IMPACT OF DOMESTIC PRICE LEVEL ON THE MANUFACTURING SECTOR IN NIGERIA (1981-2019)

BY

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BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF ECONOMICS, COLLEGE OF HUMANITIES MANAGEMENT AND SOCIAL SCIENCES, MOUNTAIN TOP UNIVERSITY.

IN PARTIAL FUFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE DEGREE IN ECONOMICS

AUGUST, 2021.

CERTIFICATION

I certify that this research project was conducted under my supervision by Ayodele John Oluwaferanmi (17020301001) at the Department of Economics, Mountain Top University, Ogun State, Nigeria.

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DEDICATION

This project is dedicated to GOD Almighty.

ACKNOWLEDGEMENTS

My gratitude first goes to God whose mercies and help saw me through completing this project. Through this phase, God utilized several persons that stood by me and came to my aid.

I am grateful to my family, Prof. and Dr. Ayodele, James, extended family members and Mr. Opeyemi Adeosun for their prayers and support. I thank my able head of department, who happens to also be my supevisor, Dr. M. M. OLOGUNDUDU. He put me through, helped me believe I could successfully do this project and alleviated my fears that surfaced when I discovered certain crucial data were unavailable at the start of the project. Now my inexperience is in the past. For his corrections and constructive criticisms while putting the project together. I am also thankful to Dr. Young, O. A. for always checking on me, being readily available to my aid and putting me through my econometric analysis.

Thank you to Dr. Olaniyi Clement, Dr. Olamade, Dr. Adedokun, Dr. Maku, Dr. Babasanya, Dr. Ojapinwa, Mr. O. O. Oluyomi for their academic assistance and advices. Thank you to all colleagues and friends. Above all, Daniella Oluseyi is the person for whom I am most thankful. I shall be eternally grateful to God for allowing me to meet such wonderful individuals. I pray God rewards everyone for the good they've done for me, in Jesus Name, Amen.

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ABSTRACT

This study investigated the impact of manufacturing price deflator on the Nigerian manufacturing sector, it also analyzed the impact of consumer price index on the manufacturing sector in Nigeria and assessed whether a positive or negative relationship exists between the GDP deflator and manufacturing output in Nigeria. This study spans a period of 1981 to 2019 while using time series data on relevant data in respect to the research objectives. Some of which are the implicit price deflator, manufacturing price deflator, manufacturing value added, real interest rate, monetary policy rate, consumer price index and so on. These data were collated across various sources, some of which include World Development Indicators (WDI), Central Bank of Nigeria statistical bulletin etc. data collected were analyzed using graphs, tables etc. This research employed the Auto Regressive Distributed Lag (ARDL) model, an estimation technique of that is, the, on which the stationarity of variables used were tested using the Phillip-Perron and Augmented Dickey-Fuller tests. Also, long run and short run relationship across various variables was determined using the bounds test approach to cointegration and the Error Correction form. Optimal lags for each model were determined using the VAR lag order selection criteria, which was determined by democracy. The results obtained from this research show that the relationship between the manufacturing price deflator and manufacturing sector is a negative one in both the short run and long run, conforming to a-priori expectations, although not significant in the short run Also, Consumer Price Index was found to have a negative relationship with the growth of the manufacturing sector in the short run, however, positive in the long run. It was seen that CPI is an insignificant determinant of occurrences in the manufacturing sector. The implicit price deflator was also seen to have a negative and non-significant effect on the manufacturing sector in the short run and long run. This study concludes that these variables are not significant contributors to the performance of the manufacturing sector, but detrimental.

Keywords: Manufacturing, Domestic Price Level, Inflation, Manufacturing Value Added, Manufacturing Price Deflator.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The state of health of any economy can be inferred from key macroeconomic variables and statistical figures. These variables include the likes of inflation, GDP growth, unemployment, and poverty rate, to mention a few. They tell whether an economy is in a boom or the recessionary phase of the business cycle or the extent to which it is developed. Unemployment, Inflation, and output level are among major macroeconomic indicators. They can cause or be influenced into changing by other variables.

Inflation reveals whether the currency of a nation has a strong or weak purchasing power, such that high inflation means weak purchasing power. Weak purchasing power signifies higher cost of living and lower standard of living. As a result, policy makers make it an objective to maintain low or single-digit inflation.

Alternatively, total output year on year reveals whether an economy is growing or not. Output is an aggregate of production from primary, secondary, and tertiary sectors of the economy. It is expected that the manufacturing sector contribute the most to output in order to achieve developed nation status. In other words, it is expected that a larger percentage of production come from the secondary sector, compared to the primary and tertiary sector. If not, such an economy will be extractive, agriculture and import driven commerce dependent. (Adejugbe, 2004, as sited in Aiyedogbon & Anyanwu, 2015). As a result, the importance of a viable and performing manufacturing sector cannot be over emphasized.

There exist exemplary nations that took the initiative and went through aggressive, unrelenting industrialization to become developed. The World Bank and Commission on Growth and Development have a report from 2008 that holds evidence of the sustained growth

in the economies of Japan, Brazil, Singapore, China, Republic of Korea, Thailand and Taiwan owning to manufacturing-led economic development. Their path emphasizes the necessity for the rejuvenation of the manufacturing sector in Nigeria. (Kalu, Paul, Christiana, Clementina, Regina, Foluso, Paul, 2019) South Korean and the Asian tigers (South Korea, Taiwan, serve as a better example as Nigeria at time was at the same level, if not better off than they were. However, today they are developed economies from shambles.

