68</td>
<td>33.2</td>
</tr>
<tr>
<td>Above 10 years</td>
<td>85</td>
<td>41.2</td>
</tr>
<tr>
<td>Initial Capital Started with</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than N50,000</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>N50,000 – N100,000</td>
<td>46</td>
<td>21.0</td>
</tr>
<tr>
<td>N100,000 – N200,000</td>
<td>80</td>
<td>37.0</td>
</tr>
<tr>
<td>Above N200,000</td>
<td>78</td>
<td>36.2</td>
</tr>
<tr>
<td>Present value of total assets excluding land</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than N50,000</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>N60,000 – N150,000</td>
<td>107</td>
<td>50.0</td>
</tr>
<tr>
<td>N151,000 – N250000</td>
<td>85</td>
<td>41.6</td>
</tr>
<tr>
<td>N251,000 – N500,000</td>
<td>8</td>
<td>4.7</td>
</tr>
</tbody>
</table>
Above N500,000

<table>
<thead>
<tr>
<th>SN</th>
<th>ITEMS</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The amount of time required to prepare proper record discourages me from keeping proper record.</td>
<td>–</td>
<td>–</td>
<td>2</td>
<td>121</td>
<td>86</td>
<td>4.301</td>
<td>.501</td>
</tr>
<tr>
<td>2</td>
<td>Financial constraint is a major factor that prevents me from employing a record keeper who will assist me with proper record keeping.</td>
<td>–</td>
<td>1</td>
<td>3</td>
<td>132</td>
<td>73</td>
<td>4.234</td>
<td>.526</td>
</tr>
<tr>
<td>3</td>
<td>Confidentiality of my business financial position discourages me from employing a record keeper.</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>150</td>
<td>54</td>
<td>4.125</td>
<td>.522</td>
</tr>
<tr>
<td>4</td>
<td>Evasion from paying appropriate tax to the authority makes me not to keep proper record.</td>
<td>1</td>
<td>8</td>
<td>5</td>
<td>143</td>
<td>52</td>
<td>4.231</td>
<td>.541</td>
</tr>
</tbody>
</table>

Source: Field Survey (2019)

Table 4.3 presents the descriptive results on the views of small businesses’ managers on the effect of non-challant attitude towards proper record keeping. The result for ‘The amount of time required to prepare proper record discourages me from keeping proper record’ shows 2 or 1.0% of the respondents remained neutral while 207 (99.0%) have strongly agreed with the statement. Similarly, 1 (0.5%) did not agree with the statement that ‘Financial constraint is a major factor that prevents me from employing a record keeper who will assist me with proper record keeping’, 3 (1.4%) remained neutral while 205 (98.1%) have agreed with the statement. However, 3 (1.5%) disagree with the statement that ‘Confidentiality of my business financial position discourages me from employing a record keeper’, 2 (1.0%) remained neutral, whereas 204 (97.6%) agreed with the statement with mean values ranging from 4.30 to 4.12. This result proves that Non-Challant Attitude of micro scale business owners negative contributed to the way in which they keep their accounting records.

Table 4.4 presents the descriptive results on the Knowledge of Accounting Information for Effective Record Keeping. The result for ‘I am aware of the importance of record keeping’ shows 2 or 1.0% of the respondents disagreed
with the statement, 20 (9.6%) remained neutral while 187 (89.4%) have strongly agreed with the statement. Similarly, 6 (2.9%) did not agree with the statement that 'My knowledge of accounting information helps me to identify improvements required for record keeping', 30 (14.4%) remained neutral while 173 (82.7%) have agreed with the statement. Also, 64 (30.6%) of the respondents disagree with this statement 'I can record my business transactions even if I did not go to school', whereas 22 (10.5%) remained neutral, 123 (58.8%) agreed with it. However, 70 (33.4%) disagree with the statement that 'Knowledge of accounting information tremendously improves the level of my business effectiveness', 16 (7.7%) remained neutral, whereas 123 (58.8%) agreed with the statement with mean values ranging from 3.82 to 4.33. This result reveals that adequate knowledge of accounting information really helps micro scale business owners in keeping an effective and proper record.

Table 4.4: Knowledge of Accounting Information for Effective Record Keeping

<table>
<thead>
<tr>
<th>SN</th>
<th>ITEMS</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I am aware of the importance of record keeping.</td>
<td>2</td>
<td>20</td>
<td>177</td>
<td>10</td>
<td>10</td>
<td>3.825</td>
<td>.412</td>
</tr>
<tr>
<td>2</td>
<td>My knowledge of accounting information helps me to identify improvements required for record keeping.</td>
<td>6</td>
<td>30</td>
<td>170</td>
<td>3</td>
<td>3</td>
<td>3.714</td>
<td>.477</td>
</tr>
<tr>
<td>3</td>
<td>I can record my business transactions even if I did not go to school.</td>
<td>10</td>
<td>54</td>
<td>22</td>
<td>67</td>
<td>56</td>
<td>3.503</td>
<td>1.253</td>
</tr>
<tr>
<td>4</td>
<td>Knowledge of accounting information tremendously improves the level of my business effectiveness.</td>
<td>11</td>
<td>59</td>
<td>16</td>
<td>95</td>
<td>28</td>
<td>3.332</td>
<td>1.174</td>
</tr>
</tbody>
</table>

Source: Field Survey (2019)

Table 4.5 presents the descriptive results on the effect of Low-skilled record officers on proper accounting record keeping. The result for 'Accounting record officers who possess the required skill of modern record keeping are in a better position to prepare proper accounting records' shows 9 or 4.3% of the respondents disagreed with the statement, 11 (5.3%) remained neutral while 189 (90.4%) have strongly agreed with the statement. Similarly, 9 (4.3%) did not agree with the statement that 'A Low-skilled accounting record officer cannot keep different types of accounting records like; cash sales, cash
purchase, credit sales, credit purchase, other income, and other expenses properly’, 7 (3.3%) remained neutral while 193 (92.3%) have agreed with the statement. Also, 6 (2.9%) of the respondents disagree with this statement ‘A Low-skilled accounting record officer is more likely to keep only one type of accounting record for all the different types of business transactions’, whereas 11 (5.3%) remained neutral, 192 (91.8%) agreed with it. However, 4 (1.9%) disagree with the statement that ‘Shoddy and unreliable accounting records emanate from lack of proper record keeping skill’, 8 (3.8%) remained neutral, whereas 197 (94.2%) agreed with the statement with mean values ranging from 4.39 to 4.02. This result reveals that the extent to which the micro scale business owners keep their accounting record facilitates how they keep proper records.

Table 4.5: Low-skilled Accounting Staff and Proper Record Keeping

<table>
<thead>
<tr>
<th>SN</th>
<th>ITEMS</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Accounting record officers who possess the required skill of modern record keeping are in a better position to prepare proper accounting records.</td>
<td>2</td>
<td>7</td>
<td>11</td>
<td>104</td>
<td>85</td>
<td>4.392</td>
<td>3.527</td>
</tr>
<tr>
<td>2</td>
<td>A Low-skilled accounting record officer cannot keep different types of accounting records like; cash sales, cash purchase, credit sales, credit purchase, other income, and other expenses properly.</td>
<td>-</td>
<td>9</td>
<td>7</td>
<td>135</td>
<td>58</td>
<td>4.147</td>
<td>.679</td>
</tr>
<tr>
<td>3</td>
<td>A Low-skilled accounting record officer is more likely to keep only one type of accounting record for all the different types of business transactions.</td>
<td>-</td>
<td>6</td>
<td>11</td>
<td>164</td>
<td>28</td>
<td>4.022</td>
<td>.549</td>
</tr>
<tr>
<td>4</td>
<td>Shoddy and unreliable accounting records emanate from lack of proper record keeping skill.</td>
<td>-</td>
<td>4</td>
<td>8</td>
<td>141</td>
<td>56</td>
<td>4.191</td>
<td>.589</td>
</tr>
</tbody>
</table>

Source: Field Survey (2019)

Multiple Regression Analysis

In this section multiple regression analysis was used to test the hypotheses formulated in this study.