The Nigerian economy is plagued by various issues, one of which is an underperforming manufacturing sector. The economy of the country is reliant on oil. Crude oil extraction is one of the primary sector's many subsectors that generates the most revenue and contributes the most to GDP (Aliya & Odoh, 2016). Agriculture contributes the most to the primary sector, which accounts for a considerable amount of the gross domestic product. In comparison to the manufacturing sector, which accounts for just 9% of GDP as at 2019, the oil and gas sector provides 95% of the country's export revenues.

Following the discovery of oil in the late 1960s, the Nigerian economy began to face major challenges in expanding its industrial development. Many issues, such as reliance on oil for income, poor infrastructure, a paucity of trained labour, a lack of adequate financial resources, poor management and planning, and so on, contributed to the manufacturing sector's low growth and development from the late 1980s to the present. A significant characteristic of an economy that is largely underdeveloped is that the primary sector accounts for the majority of total output.

As stated earlier, this ought not be the case. Apart from, emphasis on crude oil, the Nigerian manufacturing sector is also characterized by poor financing, epileptic power supply, dilapidated and obsolete infrastructure, perennial security challenges, smuggling and massive importation of finished goods, ineffective policy execution, bad entrepreneurship, a lack of technological know-how, political instability, and corrupt government institutions (Chete,

Adeoti, Adeyinka & Ogundele, 2014). These are a number of challenges responsible for sectors underperformance and insignificant contribution to GDP. The effectiveness however of manufacturing industries in Nigeria is dependent on availability of resources such as raw materials, financial capability to fund investments in modern equipment, human resource development and technology (Adegbie & Adeniji, 2014). The Nigerian manufacturing sector is in dire need of a revamp.

Given the aforementioned, it is no surprise Nigeria is termed a developing nation. Explained further, low or insignificant contribution of the manufacturing output to GDP indicates an economy is underdeveloped. This means a larger part of total output comes from the primary and tertiary sector. United Nations Development Programme's (UNDP) classifies a nation as developing if it falls into the high, medium and low quartiles of the HDI percentile (i.e percentiles 51-75, 26-50, and 0-25 respectively). Nigeria falls into the High developing with a 53.9 percentile or 0.539 HDI score. Based on lower middle income. Based on World Banks classification system, Nigeria falls under the lower middle income, with a GNI per capita of $2,030 in 2019. In order to achieve developed nation status, it is cogent to invest heavily in the manufacturing sector.

Not enough study has been made on the relationship between macroeconomic determinants and factors that contribute to GDP, such as inflation and the manufacturing sector respectively. The industrial sector and manufacturing sector are important factors whose contribution to GDP matter. These factors when performing strongly, bring about economic growth, development and positive macroeconomic indicators that characterize a healthy developed economy. As such, it is expected that an association should exist between macroeconomic determinants of GDP and these factors.

Nigeria has recorded single digit manufacturing contribution to GDP for most of the past 60 years. With its most notable influence on GDP in the early 60's. There exist fluctuations

in the contribution of the manufacturing sector to GDP over the years. Could inflation in the economy have anything to do with this? Because of the importance of the manufacturing sector in a country's economic growth, the effect of inflation on the manufacturing sector has gotten a lot of attention in the literature throughout the years. Today, most countries of the world push for price stability as an overriding policy objective. Price stability is emphasized in the conduct of monetary policy with the goal of supporting long-term growth and development, as well as improving the buying power of the local currency.

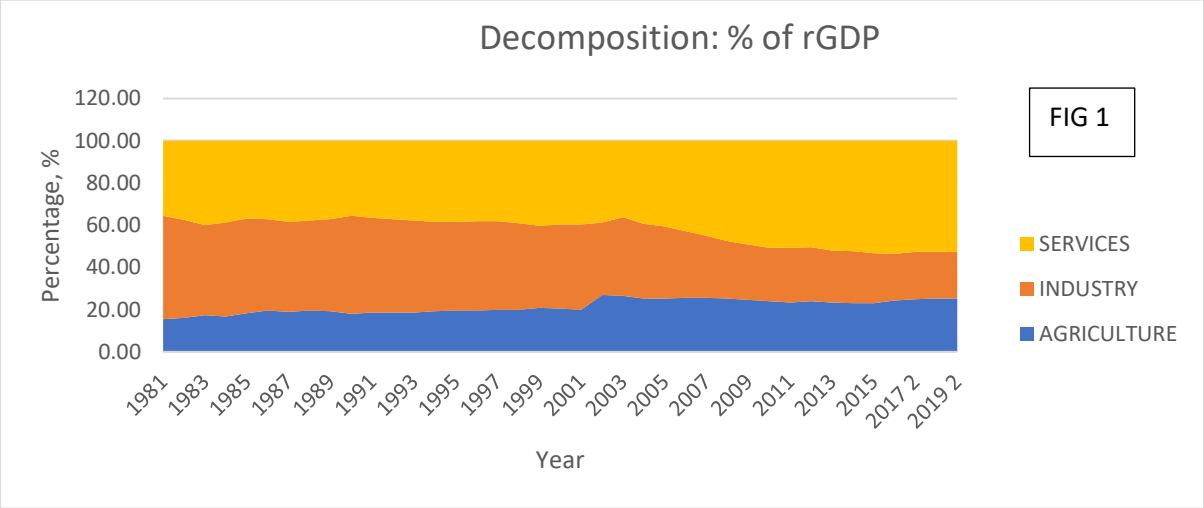
Globally, the rate of economic growth and the amount of inflation have been changing. Smoothing out the relationship between economic growth and inflation rate is one of the worst policy nightmares. It is argued that a study on the economy as a whole might not provide salient information on some sectors of the economy, which could have aided in policy making. Hence, we attempt in this discourse to fill this knowledge gap by examining the link between inflation and the manufacturing sector output in Nigeria. (Modebe & Ezeaku, 2016)

Romer put forward a relationship between manufacturing and economic growth. Given that economic growth is a subset of total output, factors that determine economic growth should affect manufacturing sector output (performance). Thus, this paper tries to determine if a relationship exists between the performance of the manufacturing sector and the level of domestic inflation.

1.2 Statement of the Problem

Economic growth and its relationship with factors (other variables) that may influence it, are probably the most studied relation by economists. Economic growth is the sustained increase in aggregate output (production of goods and provision of services) or rising real national income. Aggregate output (in the previous sentence), is the sum of products from the primary, secondary, and tertiary sectors. Manufacturing output is a subset of aggregate

output. It is part of the GDP sectorial decomposition and need be a larger percent of output in comparison to that of the primary and tertiary sector.



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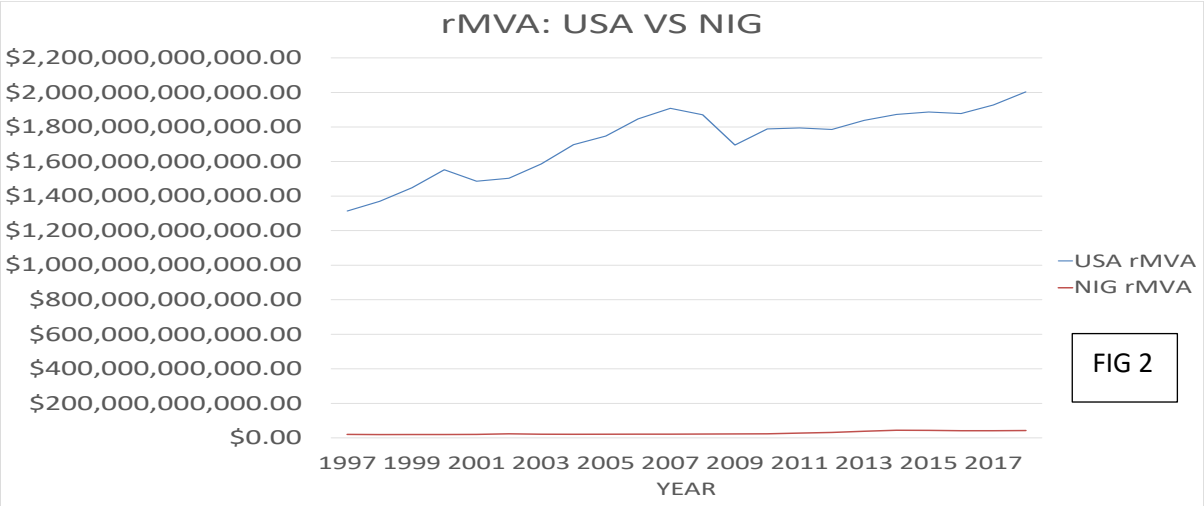
In Nigeria, reverse is the case. About 80% of export earnings come from the petroleum extractive sector. Thus, the Nigerian economy has existed as a fossil monolithic one for several decades, even till date. The major percentage of output and income, comes from the agrarian (primary sector). Followed by the commerce or retail of foreign produced goods (tertiary sector). Instead of the Nigerian manufacturing sector (secondary sector) being priority. This proves the sector to be underperforming.

Different Nigerian government regimes and administrations have aimed for industrialization or diversification of the economic base to little or no avail. Such strategies and policies focused on industrializing the economy, boosting economic growth and reducing poverty. Notable ones among these policies were the first (import substitution industrialization strategy (ISI) – 1962 to 1968), second (export promotion industrialization (EPI) strategy – 1970 to 1974), third (1975-1980), and fourth (1981-1985) industrial policies, the structural adjustment program (SAP – 1986), and the trade and financial liberalization. Despite these polices, the Nigerian manufacturing sector contributes

insignificantly to GDP most especially in comparison to the receipts and output of the oil sector. (Chete et al. 2014) Manufacturing sector contribution to GDP in Nigeria has been erratic and underperforming most of the timeline (as seen in fig.2).



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An underperforming manufacturing sector problem, based on theories and empirical study, would adversely affect the nation's welfare and development. Thus, it is tantamount to solve the problem of an underperforming manufacturing/industrial sector given its share potency to propel the economy into growth and development. It is paramount researches focus on factors responsible for low manufacturing (secondary) sector output. If these can be identified, economic growth and development become a stone throw

In contribution to the body of knowledge, a lot of work has been done as to discover if inflation has any effect on the overall output of an economy, i.e economic growth. These related studies have been undertaken in order to come up with theories and policies to attain sustainable economic growth. A more important determinant of economic growth is manufacturing output. If we can influence the right changes in the economy and enact the right policies to ensure a buoyant manufacturing sector, we can ultimately achieve economic growth and development in Nigeria.