With regard to the coefficient of determination, $R^2$ indicated 0.053 in table 4.6, which means that 05.3 percent of the changes in proper record keeping can
be predicted by the combination of the three independent variables, while the F-statistics for this research was significant at the one percent level (Sig F < 0.1) indicating the fitness of the model.

The individual model variables presented in table 4.6 shows a significant regression model between Non-Challant Attitude (NCA) and Proper Record Keeping (PRK), in which Non-Challant Attitude ($p < .05$). The result of the model demonstrates that Non-Challant Attitude (NCA) has a negative impact on Proper Record Keeping in such a way that the regression equation predicted almost ($\beta = 0.243$) 24.3% negative contribution to Proper Record Keeping. The regression analysis result indicates that Non-Challant Attitude has a significant negative effect on Proper Record Keeping. Therefore, $H1$: Non-Challant Attitude of Micro scale Business owners negatively affects their Record Keeping is accepted.

Similarly, the individual model variables presented in table 4.6 shows a significant and positive regression model between Knowledge of Accounting Information (KAI) and Proper Record Keeping (PRK), in which Knowledge of Accounting Information ($p < .05$). The result of the model demonstrates that adequate Knowledge of Accounting Information has a positive impact on Proper Record Keeping behaviour in such a way that the regression equation predicted almost ($\beta = 0.021$) 02.1% contribution to the behaviour of Proper Record Keeping. The regression analysis result indicates that adequate Knowledge of Accounting Information has a significant positive effect on the behaviour of Keeping Proper Record. In other words, lack of adequate Knowledge on Accounting Information results in an improper way of keeping accounting records. Therefore, $H2$: Inadequate Knowledge of micro scale business owners on the importance of accounting information is responsible for their ineffectiveness in Proper Record Keeping System is accepted. Meaning that, it is responsible.

Likewise, the individual model variables presented in table 4.6 shows a significant regression model between the Low-skilled Accounting Staff (LAS) and Proper Record Keeping (PRK), in which Low-skilled Accounting Staff ($p < .05$). The regression equation predicted almost ($\beta = 0.097$) 09.7% contribution to the behaviour of Proper Record Keeping. It proved the hypothesis that $H3$: Employing the services of Low-skilled accounting staff negatively affects the production of reliable accounting information among the MSEs in Bauchi metropolis. Therefore, this hypothesis is accepted.
Meaning that, there is a positive relationship between Proper Accounting Record Keeping and the skill of the accounting officer who is saddled with the responsibility of preparing it. A skilled accounting record officer prepares and keeps a proper record, while a Low-skilled accounting record officer prepares an improper accounting record.

Table 4.6 Regression Analysis Results for the Constructs

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>B</td>
</tr>
<tr>
<td>(Constant)</td>
<td>5.417</td>
<td>1.490</td>
<td></td>
</tr>
<tr>
<td>NCA</td>
<td>0.710</td>
<td>0.211</td>
<td>0.243</td>
</tr>
<tr>
<td>KAI</td>
<td>0.028</td>
<td>0.092</td>
<td>0.021</td>
</tr>
<tr>
<td>LAS</td>
<td>0.447</td>
<td>0.347</td>
<td>0.097</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.053</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.039</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. $F$</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-Value</td>
<td>3.834</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: PRK

The findings show that the independent variables will account for 0.053% changes in the behaviour for Proper Record Keeping (PRK). Similarly, it has been found that Non-Challant Attitude (NCA) contributes substantially to the behavioural of proper record keeping with ($\beta = 0.24$), followed by Low-skilled Accounting Staff (LAS)($\beta = 0.097$) and Knowledge of Accounting Information (KAI)($\beta = 0.021$) with ($F = 3.834$).

Findings

This unit presents the summary of the major findings of the study. A significant relationship was found between Non-Challant Attitudes (NCA) and of micro scale business owners and Proper Record Keeping (PRK). The result shows that Non-Challant Attitude of micro scale business owners really has a negative effect on the way they keep their accounting records. While, inadequate knowledge of accounting information (KAI) was found to be responsible for micro scale business owners’ ineffectiveness in practicing a proper record keeping system. Likewise, Low-skilled accounting staff (LAS)
employed by the owners of the business was also found to negatively affect the proper record keeping of the MSEs.

Table 4.7 Summary of the results of the three hypotheses assumed

<table>
<thead>
<tr>
<th>S/N</th>
<th>Hypotheses Statement</th>
<th>Finding ($p$)</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>Non-Challant Attitude of Micro scale Business owners negatively affects their Record Keeping.</td>
<td>0.001</td>
<td>Accepted</td>
</tr>
<tr>
<td>H2</td>
<td>Inadequate Knowledge of micro scale business owners on the importance of accounting information is responsible for their ineffectiveness in Proper Record Keeping System.</td>
<td>0.003</td>
<td>Accepted</td>
</tr>
<tr>
<td>H3</td>
<td>Employing the services of Low-skilled accounting staff negatively affects the production of reliable accounting information among the MSEs in Bauchi metropolis.</td>
<td>0.000</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

Conclusion

The assumption by micro business owners that financial information to their business is only meant for personal consumption is erroneous. This is because many parties are interested in what is going on in the businesses. This indicates government, bands, creditors and other stake holders. Therefore, in conclusion the following are the findings of the research.

1. Inadequate knowledge of micro-scale business owners on the importance of accounting information is responsible for their ineffectiveness in keeping proper accounting record.
2. There is negative relationship between non-challant attitude of the MSEs owners and the effectiveness of their proper accounts record keeping. The result shows that Non-Challant Attitude of micro scale business owners really has a negative effect on the way they keep their accounting records.
3. Likewise, Low-skilled accounting staff (LAS) employed by the owners of the business was also found to negatively affect the proper record keeping of the MSEs.
Recommendation:
Based on the findings made in the course of this study, the following recommendations are hereby suggested:
I. Small scale business owners should ensure that complete and accurate business records are kept because they are essential for decision making. This can be ensured by undertaking course training about records keeping, and hiring the services of knowledgeable and highly-skilled accounting record officers.
II. There is need for the owners and managers of the small scale enterprises to keep abreast with the knowledge of accounting information as this would greatly assist them in ensuring that proper accounting records are maintained in order to be successful in their business transactions.
III. Micro and Small business owners/managers should develop competencies and try to do away with their Non-challant attitude to enhance the quality of record keeping, with specific focus on type, adequacy and updated-ness of records. It is through such records that the danger signals of poor performance can easily be detected to lead to corrective action being promptly taken, hence promoting the long-term liability of the business.