Among all notable variables responsible for the underperforming manufacturing sector in Nigeria, how strong if any, is causality due to inflation? Not enough has been done to arrive at a consensus on the causal relation between inflation and the manufacturing sector. Most especially producer price index (PPI).

1.3 Objective of the Study

The broad objective of this study is to examine the impact of domestic price level on the manufacturing sector in Nigeria, while the specific objectives are;

1. To analyze the impact of manufacturing implicit price deflator on the Nigerian manufacturing sector.
2. To examine the impact of consumer price index on the manufacturing sector in Nigeria.
3. To investigate whether a relationship (positive or negative) exist between GDP deflator and manufacturing output.

1.4 Research Questions

To do justice to this study the following questions need to be answered;

1. How does MPD affect the manufacturing sector performance?

2. How does CPI affect the manufacturing sector performance?

3. How does GDP deflator impact manufacturing sector in Nigeria?

1.5 Research Hypothesis

In order to achieve the above objectives, the following null hypothesis are formulated:

H_{01}: Manufacturing Price Deflator (MPD) has no significant effect on manufacturing sector output in Nigeria

H_{02}: Consumer Price Index (CPI) has no significant effect on manufacturing sector in Nigeria

H_{03}: GDP deflator (IPD) has no significant effect on manufacturing sector output in Nigeria Manufacturing Price deflator (MPD)

1.6 Significance of the Study

This study brings value to many entities, walks of life and institutions. Individuals, businesses and investors will know how to adjust to business cycles for timely investment in the sector. It will provide policy makers with a glance understanding as to the relevance of price stability to the sector and necessary flaws to avoid in industrialization agenda. The authorities and government will understand the necessary tools to ensure long term growth trend and end fluctuations in the sector. It will ultimately serve as a reference for future studies.

1.7 Scope of the Study

This research will add to the body of knowledge by examining the link between price level (MPD and CPI), and growth in the Nigerian industrial sector from 1981 to 2019. The sources of data are from CBN Statistical Bulletin (2020) and World Bank Development Index (WDI). The choice of timeframe is due to data availability constraint.

1.8 Organization of the Study

This paper consists of five chapters. Chapter one contains the introductory context and background, statement of the problem, the basis of the study, the significance of the study etc. Chapter two is concerned with the theoretical and empirical review as to the relationship between inflation and the manufacturing sector. Chapter three discusses the methodology adopted for the research and relevant justifications. Chapter four will present empirical findings on how inflation impacts the manufacturing sector in Nigeria. It will also lay out the researcher's result of the analysis and the discussion of the findings. Chapter five presents the summary, conclusion of research findings and policy recommendations to attain a performing manufacturing sector.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter focuses on the conceptual review, theoretical review and empirical review on inflation and development related theories. There exists no theory that perfectly addresses a relationship between inflation and the manufacturing sector as little has been done in the past that focuses purely on inflation's impact on the manufacturing sector. The empirical findings have no consensus; thus, no theory as regards the relationship. The chapter centres on emphasizing existing works and studies that best explain a relationship between inflation and its impact on the manufacturing sector.

2.2 Conceptual Review

2.2.1 Concept of Inflation

Inflation is termed as the persistent increment in the general price level of a wide variety of goods and services in a certain economy over determined period. It is not a one-time increase in the price of a commodity or basket of goods, but must have been observed that the increasing prices be prolonged. That is why Piana (2001), attempts to separate inflation from the economic phenomena of a one-time price rise or price increases in a narrow range of economic goods or services. The traditional saying "inflation is too much money chasing too few commodities" reflects the basic connection between money and inflation. According to Hamilton (2001), inflation is an economic situation in which the money supply expands "faster" than new commodities and services are produced in the same economy.

The inflation rate is calculated using the percentage change in the price index (consumer price index, wholesale price index, producer price index etc). According to Essien (2002), the

consumer price index (CPI) evaluates the price of a typical basket of items and services purchased by the average consumer and is based on a quarterly survey of consumer prices. Changes in the price of various goods and services have variable degrees of influence on recorded inflation due to the differing weights in the basket.

As a price level indicator, the CPI has a variety of flaws. To begin with, it excludes machinery and other items and services acquired by enterprises and/or the government. Second, it does not take into consideration any potential changes in product quality over time. Finally, changes in the price of substitutable commodities are ignored. Finally, the CPI basket does not fluctuate much. Despite its shortcomings, the CPI is still the most often used measure of general price levels.

The GDP Deflator is another way to quantify inflation or price changes. This service is also offered on a quarterly and annual basis. It is, however, rarely employed as an inflation indicator. This is because the CPI measures the cost of living and is thus more suited for assessing people's well-being. CPI is also important for monetary policy objectives because it is released on a more frequent basis.

The neo-classical/monetarists, neo-Keynesians, and structuralists have been the three prominent schools of thought on the causes of inflation in recent years. According to neo-classical/monetarists, inflation is primarily caused by an increase in the quantity of money in circulation. However, the Federal Reserve's (Fed) practical experience in the United States (US) has demonstrated that this is not fully accurate. According to Hamilton (2001) and Colander (1995), the US money supply grows faster than prices. The growing demand for the US dollar as a worldwide trade currency has been attributed to this. Inflation, according to neo-Keynesians, is caused by declining returns to production. When the velocity of money rises and current consumption surpasses investment, this happens. Inflation, according to

structuralists, is caused by fundamental economic features (Adams, 2000). Individuals expect future prices to grow above present prices in emerging nations, particularly those with a large underground economy, and so demand for goods and services is not only transactional but also preventative. This generates fictitious shortages of products while also increasing inflationary pressures.