Reference
Eric, E. O. Gabriel, D. (2012), Challenges of BookKeeping on Small and Medium Scale Enterprises (SMEs) in Kwaebibirem District: The Case of Appex Global (Ghana)
Nwoye, M. I. (1991); Small Business Enterprises (How to start and succeed); Social Science Series Benin City Nigeria.
MACROECONOMIC FACTORS AND THE PRODUCTIVITY OF MANUFACTURING SECTOR IN NIGERIA

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Abstract:
The achievement of sustainable economic growth in furtherance of economic development is the major aim of policy makers in various countries as this affects positively on the citizenry. This paper examined the impact of the changes in the macroeconomic factors on the productivity of the manufacturing sector in Nigeria from 1986 to 2015. Secondary data was extracted from the Central Bank of Nigeria 2015 Statistical Bulletin on the various variables of interest which included Gross Domestic Product (GDP), unemployment rate, inflation rate, exchange rate, interest rate and manufacturing output. A preliminary evaluation of the data was conducted using both descriptive statistics and stationarity evaluation. The test indicated that all the variables are not normal. The occurrence of mixed order integration at level and first difference necessitated the deployment of the Autoregressive Distributed Lag (ARDL) technique as the estimation tool. The Generalized least Squares regression was deployed based on the result of the Hausman test which pointed to the direction of long-run connection amongst the variables. The follow-up check of short-run error correction mechanism discovered a 45 present disequilibrium adjustment. The result findings revealed that inflation and exchange rate contributed positively to manufacturing output in the long run. The influence of the rates of interest rate and unemployment were also positive in the short run but had negative impact in the long run. Also, the relationship between manufacturing output and GDP was positively and significant at 1 percent level. The results showed
that manufacturing was a veritable engine of economic growth. In order to check the validity and robustness of the estimation model, the Ramsey RESET test; Cross dependence test; Autocorrelation test and Heteroscedasticity tests were conducted. The tests showed no presence of serial correlation but of heteroscedasticity which although makes the model inefficient but estimator is still unbiased. The study recommended the harmonization of both fiscal and monetary policies for the attainment of macroeconomic stability.

**Keywords:** exchange rate, Gross Domestic Product, inflation rate, interest rate, manufacturing productivity, Unemployment rate.

**Introduction**

Although important, the manufacturing sector is not the primary driver of the economy of developed nations. The service sector has gained ascendancy (Arnold, Javorcik & Mattoo, 2011; Aviral, 2011; Szirmai and Verspagen, 2011). However, the contrary position as reported by Onakoya (2004a) and Szirmai (2009) is that in most of the developing countries the manufacturing sector is the major driving engine of economic growth. The virility of the manufacturing sector in the opinion of Amakom (2012) stimulates the economic efficiency of a country. The Verdoorn's (1949) and Kaldor's (1975) second laws attest to the primal significance of the manufacturing sector to the economy. The basic conclusion being that increased labour productivity in manufacturing sector is positively related to rise in the growth of manufacturing output because of the effect of increased economies of larger production and technical progress. This has also been re-echoed by Libanio (2006) and (Thirlwall, 2013) who found that the productivity-enhancing innovations technologies deployed in manufacturing sector engenders economies of scale in greater proportion than the spill-over effects of in both of the service and agricultural sectors.

The economy of the Nigeria is structured typologically along that of a developing nation. The primary sector (agriculture and mining and quarrying) dominated the economic activities since independence in 1960 (Chete, Adeoti, Adeyinka & Ogundele, 2014). The connection between the manufacturing productivity growth and macroeconomic variables has become one of particular policy relevance in light of the recent economic crisis in Nigeria.
The contributions of the Nigerian manufacturing sector to GDP has fluctuated widely over the years. From a paltry 4.8% at independence in 1960, it grew fifteen years later to 7.4% in 1975. By the end of 1980 its contribution tumbled to 5.4% only to surge to its peak of 10.7%, five years later in 1985. Since then, the manufacturing portion of GDP had declined; 1992 (7.9%), 1997 (6.3%). The lowest ebb ever was 3.4% recorded in 2001, beyond which some traction of 4.21% was gained in 2009 (Central Bank of Nigeria, 2012). The contributions of manufacturing sector to GDP further moved up to 6.67% and 6.83% respectively in 2012 and 2013 (National Bureau of Statistics, 2014).

The recent economic recession also affected the manufacturing sector. Indeed, there was 8.7% reduction in industrial production in the fourth quarter of 2016 over the same quarter in 2015. The average production growth was 1.35% from 2007 until 2016 with a peak of 20.10% in the first quarter of 2011 and the lowest record of -10.10% in the quarter 1 of 2016. Similar fluctuating trends hold for the growth rates of the macroeconomic variables (see Figure 1). The expectation is that they may affect the real sector in different ways.

![Trend of the Variables 1982 - 2015](image)

**Figure 1: Trend of the Variables**
Where: LNMANU = logged Manufacturing output; INF = Inflation rate; IR = Interest rate; LNEXRATE = logged Exchange rate; LNGDP = Logged Gross Domestic Product

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The Structural Adjustment Programme implemented by the federal government of Nigeria in 1986, and consequential economic reforms process over the years have had mixed results. The economic liberalization and deregulation of policies have also attracted both external shocks and generated internal concerns. The shocks amongst others comprise of foreign capital flight, oil price shocks and consequential volatility in the exchange rate, industrial restructuring etc. These have contagion effects with uncertainty and attendant risks in terms of liquidity, inflation, exchange rate, unemployment and interest rates.

These risks, in a varied manner, affect the performance of manufacturing companies given its susceptibility to variations in interest rates, skilled labour shortages, exchange rates, external reserve, foreign direct investment, foreign exchange rates. Indeed, manufacturing has become more capital-intensive, with greater dependence on international markets, especially the West African sub-region. The disparate and conflicting results obtained on the impact of the macroeconomic variables, from the literature makes this research necessary.

There is the challenge of the managing the ‘impossible trinity’ also known as a ‘trilemma. Specifically, it is impossible to achieve all three of the following: fixed exchange rate, free capital movement and independent monetary policy. This is only a part of the challenge faced by policy makers in managing the constituents-macroeconomic variables. The objective of this study is to understand the extent and direction by which the macroeconomic variables drive the Nigerian manufacturing output.

The rest of the study is planned as follows: The review of literature is presented in the next section. In the third section, the employed methodology is discussed. Empirical results and the discussion of findings are covered in the fourth section. The recommendations and conclusions are provided in the concluding section, five.

**Literature Review:**

Theoretical Framework:

There are few theories directly underlining the macroeconomic variables with respect to the manufacturing sector. The pristine theory in this arena are the
Verdoorn’s Law (1949) on the statistical association between the long-run rate of labour productivity growth rate and output growth rate of the manufacturing sector of an economy. This was refined by the Kaldor’s (1966) law culminating in the Kaldor-Verdoorn’s Law. This is consistent with the Arrow (1962) dynamic technical knowledge learning-by-doing) and the endogenous growth theory spearheaded by Romer (1986). The latter theory holds that the inherent features in human capital investment and innovative knowledge significantly contributes to the growth of economy. The persistent development of the economy kindles the manufacturing sector productivity with consequential increase in the total output and aggregate productivity of the economy.

The corollary theories on the relationship between gross total output and the various macroeconomic variables include the Okun law (Unemployment), Phillips Curve (inflation), Keynesian, monetarist and neo-Keynesian theories (monetary policy). These theories which indirectly shape the real sector can be condensed into two seemingly conflicting locus. Indeed, the summation of these theories is encapsulated both the finance-led growth hypothesis which states that the development of the financial sector of the economy propels the real sector and accelerates the growth of the economy. There are two main channels through which the financial sector influence long-run growth. These are through the facilitation of physical and human capital accumulation and by raising the rate of technological progress (Mordi, 2010). The other school of thought is the demand-following responses argued that the development of the real sector fast-tracks financial development. This augments the Capital Arbitrage theory propounded by Samuelson (1948) in which the consequential increase in the foreign reserves of the country may lead to increased confidence in the economy and encourage additional foreign direct investments since international ventures seek higher profit. For growth to occur however, there is the need for a relatively stable macro-economic environment characterized with low risk and a condition for attracting investment and boosting entrepreneurial activities. There is therefore the need to keep lending interest rate and inflation at a manageable limit in an environment of stable exchange rate regime.