According to neo-Keynesians, there are three forms of inflation. The first type of inflation is demand-pull inflation, which happens when total demand exceeds available supply (capacity). Phillips curve inflation is another name for this phenomenon. A rise in government purchases, an increase in international price level, or an increase in money supply can all contribute to the output gap.

The second type is attributed to supply shocks. Here, inflation happens when aggregate supply is suddenly reduced due to an increase in the price/cost of a commodity/production for which there are no appropriate substitutes (Thomas, 2006). As seen by rising housing, energy, and food prices, this sort of inflation is becoming more frequent now than ever before. It is frequently represented in price/wage spirals in businesses, in which workers attempt to maintain their salaries in response to changes in the price level, while employers pass on the expense of increased costs to customers through price increases. Structural inflation is the third type and it is usually embedded in the economy (system), and influenced by monetary policy. Built-in inflation, also known as structural inflation, is caused by monetary policy changes.

Other forms of inflation with different drivers, consequences, and cures exist within these broad categories of inflation, which are characterized based on the degree, chronicity, and duration of the price increase. They are termed creeping/mild (2 – 3%), walking (3 - 4%), moderate (4 to 9%), chronic(15 – 30%), high (30 – 50%) and galloping/hyperinflation (50 - 100%).

In the literature, there are about six recognized inflation costs. Expenses of shoe leather, menu costs, unexpected increases in tax responsibilities, arbitrary wealth redistribution, uncertainty, and greater unpredictability of relative pricing are only a few examples. The shoe leather expenses arise when economic units have an incentive to keep their cash holdings to a minimum and prefer to keep it in interest-bearing accounts owing to currency depreciation. The menu costs of inflation itemize all of the annoyance that consumers and businesses encounter as price lists and price labels are revised on a regular basis. This diverts economic agents' attention away from more profitable endeavours. Rising inflation reduces a country's competitiveness in the global market for products and services by expanding the range of relative pricing. This has a detrimental impact on the balance of payments, which cannot be overstated.

2.2.2 Concept of Implicit Price Deflator

The implicit price deflator, or GDP deflator is an index which shows the magnitude of price increases or inflation in a given economy over a period of time under study or for analysis. This index is essentially one of three ways for calculating inflation in the economy. Comprehension the implicit price deflator requires understanding of two concepts: inflation and price index.

2.2.3 Concept of Manufacturing

The manufacturing sector refers to those industries that are engaged in producing and processing products and which either create new products or add value (Adebayo, 2010). It is a subset of the industrial sector of any economy. The industrial sector includes agriculture and mining and others from the primary sector, plus the manufacturing and other industries in secondary sector that add value to the earlier extracted products.

According to Dickson (2010), the manufacturing sector in industrialized nations makes up a large portion of the industrial sector. The end products might be finished goods that are sold to clients or intermediate goods that are utilized in the manufacturing process. Loto (2012) describes the manufacturing sector as a means of boosting productivity in terms of import substitution and export promotion, as well as establishing strong foreign exchange earning capacity, generate employment, and per capita income. According to Mbelede (2012), the manufacturing sector is involved in the process of converting raw materials into products, which adds value to them.

2.2.4 Concept of Manufacturing Output

Manufacturing output (MFQ) is the total newly fabricated or improved upon value added products in contribution to GDP from industries in the manufacturing sector of an economy. It is a pre-requisite for economic development. Ezekwe (1996), defined manufacturing output as the broad expansion of a developing country's manufacturing and productive system as the main requirement for high rates of present and future growth and development.

2.2.5 Concept of Manufacturing Value Added (MVA)

“The overall estimate of net-output of all resident manufacturing activity units derived by adding up outputs and deducting intermediary consumption is known as manufacturing value added (MVA).” (UNIDO).

2.2.6 Concept of Manufacturing Contribution to GDP

This is the percentage of GDP that the manufacturing sector output makes up. It is the ratio of manufacturing output to aggregate output.

2.2.7 Manufacturing Price deflator

The manufacturing price deflator measures the changes in prices of manufacturing goods produced in an economy. It is gotten by dividing the nominal manufacturing output figure by the value of real manufacturing output that same year.

2.3 Theoretical Review

2.3.1 Inflation-Growth Theories

There are various economic theories on the sensitivity or reaction of output growth to inflation, each with differing viewpoints. The supply-aggregate demand theory explains why inflation and output growth have a positive relationship. In other words, if output rises, so does inflation, and vice versa. (Modebe and Ezeaku, 2016). However, in the 1970s, the separate phenomena of stagflation (consistently high inflation combined with unemployment and stagnating demand for products and services in a country's economy) became well-known, and the validity of the previously suggested positive association was called into question. (Mbutor, 2014).

2.3.1.1 The Phillips Curve

Low unemployment and single digit inflation are two major macroeconomic objectives of policy makers, of which both often conflict. This trade-off between inflation and unemployment is explained by the Phillips curve. In 1958, A.W. Phillips, made an empirical finding, after plotting unemployment against rate of change of wage rates in the United Kingdom between 1861 and 1957. He discovered an indirect relationship between wage inflation and unemployment rates. This was strengthened by Paul Samuelson and Robert Solow fit of the Philips curve to the US economy between 1935 to 1959. Using American data, they found an inverse relationship between inflation (price) and unemployment. This is predicated

on the premise that salaries and prices move in lockstep. Milton Friedman would subsequently prove that it does not exist in the short run. The strength of the Phillips curve is that it indicates a statistically significant and empirically trustworthy relationship between inflation and unemployment. Thus, as inflation increases, unemployment decreases. This is because, as aggregate demand increases from adopted expansionary monetary or fiscal policy, aggregate supply increases, and unemployment reduces to meet demand. If potential output is being exceeded, as more factor inputs are employed

2.3.1.2 Monetarists View

Following on from Quantity Theory of Money (QTM), monetarists have argued that the amount of money is the primary determinant of price or value of the money to generate a precisely direct and proportionary change in price level in the quantity of money. The QTM may be traced back to a well-known Irving Fisher exchange equation: the MV = PQ where the stock is M, the velocity of the cash flow; the Q is the volume of transactions in the given time; whilst the P is symbolic of the overall price level in the economy. The equation of exchange becomes MV=PY by replacing Y (total quantity of goods and services exchanged for money) for Q. The introduction of Y creates a connection between the monetary and the real sector. P,V, and Y, on the other hand, are decided endogenously inside the model. While the policy variable M is determined exogenously by the monetary authorities. Monetarists highlight that any change in the quantity of money solely impacts the price level or the monetary side of the economy, leaving the real sector completely untouched. This means that changes in the money supply have no effect on the real output of goods and services, only on their values or exchange prices. The focus on long-run supply-side of the economy rather than short-run dynamics is an important component of the monetarists' model (Dornbush, et al, 1996).

2.3.1.3 The Keynesian

The monetarists' idea of a direct and linear relationship between the quantity of money and prices was challenged by the Keynesian. The link between changes in the quantity of money and prices, according to this school, is non-proportional and indirect, via the rate of interest. The Keynesian theory's strength is its integration of monetary theory on the one hand, and production and employment theory through interest rates on the other. When the money supply expands, the interest rate lowers, increasing the amount of investment and aggregate demand, therefore increasing production and employment. In other words, Keynesians view an economic phenomena that represents equilibrium in the goods and money markets as a connection between the real and monetary sectors of the economy (IS-LM). The Keynesian theory is also notable for interpreting the link between the quantity of money and prices in both unemployment and full employment scenarios. According to this theory, as long as unemployment exists, output and employment will fluctuate in the same proportion as money supply, but prices will remain unchanged. Changes in the supply of money, on the other hand, will cause a corresponding change in price at full employment. As a result, according to Olofin (2001), this method has the advantage of stressing that the goals of full employment and price stability may be intrinsically incompatible.

2.3.1.4 The Neo-Keynesian

Both aggregate demand and aggregate supply are included in the neo-Keynesian theoretical explanation. In the short term, it assumes a Keynesian viewpoint, but in the long run, it takes a classical viewpoint. Changes in government spending or the nominal money supply are considered, and expected inflation is assumed to be zero. As a result, aggregate demand rises in response to real money balances and falls in response to price changes. The neo-Keynesian theory emphasizes on productivity since falling productivity signals

diminishing returns to scale and, as a result, inflationary pressures, which are primarily caused by the economy's overheating and increasing output gap.

2.4 Empirical Review

There are few studies on the relationship between inflation and manufacturing sector performance, as the majority of the studies evaluated focused on the relationship between manufacturing sector performance and manufacturing capacity utilization, interest rate, exchange rate. However, the rare papers that were found have helped provide a template and insight on empirical analysis for this paper to achieve its objective. They include;

Ojeyinka and Adegboye (2017), based of their research results found inflation and exchange rate to both have negative effects on manufacturing sector growth over the 34-year period of time under investigation (1981-2014).

Bans-Akutey, Deh, and Mohammed (2016), examines the relationship between inflation and manufacturing sector productivity in Ghana during the period 1968 to 2013. Annual times series data of each variable for Ghana was used in for analysis. The empirical validation in this research was carried out via the use of the Johansen test (JT), Ordinary Least Squares (OLS) regression test and the Vector Error Correction Model (VECM), among other adoptations. The findings show that there is a statistically significant and sustainable long-run relationship between price level flunctuations and manufacturing sector productivity. The VECM, on the other hand, finds that there is a non-significant short-run relationship between inflation and manufacturing sector productivity. According to the findings of the OLS test, there is a statistically significant negative relationship between inflation and manufacturing sector productivity. According to the results, inflation has caused a decline in the productivity of the manufacturing sector.

Lawal (2016), examining the impact of exchange rate fluctuation on manufacturing sector output in Nigeria, asserted that long and short run relationship between exchange rate and manufacturing sector output. The findings revealed that the exchange rate has a positive relationship with the performance of the manufacturing sector, but that the relationship is not noteworthy statistically.

Afaha and Ologundudu (2014), conducted an empirical analysis of the macroeconomic determinants of industrial performance in Nigeria between 1979 to 2010 using co-integration and an error correction model. The study revealed that exchange rate and interest rate had negative effects on Nigeria's manufacturing sub-growth sector, which they attribute to a combination of factors. An increase in the manufacturing sub-index sector was also attributable to rising inflation, according to the analysts, who stressed that this should not be taken as sector real growth. They concluded long-run equilibrium existed between the variables in question, based of evidence of co-integration. In economic sense they put forward that liberalisation of the Nigerian economy encouraged manufacturing growth and progress throughout the time under consideration.