**Review of Empirical Literature:**
Some empirical works have explored the connection between the productivity of the manufacturing sector and macroeconomic dynamics. This bring up the
need to understand the concept of productivity which can simply be taken as the rate of real output per unit of input. A broader definition can indeed refer to the affiliation between the production output on the one hand and some inputs resource including capital, labour, equipment and technology. Two sub-concepts of productivity are provided by Anyanwu (2004) and Udo-Aka (1983). These are the ratio of output to the aggregate production factors inputs (total-factor productivity) which. The second sub-concept is the partial productivity which is the percentage of single resource input to the total output. This is calculated using the ex-factory prices of finished products because of the heterogeneous nature manufacturing output (Odior, 2013). The ultimate measure of manufacturing productivity is the sectoral contribution of manufacturing to the GDP.

The first Kaldor (1967) law predicated on a two-year study (1953-1954), conducted using the data of 12 OECD countries established a positive nexus between manufacturing output and economic growth. This hypothesis was also tested by Elhiraika (2008) who evaluated data from 36 countries over eight period (980-2007). Both and confirms compliance. The findings of Millemaci and Ofria (2014) in a study of a cross section of developed countries, and Latin America by Libanio (2006) bear confirmatory testimony together with that of Onakoya (2014b) on the contributions of manufacturing in the context of intersectoral linkages to the growth of the Nigerian economy. On the other hand, Obamuyi, Edun and Kayode (2012) could not confirm an interconnection between economic growth and manufacturing output.

The research by Enu and Havi (2014) examined the influence of the indicators of macroeconomic variables on the industrial production in Ghana. The estimation technique ordinary least squares, employed acknowledged the government spending and import of goods and services as positive influencers. The real exchange rate and petroleum prices were seen as negative deciders influencing agents. An optimum debt-equity mix as asserted by Bakare (2011), is a basic requirement in for the achievement of optimum manufacturing performance. The stochastic characteristics of each of the macroeconomic variables was by examined Odior (2013) who assessed their influence on the productivity of the Nigerian manufacturing sector between 1975 and 2011. The research reports that loans and advances in addition to foreign direct investment increase the manufacturing productivity level of in Nigeria. The impact of
broad money supply was less felt. In a similar vein the relationships amongst savings, debt–equity ratio of firms, interest rates, cost of capital, investment and growth between 1963 and 1981 in Korean was investigated by Sundararajan (1987). He applied the dynamic framework that takes into consideration the complex linkages and interactions among the variables and report disparate affiliations especially with respect to interest rate and manufacturing productivity.

The influence monetary policy on the performance of the manufacturing sector in Nigeria was investigated by Imoughele and Ismaila (2014). Data covering the period 1986-2012 were obtained from various issues of the Central Bank of Nigeria and the National Bureau of Statistics. The results that reveal whereas the rate of interest and money supply (broad) were statistically insignificant, the rates of inflation and exchange together with the external reserve were significant, and negatively related to the manufacturing sector output in both the current, and the previous year. A uni-directional causality exist between the real rate of exchange and external reserves and the manufacturing output.

The examination of the effect of interest rates adjustments on the development of an emerging market was conducted by Ayanwale (2013) in a study spanning 40 years from 1970 to 2010. Using the Error Correction Model to reconcile the variations in the variables in the short and long run the, fluctuations in the rates of exchange and interest were significant statistically. This is indicative of a short-run influence of the rate of interest on the gross fixed capital formation. This also applies to the changes in inflation with respect to gross domestic product.

The provisions of Okun’s law which in its pristine form provide for 1 % reduction in output when the cyclical unemployment rate increases by 2% (Okun, 1962). The law is often disparaged for being bereft of a theoretical underpinning (Harris & Silverstone, 2001 and Kwami, 2005) it has in the main provided a robust explanation for the subsisting relationship between the two variables. However, a contrarian report was made by Malley and Molana (2007) who find a positive association between output and unemployment when an economy operates at an inefficient, or ‘low-effort’. The divergent finding was borne out of a stylised model of an imperfect supply market of goods and labour using G7 countries data from 1960 and 2001. The German data was strongly suggest persistent negative association between the rate of
unemployment and the level of output. Conflicting results have been reported on the applicability of Okun’s law in the Nigeria. They report a stagflation situation (Njoku, & Ihugba, 2011; Sanusi, 2012; Amassoma & Nnwosa, 2013) with conflicting results; they indeed report a stagflation situation. The import of these for the manufacturing industry is that imperfections in the market could hinder the smooth working of expansionary and / or stabilization macroeconomic policies.

The importance of the manufacturing was reiterated by Owyang, Sekhposyan & Vermann (2013) who found that changes in unemployment are more responsive to changes in output in areas with more manufacturing workers. Indeed, a 1% -point rise in the percentage of payroll employment from manufacturing increases Okun's coefficient by 0.01. This is corroborated by the work of Berument, Dogan and Tansel (2009) who evaluated macroeconomic policy and unemployment by sectoral economic activity with evidence gathered from Turkey. The researchers employed the VAR model found that positive income shock is followed by a reduction in unemployment in all economic activity groups including the manufacturing sector.

The cointegration and error correction techniques were deployed in finding out the determinants of manufacturing output in Ghana by Anaman and Osei-Amponsah (2009). The research covering 1974 to 2006 report a long-run nexus between the output of the manufacturing sector and political stability, the level of per capita real GDP, and the export-import ratio. Using similar technique, a long-run connection was established in the investigation into the efficacy of monetary policy on manufacturing sectoral output. The econometric Nigerian study by Imoughele (2014) between 1986 and 2012 deployed the Johansen Co-integration and Granger Causality test. The findings show that indeed, inflation, exchange rate and external reserve positively propelled the growth in the manufacturing sector. These have implications for the performance of the manufacturing sector.

**Methodology:**
The ipso facto empirical research design is employed this research to investigate the connection between the macroeconomic variables (unemployment, rate of exchange, rate of inflation and interest rate) and the sustainability of the manufacturing companies in Nigeria.

**Description and Sources of Data:**
For the purpose of the research objectives, the contribution of the manufacturing sector (MANU) to GDP is the dependent variable. The independent variables are the macroeconomic variables consisting of the GDP, unemployment rate, rate of exchange, the rate of interest and the rate of inflation rate (Kamaan, 2014 and Taylan, 2012).

Model Specification:
Several approaches and techniques have been deployed, one which was to regress the macroeconomic variables on manufacturing productivity. The model that will be used for the evaluation of the hypotheses of this research is adapted from the work of Fasanya, Onakoya and Agboluaje (2013). The original model made use of the Keynesian IS-LM framework with consideration given to the liquidity puzzle, the price puzzle and the exchange rate puzzles. The original model used in the work is given as:

$$\Delta GDP_t = \alpha_0 + \alpha_1 \Delta GDP_{t-1} + \alpha_2 \Delta M2_{t-1} + \alpha_3 \Delta IR_{t-1} + \alpha_4 \Delta INF_{t-1} + \alpha_5 \Delta REER_{t-1} + \alpha_6 \Delta ER_{t-1} + U_t$$  \hspace{1cm} (1)

Where $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6$ are parameters for economic growth (GDP), money supply, interest rate, inflation rate, real exchange rate and external reserve. This study adopts this model with some modifications made to the variables. The model to be adopted in this study eliminates external reserve and incorporates unemployment rate. These are regressed against the contribution of the manufacturing sector to the GDP. These is used to establish the relationship between macroeconomic variables and manufacturing contribution to GDP in Nigeria.

The Keynesian IS-LM framework can be linked with the augmented Solow growth model and the endogenous growth theory which form the theories which are adopted in this study. The augmented Solow growth model considers investment in human capital as a driver for economic growth which can be achieved through capital accumulation. For capital to be acquired however, the decisions made as regards to interest rate have to be reasonable as it determines the kind of capital that is existent in an economy (whether it is domestic or foreign capital). Reduction in interest rates triggers inflation and affects the level of investment as people have more capital to purchase goods and services as captured in the liquidity and price puzzles of the
Keynesian IS-LM framework. The endogenous growth model also follows a similar manner as the augmented Solow growth model. According to this model, capital accumulation is key for economic growth, but much emphasis is placed on technological progress. For the purpose of this research, the model to be adopted is specified as

$$MANU = f(INF, INT, REER, UNEMP)$$

(2)

$$MANU_t = \beta_0 + \beta_1 GDP_{t-1} + \beta_2 \Delta M2_{t-1} + \beta_3 INT_{t-1} + \beta_4 \Delta REER_{t-1} + \beta_5 UNEMP_{t-1} + U_t$$

(3)

Where $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$ and $\beta_5$ are parameters of the model which are Economic Growth ($GDP$), Money Supply ($M2$), Interest Rate ($INT$), Real Exchange Rate ($REER$) and Unemployment Rate ($UNEMP$) respectively; $U_t$ is the disturbance term.

**Method of Data Analysis:**

This study would employ the use of the E-views 9.0 statistical software for the data analysis. The empirical estimation is in three phases. In the first segment - pre estimation, it employs a trend analytical and graphical representation showing the movements over various years of the variables. Other pre estimation tests include the normality tests using the descriptive statistics. The normality tests is on the variables carried out to ensure that they do not violate the properties of a standardized normal distribution. For this purpose, the mean, standard deviation and skewness of the variables is used in addition to the skewness, kurtosis and Jarque Bera values of the variables distribution. Time series data by nature generate a stochastic or random process. The underlying trending characteristics of time series data lend them to random walk. A stochastic process is stationary where the mean value and the value of the variance are constant over time. The additional condition being that the covariance value between two time periods hinges only on the lag between two time periods and not on the actual computed time. The implication of these for time series data is the stationarity condition which if not tested may result in unreliable analytical results. The Augmented Dickey Fuller (ADF) test is applied for testing the presence of stationarity. Based on the result of the stationarity tests, the decision rule is to reject the null hypothesis of no
random walk when all variables are stationary of the order level. In the alternative, the acceptance of non-stationarity leads to the next step of testing for cointegration among the variables.

The second phase in the estimation phase is the test for possible long term cointegration among the variables. The Johansen and Bounds tests are applied. The former test is a multi-model method in contrast to the latter which is a single equation model. The two techniques explains both the short-run and long-run relationship affiliations between them and determines the level of cointegration among them.

Before the estimation of the long-run connection, the lag length to be used in the model is selected using the likelihood ratio (LR). The selection of appropriate lag length would ensure that the residuals do not have significant autocorrelation since autocorrelation leads to inconsistent least square estimates (Enders, 1995). The study complements the LR test with Schwarz Information Criterion (SIC) as well as Akaike Information Criterion (AIC) statistics. These lag selection criteria enables one to select the smallest lag order with no much loss in the degrees of freedom. However, with the availability of Evaiews 9, this process has been computerized, as the E-views automatically sieve through the model to present the utmost lag length that is suitable for the purpose of the work, which thus eliminate the need for manual elimination process.

Where the stationarity result reveals a mix of integration and level I(0) and at first difference I(I), the Bound test based on the Auto regressive Distributed Lag (ARDL) is selected. The Johansen co-integration test is deployed if on the other hand all the variables are of the first order (I(I)).

The Autoregressive Distributed Lag (ARDL) model is used to analyse the short run relationship between the dependent variable and the independent variables. It is commonly applied to econometric models within which the data have a long run stochastic trend (cointegration). It gives us the perfect view of the short run behaviour of the variables and how they individually affect the dependent variable. Granger causality test is thereafter deployed to determine the direction of causality amongst two variables in a pair-wise sequence.

The third phase in the estimation process are the post estimation tests, required to determine the robustness of the estimated model. One of the major violations of the basic Least Squares rule is when the error terms of
successive periods are interrelated. The violation of this rule results in lower than acceptable range for the standard errors of the coefficient variables which thus renders them inefficient in the estimation process. It is paramount to carry out the 3 autocorrelation test to determine the level of reliability of the model.

The test for Heteroskedasticity is carried out to determine if the error terms are constant over time, and to be sure that the error terms are not somewhat related or correlated with the explanatory variables. The presence of heteroskedasticity violates the basic Least Square assumptions and renders the standard error of the variables too low and consequently can lead to Type 1 error.

Another post-estimation test involves multicollinearity. This is a must-have in time series variables which is the situation presented in this work. The focus is not the elimination of the presence of multicollinearity in the model, but rather to minimize its effect so as to ensure the consistency of the model estimation.

Findings and Discussions:

Preliminary Analyses:
This section covers the descriptive statistics and stationarity test which are presented in turns.

Descriptive Statistics
The series descriptive statistics are presented in Table 1.

<table>
<thead>
<tr>
<th>STATISTICS</th>
<th>INF</th>
<th>IR</th>
<th>LNEXRATE</th>
<th>LNGDP</th>
<th>LNMANU</th>
<th>LNMS2</th>
<th>UNEMPLOYR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>19.72</td>
<td>17.81</td>
<td>3.23</td>
<td>28.49</td>
<td>25.56</td>
<td>27.04</td>
<td>10.43</td>
</tr>
<tr>
<td>Median</td>
<td>12.23</td>
<td>17.80</td>
<td>3.09</td>
<td>28.70</td>
<td>25.69</td>
<td>26.99</td>
<td>7.00</td>
</tr>
<tr>
<td>Maximum</td>
<td>72.84</td>
<td>31.65</td>
<td>5.26</td>
<td>32.17</td>
<td>29.83</td>
<td>30.55</td>
<td>27.40</td>
</tr>
<tr>
<td>Minimum</td>
<td>5.38</td>
<td>8.92</td>
<td>-0.48</td>
<td>24.67</td>
<td>22.27</td>
<td>23.45</td>
<td>1.80</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>17.94</td>
<td>5.039</td>
<td>1.94</td>
<td>2.53</td>
<td>2.390</td>
<td>115</td>
<td>2.44</td>
</tr>
<tr>
<td>Skewness</td>
<td>1.63</td>
<td>0.18</td>
<td>-0.71</td>
<td>-0.12</td>
<td>0.25</td>
<td>-0.02</td>
<td>0.76</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>4.37</td>
<td>3.43</td>
<td>2.15</td>
<td>1.69</td>
<td>2.04</td>
<td>1.63</td>
<td>2.27</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>18.17</td>
<td>0.44</td>
<td>4.03</td>
<td>2.58</td>
<td>1.73</td>
<td>2.73</td>
<td>4.17</td>
</tr>
<tr>
<td>Probability</td>
<td>0.00</td>
<td>0.80</td>
<td>0.13</td>
<td>0.28</td>
<td>0.42</td>
<td>0.26</td>
<td>0.12</td>
</tr>
<tr>
<td>Sum</td>
<td>690.01</td>
<td>623.18</td>
<td>112.89</td>
<td>997.23</td>
<td>894.62</td>
<td>946.32</td>
<td>365.10</td>
</tr>
<tr>
<td>Sum Sq. Dev.</td>
<td>10,937.60</td>
<td>863.24</td>
<td>128.12</td>
<td>217.03</td>
<td>194.23</td>
<td>203.18</td>
<td>2,147.26</td>
</tr>
<tr>
<td>Observations</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
</tbody>
</table>