Odior (2013), ran an empirical analysis to investigate between 1975 and 2011, the effect macroeconomic variables had on the productivity on the manufacturing sector in Nigeria. After analysing the stochastic features of each time series by verifying their stationarity using the Augmented Dickey Fuller (ADF) test and estimating the error correction mechanism model (Dickey D.A. & Fuller W.A.1979),, he proceeded to the next step of his study. A long-run equilibrium relationship was established, as seen in the cointegrating equation of VECM. His findings lead him to conclude that credit to the manufacturing sector, in the form of loans and advances, and foreign direct investment have the potential to significantly increase Nigeria's level of manufacturing performance. And that the impact

of broad money supply on the manufacturing productivity will be too little to be considered significant.

Ehinomen and Oladipo (2012), revealed inflation and exchange rate as both being positively related to manufacturing gross domestic product in Nigeria. This is in contrast to the findings of Ojeyinka and Adegboye (2017).

According to Opaluwa, Umeh, and Abu (2010), the effect of exchange rate volatility on the Nigerian manufacturing sector during a twenty-year period (1986–2005) was investigated. To conduct the investigation, the econometric technique of regression was used. The estimated model was developed with the help of the e-views software programme. According to the findings of this research, volatility in the rate of exchange are not beneficial to economic activity in the manufacturing sector.Several factors, including technological underdevelopment, financial capital credit availability, high cost of foreign exchange for import of raw materials, equipment and machinery required for production, inadequacies in socio-economic infrastructure, technical man power scarcity, and foreign dominance, were discovered to have an impact on the manufacturing sector performance. These factors rendered currency devaluation ineffective.

Rasheed (2010) used co-integration and an error correction model to examine the productivity of the Nigerian manufacturing subsector. A long-run equilibrium relationship index for manufacturing industrial output, as well as determinants of productivity, interest rate spreads, inflation rates, foreign direct investment, and the quantity of graduate employment economic growth, bank credit to the manufacturing subsector, the exchange rate, are found in the study.

Elhiraika (2008), with the use of data from 36 African nations, conducted an empirical research on the influence of structural dynamics and transformation in the form of the

manufacturing share of total output. He investigated into variables that could be main drivers of manufacturing contribution to aggregate production, including its association with both real gross domestic product (GDP) growth and volatility in growth. Given that strong backward and forward linkages between manufacturing other sectors exist, the summary of the data analysis reveals that increasing the manufacturing contribution to total output has the potential to boost GDP growth, reduce growth volatility through accelerated growth, and reduce growth volatility. In addition, he put forward that e conomic transformation may be accelerated and economic and social development objectives, such as job creation and poverty reduction, can be achieved via the formulation and execution of appropriate industrial policies to encourage manufacturing.

Adebiyi and Babatope (2004) investigated the impact of institutions as well as other macroeconomic factors on the growth of Nigeria's manufacturing sub-sector. Having adopted ADF test and ECM, their results showed that, in addition to institutions, other macroeconomic factors influence the performance of the manufacturing sub-sector in Nigeria.

Adebiyi and Babatope (2004), same year, same authors, utilised cointegration to examine interest rate policy on the financing of the manufacturing subsector. However, their research results indicate cointegration or exsistence of long run relationship between Index Manufacturing Production, Credit to Manufacturing Subsector, Interest Rate Spread, Exchange Rate, Deficit Government Financing. and Inflation.

McKinnon (1973), Shaw (1973), and Fry (1982) claimed that financial deepening due to interest rate deregulation had a direct impact on factor productivity through increased real interest rates. There is a portfolio option, according to them, that redirects savings from self-financed investments with low-yield to higher yield financial assets. The significance of interest rates to the manufacturing subsector is best addressed in terms of the capital provision

it demands in the financing of the manufacturing subsector in Nigeria. Furthermore, McKinnon (1973) and Shaw (1973) emphasised the importance of internal and external finances in the development of the manufacturing sub-sector in developing countries, including Nigeria. While McKinnon emphasises the importance of internal finance, where investors must accumulate savings before obtaining lumpier capital goods, Shaw emphasises the importance of external finance and the development of manufacturing sub-sector in developing countries, including Nigeria.

Finding a general agreement seems to be extremely improbable, since results show that the nature of the connection between manufacturing and aggregate production growth to inflation varies by nation and also relies on the technique employed to establish such a relationship.

2.5 Gap in Literature

The literature review reveals little focus has been made on this study. And papers that have put forward determinant models of the sector performance, have no consensus as to the relationship. Different approaches were used by the different researchers as they tried to construct the best model to capture the hypothesised relationship. Previous works are yet to give clarity as to the relationship. Of the few papers that focus on the relationship between inflation and its effect on the manufacturing sector performance, none is yet to address the possibility of a significant lead if different measures of inflation are adopted. Especially producer price index (PPI), not just consumer price index (CPI) and GDP deflator. PPI notifies the cost of raw materials, which should influence output, in terms of quantity produced, unit price of quantity produced and duration a firm can continue to incur rising costs (PPI). If there exist this inflation, to what extent is this significant?