Source: Authors’ computation using E-views 8.0 (2017)
Table 1: Descriptive Statistics of the Variables:
The evidence provided in Table 1 show significant trend variations in the variables given the large differences between the maximum and minimum values of the series. Also, all the series were skewed positively except exchange rate, gross domestic product and money supply. The values, exchange rate, gross domestic product, manufacturing output to gross domestic product, unemployment rate and broad money supply ($MS_2$) are platykurtic in nature because its kurtosis value were less than 3 which is the threshold for normal distribution. The variables, Inflation rate and interest rate had values 4.37 and 3.43 respectively as its result which signified that it was leptokurtic in nature because its value is greater than 3 indicating a higher than normal distribution.
The goodness of fit test (Jacque-Bera) statistic signposts the combined skewness and kurtosis standard. The Jarque-Bera p-values is indicative of the non-normality of the series. Nevertheless, and in order to check stability of the series, the unit root test had to be conducted. The result of the exercise is made available in the next section.

**Stationarity Test Results:**
The unit root test results are presented in Table 2.

**Table 2: Unit Root Test Results: Augmented Dickey Fuller Test:**

<table>
<thead>
<tr>
<th>Series</th>
<th>5% Critical Value</th>
<th>ADF Test at first difference (Prob.)</th>
<th>Equation Specification</th>
<th>Order of integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>INF</td>
<td>-2.96</td>
<td>-5.35 (0.00)</td>
<td>Intercept</td>
<td>I(1)</td>
</tr>
<tr>
<td>IR</td>
<td>-2.96</td>
<td>-5.05 (0.00)</td>
<td>Intercept</td>
<td>I(1)</td>
</tr>
<tr>
<td>LNEXRATE</td>
<td>-2.96</td>
<td>-4.96 (0.00)</td>
<td>Intercept</td>
<td>I(1)</td>
</tr>
<tr>
<td>LNGDP</td>
<td>-2.96</td>
<td>-5.48 (0.00)</td>
<td>Intercept</td>
<td>I(1)</td>
</tr>
<tr>
<td>LNMANU</td>
<td>-2.96</td>
<td>-5.45 (0.00)</td>
<td>Intercept</td>
<td>I(1)</td>
</tr>
<tr>
<td>LNMS2</td>
<td>-2.96</td>
<td>-3.27 (0.00)</td>
<td>Intercept</td>
<td>I(1)</td>
</tr>
<tr>
<td>UNEMPLOYR</td>
<td>-2.96</td>
<td>-4.28 (0.00)</td>
<td>Intercept</td>
<td>I(1)</td>
</tr>
</tbody>
</table>

Source: Authors computation using E-Views 8.0 (2017)

Since all the variables in table are all stationary at first the difference the use of the Ordinary Least Square (O.L.S) estimation technique is unsuitable. The Johansen cointegration test is applied for determining the long-run
relationship amongst the variable. This method as designed by Johansen (1988) and Johansen and Juselius (1990) is based on an unrestricted vector autoregressive (VAR) model which is specified in the form of error-correction model. Prior to this estimation, the optimal lag length will have to be calculated because the cointegration technique is lag sensitive.

**Estimation Results:**

Optimal Lag Length Selection:
The lag selected length expounds the consequential implication of the previous year’s result of previous year on the current year. The result is provided in Table 3.

Table 3: Optimal Lag Length Selection Criteria:

<table>
<thead>
<tr>
<th>Lag length</th>
<th>LogL</th>
<th>LR</th>
<th>FPE</th>
<th>AIC</th>
<th>SC</th>
<th>HQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-250.96</td>
<td>NA</td>
<td>0.02</td>
<td>16.12</td>
<td>16.44*</td>
<td>16.22*</td>
</tr>
<tr>
<td>1</td>
<td>-194.14</td>
<td>85.23*</td>
<td>0.02*</td>
<td>15.63</td>
<td>18.20</td>
<td>16.48</td>
</tr>
<tr>
<td>2</td>
<td>-139.38</td>
<td>58.19</td>
<td>0.02</td>
<td>15.27*</td>
<td>20.08</td>
<td>16.87</td>
</tr>
</tbody>
</table>

Source: Authors computation using E-views 8.0(2017)

* indicates lag order selected by the criterion

HQ = Hannan- Quinn information criterion

AIC = Akaike information criterion

LR = sequential modified LR test statistic (each test at 5% level)

SC = Schwarz information criterion

FPE = Final prediction error

The different criterion selected disparate optimal levels. As advised by lowest lag length as prescribed by the Schwarz information criteria (0) is selected. The next step in the estimation process - the Co-integration is presented in the next section.

**Cointegration Test Result:**

Two kinds of tests considered under the Johansen cointegration technique are the Eigenvalue and Trace statistic tests. The Trace statistics in examining the null hypothesis assumes that the number of distinct cointegrating vectors (r) is more than the (r) against a general alternative. On the other hand, the
maximal eigenvalue tests measures \( (r) \) against the alternative of \( r+1 \) cointegrating vectors. The respective equations are as follows:

\[
\lambda_{\text{trace}} = -T \sum_{i=r+1}^{n} \ln (1 - \lambda_i^2) \\
(4) \\
\lambda_{\text{max}} = -T \ln (1 - \lambda_{r+1}) \\
(5)
\]

Where:
\( \lambda_i \) = the estimated values of the ordered eigenvalues \\
\( T \) = the number of the observations after the lag adjustment.

The Johansen Co-integration result based on hypothesized 5 percent level of acceptance is reported Table 4.

Table 4: Result of Johansen Co-integration test based on Trace Statistic and Max Eigenvalue:

<table>
<thead>
<tr>
<th>No. of CE(s)</th>
<th>Trace Statistic</th>
<th>Max. Eigen Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Eigenvalue</td>
<td>0.05 Critical Value</td>
</tr>
<tr>
<td>None *</td>
<td>0.93</td>
<td>238.05</td>
</tr>
<tr>
<td>At most 1 *</td>
<td>0.88</td>
<td>156.43</td>
</tr>
<tr>
<td>At most 2</td>
<td>0.76</td>
<td>91.83</td>
</tr>
<tr>
<td>At most 3</td>
<td>0.56</td>
<td>47.06</td>
</tr>
<tr>
<td>At most 4</td>
<td>0.29</td>
<td>21.47</td>
</tr>
<tr>
<td>At most 5</td>
<td>0.20</td>
<td>10.03</td>
</tr>
<tr>
<td>At most 6*</td>
<td>0.12</td>
<td>4.11</td>
</tr>
</tbody>
</table>

Source: Authors computation using E-views 8.0 (2017)

Notes:
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The Johansen co-integration test are optimized at most 6 which means the presence of a long-run connection between the output of manufacturing and GDP, inflation rate, interest rate, exchange rate, gross domestic product, broad money supply(MS2) and unemployment rate. The result of the estimated long-run relationship is presented in Table 5 and equation (6).
Vector Error Correction Model:
In order to know the existence of possible short-term relationship, the Vector Error Correction Model is estimated. This is done by integrating the multivariate time series, the dynamics of which assists the maintenance of the equilibrium in the long-run. The result is reported in Table 5.

Table 5: Vector Error Correction Model (VECM) Result:

<table>
<thead>
<tr>
<th>Error Correction:</th>
<th>D(LNMANU,2)</th>
<th>D(INF,2)</th>
<th>D(IR,2)</th>
<th>D(LNEXRATE,2)</th>
<th>D(LNGDP,2)</th>
<th>D(LNMS2,2)</th>
<th>D(UNEMPLOYR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CointEq1</td>
<td>0.63</td>
<td>17.72</td>
<td>-4.47</td>
<td>-0.13</td>
<td>0.42</td>
<td>-0.11</td>
<td>1.20</td>
</tr>
<tr>
<td></td>
<td>(0.198)</td>
<td>(8.19)</td>
<td>(2.02)</td>
<td>(0.22)</td>
<td>(0.09)</td>
<td>(0.06)</td>
<td>(1.30)</td>
</tr>
<tr>
<td>T-stat (Cal)</td>
<td>[3.53]</td>
<td>[2.16]</td>
<td>[2.22]</td>
<td>[-0.61]</td>
<td>[4.61]</td>
<td>[-1.74]</td>
<td>[0.92]</td>
</tr>
</tbody>
</table>

Source: Authors computation using E-views 8.0 (2017)

The null hypotheses is accepted since the tabulated absolute T-stats value (2.05) is greater than the calculated absolute value $LNEXRATE$ (0.61), $LNMS2$ (1.74) and $UNEMPLOYR$ (0.92). This means that no short run association exists among manufacturing output and each of GDP, exchange rate, broad money supply and unemployment rate. This does not apply to $INF$ (2.16), IR (2.99), $LNGDP$ (4.61) which is greater than the tabulated T-stats value. After normalization with respect to the independent variable, the result of the VECM is presented in Table 6.

Table 6: Result of Vector Error Correction Model Regression Test:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Co-Efficient (After Normalization)</th>
<th>Standard Error</th>
<th>T-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNMANU</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNGDP</td>
<td>4.85</td>
<td>0.34</td>
<td>14.47</td>
</tr>
<tr>
<td>INF</td>
<td>0.00</td>
<td>0.01</td>
<td>-0.69</td>
</tr>
<tr>
<td>IR</td>
<td>0.00</td>
<td>0.02</td>
<td>-0.13</td>
</tr>
<tr>
<td>LNEXRATE</td>
<td>-0.66</td>
<td>0.20</td>
<td>-3.25</td>
</tr>
<tr>
<td>LNMS2</td>
<td>-3.58</td>
<td>0.31</td>
<td>-11.73</td>
</tr>
<tr>
<td>UNEMPLOYR</td>
<td>0.19</td>
<td>0.03</td>
<td>7.45</td>
</tr>
</tbody>
</table>

Source: Authors Computation using E-Views 8.0(2017)

The estimated model is shown in equation 6
The equation (6) means that a positive relationship exists between manufacturing output to GDP and gross domestic product. This relationship is statistically significant at 5 percent since the absolute calculated t statistic (14.70) is greater than tabulated t-statistics (2.05 at df=28). A percentage increase in unemployment rate would result in an upward rise in LNMANU which is against the apriori expectation and both variables were statistically significant.

However, a negative relationship existed amongst inflation rate, interest rate, exchange rate and manufacturing output to GDP and all the three variables were not statistically significant with manufacturing output to GDP, LNMANU except exchange rate. Furthermore, an inverse relationship was portrayed between broad money supply and manufacturing output of GDP and both variables were statistically significant based on the absolute calculated t-statistic (11.73) being greater than tabulated t-statistics (2.05 at df=28). The R-squared is 0.77 means that approximately 77% of the variations in manufacturing output to GDP is explained by gross domestic product, inflation rate, interest rate, exchange rate, broad money supply and unemployment rate. The next in the estimation phase is the conduct of some post-estimation tests to check the validity of the model.

**Post-Estimation Tests:**

The results of serial correlation, autocorrelation of the residuals and heteroscedasticity tests are presented in the next sub-sections.

Serial Correlation (Breusch-Godfrey Lm) Test:
The result of the serial correlation test between the variables using the Breusch-Godfrey Lm test is in Table 7.

Table 7: Serial Correlation (Breusch-Godfrey LM) Test:

<table>
<thead>
<tr>
<th>F-statistic</th>
<th>0.12</th>
<th>Prob. F (2,25)</th>
<th>0.89</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obs*R-squared</td>
<td>0.32</td>
<td>Prob. Chi-Square (2)</td>
<td>0.85</td>
</tr>
</tbody>
</table>

Source: Authors computation using E-views 8.0 (2017)
The presence of serial correlation is confirmed since the chi-square probability value of 0.00 is less than the 5% significance level. The presence of autocorrelation in the residuals is tested next.

**Durbin Watson statistics Tests:**
This result of autocorrelation between the residuals is provided in Table 8.

<table>
<thead>
<tr>
<th>DW Value (d)</th>
<th>D-Upper ((d_u, \alpha))</th>
<th>D-Lower ((d_l, \alpha))</th>
<th>Decision Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.14</td>
<td>1.97</td>
<td>1.03</td>
<td>No Decision</td>
</tr>
</tbody>
</table>

Source: Authors computation using E-views 8.0 (2017)

The essence of the autocorrelation test is to ascertain if the error terms are interrelated over time. This test is beneficial for the immediate past period. Since the Durbin Watson \((d)\) value of greater than both the lower and the upper threshold values \((4 − d_u ≤ d ≤ 4 − d_l)\), the presence of autocorrelation result can be taken as being inconclusive.

**Heteroscedasticity (Breusch-Pagan) Tests:**
The absence of heteroscedasticity is one of the basic assumptions of OLS. The result of the heteroscedasticity is presented in Table 10.

<table>
<thead>
<tr>
<th>F-statistic</th>
<th>Prob. F ((6,27))</th>
<th>0.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obs*R-squared</td>
<td>18.54</td>
<td>Prob. Chi-Square ((6))</td>
</tr>
<tr>
<td>Scaled explained SS</td>
<td>42.93</td>
<td>Prob. Chi Square ((6))</td>
</tr>
</tbody>
</table>

Source: Authors computation using E-views 8.0 (2017)

After estimation, result shows that the Probability or P Value of the Obs* R-squared is 0.00 which is less than 5% significance level. In effect, the null hypothesis of heteroscedasticity that of the absence of heteroscedasticity, is not accepted. This means that some of the variables are not homoscedasticity. Notwithstanding the presence of heteroscedasticity, the OLS estimator although inefficient is still unbiased because according to Johnson (1972), the true variance and covariance are merely underestimated. This is because as proved by Gujarati and Porter (2009), only the dynamic conditional variances...
have been affected and not the unconditional variances. In addition, Fox (1997) as cited by Gujarati & Porter, (2009) except the problem is severe, there is no need to worry about unequal error variance. The model validity is not compromised.

Discussion of Findings:
An individual review of each macroeconomic variables shows disparate results as presented in turns.

GDP: The estimation result of this research is consistent with the findings of Onakoya (2014) with respect to the Kaldor (1966) proposition on the importance of manufacturing industry to the Nigerian economic growth in the long run. This corroborates the findings of Anaman and Osei-Amponsah (2009) in the quest for the determinants of the output of the manufacturing industry in Ghana from 1974 to 2006 reported a connection between manufacturing output and per capita real GDP in the long run. In similar vein, Amakom (2012) attributes the efficiency of a country’s economy to the strength of its manufacturing sector. Even with micro-level data, Fazio, Maltese and Piacentino (2011) who in Italy assessed the classic and augmented forms of Verdoorn's Law for both the manufacturing sector confirm increasing returns to scale at both levels. The rapidity of manufacturing sector growth as found out by Penélope and Thirlwall (2013) propels the economy on the path of accelerated positive growth because of increased share of the manufacturing sector (Thirlwall, 2013). The extent of growth is however queried by McCombie (1982) who submitted that short run constrictions including as labour and sectoral bottlenecks may hinder such growth.

Interest rate: The reduction in interest rates triggers inflation and affects the level of investment as people have more capital to purchase goods and services as captured in the liquidity and price puzzles of the Keynesian IS-LM framework. This study finds that in Nigeria, the high rate of interest level has deleteriously affected the manufacturing sectoral growth in line with Rasheed, (2010) who ascribed to high production cost. As for Okafor’s (2012) ominous prediction the performance level of Nigerian manufacturing companies will continually wane because of low budget implementation by government.
Inflation: The effects of lasting increases in the inflation rate and increased money supply for long-run activity appear very complex. The agreement about the adverse effect of inflation on real economic growth has explained little, leaving the greater part of the phenomenon undetermined. The negative and non-significant impact recorded by this study is consistent with the findings on non-linear connection between inflation and economic growth. In line with the findings of Li (2014), when rate of inflation is low, the association is insignificant or even positive to explicate the growth of output. At higher levels however, inflation generate a negative and significant impact on economic growth. In Nigeria the inflationary rates have been on the ascendancy. This in congruence with the result of the work of Tomola, Adebisi and Olawale (2012) exposed the significant adverse effect of high bank lending rates on capacity utilization and consequently the drop in the output of manufacturing companies in Nigeria.

Money supply: The Monetarists theory of inflation posits that increased money supply is effective for increasing the level of employment and production only in the short run and not in the long term. This is in similar to the findings of this research which finds an insignificant relationship between broad money supply and manufacturing output in the long run. The reason ascribed to this in theory is that although an expansionary monetary policy causes a rise in the production level and a reduction in the natural rate of unemployment, its effectiveness in the long run diminishes as the rigidities of production and distribution are evened out. The resultant inflation is the consequential effect of such expansionary policy in the long run.

Exchange rate: The impact of last global financial meltdown in 2009 examined by Loto (2012) was insignificant on the Nigerian manufacturing sector due in part to its relative small size. The result of this study is however in line with the findings of Enu and Havi (2014) in Ghana whose study results reveal negatively significant coefficient of log of real exchange rate (-0.32%) meaning that 1% rise in real exchange rate is related to a reduction of 0.32% in industrial output. Indeed, the inelastic real exchange rate in Ghana is similar to the (-0.66%) in Nigeria due in part to the overly dependence of imported raw materials and machinery required to keep the manufacturing sector going in the two developing economy.
Unemployment: The deduction from the third law of Kaldor also holds for this study with respect to the positive relationship between employments in manufacturing sector and manufacturing output growth. Indeed, 1 percent increase in employment is in tandem with 0.19 percent manufacturing growth. The question raised by Nickolas (2015) on how automated work upset structural unemployment rates is germane since this may lead to structural unemployment. It appears that the low level of industrialization and technology adoption in Nigeria may have accounted for the non-crowding out of low skilled workers. Akeju and Olanipekun (2014) and this research paper both concluded that the Okun’s law which stated a negative relationship existed between unemployment rate and economic growth was invalid in Nigeria.

Composite effect: A composite and dynamic discussion reveals that with an adjusted R-squared of 0.54, the identified variables accounted for fifty-four percent of the variations in the output of manufacturing sector in Nigeria. In congruence with the 2008 panel data study by Elhiraika on 36 African countries also deployed the vector error correction model and came to similar conclusions. The research by Amassoma and Nwosa, (2013) is also validated by this paper in terms of the short run and long run relationship and absence of short run relationship with manufacturing productivity and unemployment rate. The paper authored by Imoughele and Ismaila (2014) had similar results with this paper with respect to interest rate and exchange rate which were a negative relationship of the manufacturing contribution to GDP. It however departs from the findings of this study with negative broad money supply and inflation rate.

Managing the ‘five sisters’ – macroeconomic variables is more difficult than managing the impossible trinity (trilemma). There are conflicting interlinkages and spill-over effect. For example, inflation generates adversative effects on the Balance of Payment and the foreign exchange reserves. A high levels of domestic inflation may lead to spike in manufacturing production cost and over valuation of the rate of foreign exchange. Reduction in manufacturing output may arise from structural unemployment as a result of destructive innovation due new technological breakthrough.

Exchange rate policy regime fluctuation may lead to loss of confidence and consequential capital flight as experience in the Nigeria in 2016 and the first
half of 2017. These led to closure of factories as the dearth of foreign currency hindered the importation of requisite raw materials, machinery and spare parts for the industrial sector.

Conclusion
The focus of this research paper is to identify within an empirical framework, the relationship between manufacturing productivity and some macroeconomic variables, specifically the national output, rates of inflation, interest, exchange rate and of unemployment, in the context of the Keynesian IS-LM framework. The vector error correction model (VECM) was adopted based on the stationarity of the series at the first difference. The empirical findings in this study reflected the dynamics of the macroeconomic environment. Whereas the output of the manufacturing sector was positively and significantly related to both GDP and unemployment, it was had a negative but statistical insignificant relationship with inflation rate, interest rate, exchange rate. The presence of serial correlation, absence of homoscedasticity, inconclusive result on autocorrelation tests did not invalidate the robustness of the estimation model. The management of the macroeconomic variables is encapsulated in the fiscal and monetary policies. There is the need for these strands of economic policies to be harmonized if sustainable development is to be achieve. The discordant tunes from the fiscal and monetary authorities to the management of the current economic down turn in Nigeria further compounded the malaise. The Nigerian economy in 2016 went into recession, the first contraction since June 2004 (CITATION). Recession is defined as 'a slump in economy of a country for a minimum of two quarters of a year' (CITATION). Nigeria recorded negative GDP growth of -0.36%, -2.06%, -2.24% and -X.YY)% in the first quarter through to the last quarter of 2016. The weakened economy is caused primarily by a dependency on oil which provides over 75% of the national budgeted Revenue and over 90% of export earnings (CBN Statistical Bulletins, various years). It was manifested in visible wholesale-retail sales, industrial production and increased unemployment. The rate of interest rate for example, rose from in Q3 & Q4 from 12% to 15% coupled with an epileptic foreign exchange policy was contrary to the avowed policy of the fiscal authority to ‘spend our way' out of recession by expansionary government expenditure. This led to up-trended inflationary
throughout 2016 as evident increase consumer prices from 12.8% in March 2016 through 13.7% in April and 17.6% in September. Indeed the core inflation rate in Nigeria increased by 17.85% in January of 2017 over the correspondent period in 2016. Indeed, as at August 2016, about 4.58 million were unemployed. In ratio terms, the figure rose from 12.1% in quarter 1, through 13.3% in quarter 2 and 14% in quarter 3. As at November 2016, the ratio stood at 17.8% foreign direct investments and portfolio investments dropped by -23.75% and -9.49% respectively. Industrial output which stood at -10.1% in the first quarter of 2016 rose to 0.1% in the second quarter only to crash to -3.6% and -8.7% in the third and fourth quarters of 2016 respectively (Nigeria Industrial Production, 2007 to 2017) https://tradingeconomics.com/nigeria/industrial-production).

The Economic Recovery and Growth Plan (2017-2020) of the Nigerian government aimed at stabilizing the macroeconomic environment may be a panacea to this dichotomous planning malaise. However, as observed by Ajayi (2011), the low of the manufacturing sectoral output, can be blamed on poor budget implementation. The government will need to match it words with action by harmonizing both the fiscal and monetary policies in order to achieve sustainable growth and stable macroeconomic stability.

References:


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