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The purpose of the study is to determine the impact of price level on the Nigerian manufacturing sector. Entailed in this chapter are, the theoretical framework, research design, data collection techniques, data analysis techniques and model specification.

3.2 Theoretical Framework

3.2.1 Monetary View on Inflation

The importance of money as the primary driver of demand-pull inflation is emphasized by monetarists.. The basic quantity theory of money provides the first explanation. The monetarists use Fisher's Equation of Exchange (MV= PQ), which is a well-known identity. Where M stands for money supply, V for money velocity, P for price level, and Q for real output level. Assuming that V and Q remain constant, the price level (P) changes proportionally with the money supply.

Monetarists believe that inflation is simply a monetary phenomena that can only be caused by increasing the money supply faster than capacity production growth. As a result, the present and previous rates of monetary growth are regarded as reflected in the actual rate of inflation at any particular moment, according to Humphrey. Nonmonetary explanations of inflation, such as shifts in autonomous private expenditures, government fiscal policies, cost-push influences, food and fuel shortages, and so on, are rejected by monetarists on the grounds that an increased stock of money per unit of output is required in all cases and thus constitutes the true cause of inflation.

The economy was thought to be at full employment due to flexible wages. Over time, the labor force, capital stock, and technology all evolved slowly. As a result, the amount of money spent had no effect on the level of real output, and twice the money supply resulted in double the price level. Households and firms would have excess cash until prices had increased by this amount, causing prices to rise.

As a result, inflation follows the expansion of the money supply. The aggregate supply is considered to be fixed in this study, and the economy is always at full employment. Naturally, increasing the money supply raises demand for products, but owing to full employment of resources, the supply of commodities cannot be increased. As a result, prices rise. True inflation, on the other hand, is caused by a constant and long-term increase in the money supply.

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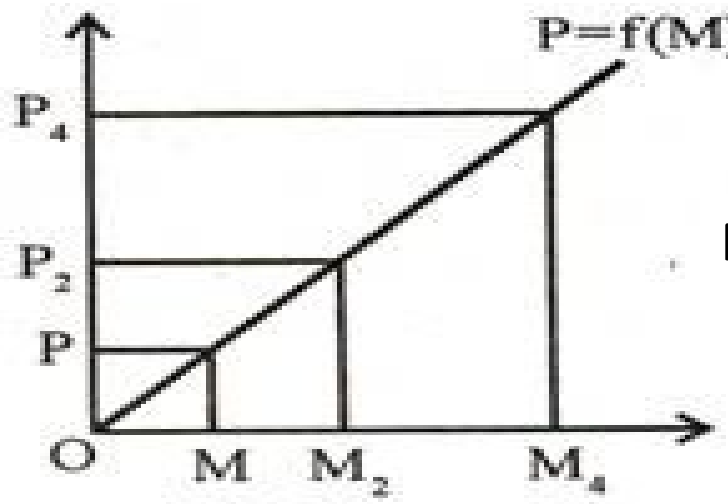

Fig. 3.

Fig 1

Source:view-source:https://www.yourarticlelibrary.com/macro-economics/inflation-macro-economics/monetarist-view-or-monetary-theory-of-inflation/31152 Your Article Library (2014)

Figure 1 (Fig 1) depicts the traditional theory of inflation, with the amount of money on the horizontal line and the price level on the vertical line. The price level is OP when the quantity of money is OM. When the amount of money doubles to OM2, the price level doubles to P2. Furthermore, when the money supply is multiplied by four to M4, the price level rises by four to P4. The curve P =f (M) from the origin at 45 degrees expresses this connection.

Excessive monetary expansion is believed to be the single necessary and sufficient condition for the genesis of inflation. “Inflation is always and everywhere a monetary phenomena in the sense that it is and can only be created by a faster rise in the amount of money than in the quantity of output” - Friedman (1970). The Monetary Theory Counter-Revolution.

3.2.2 Friedman’s View

Friedman and other modern quantity theorists believe that changes in the quantity of money will lead to changes in nominal income. Inflation occurs when people strive to spend their cash balances by increasing demand for goods and services. Because money demand is relatively steady, this excess spending is the result of an increase in the nominal amount of money given to the economy.

Following that, Friedman considers whether an increase in the money supply will boost production or prices first. When there is monetary growth, people's nominal income grows at first. Its immediate impact will be to raise labor demand. Workers will accept greater pay if it means a better quality of life. Prices and input costs will grow. Profit margins will be squeezed, and product prices will rise. People do not anticipate

prices to continue growing at first. They believe the price increase is only transitory and that prices would reduce in the future.

As a result, they tend to expand their money holdings, resulting in a price increase that is smaller than the nominal money supply increase. People's money holdings tend to rebalance over time. The price of goods rises faster than the money supply. Past pricing behavior, present changes in the organization of labor, product markets, and fiscal policy all influence the pace at which prices rise for a particular rate of increase in the money supply. As a result, monetary growth, according to Friedman, operates via production before inflation occurs.

3.2.3 Monetarist Tenets

a) Long-Run Stability (Near-Constancy) Of Velocity

The monetarist belief that inflation is caused exclusively or mostly by excessive monetary expansion leads to the proposal of a near-constant circulation velocity or rate of money turnover. Because if velocity were not constant, it would have a non-zero rate of change, which would act as a distinct and independent driver of inflation from monetary expansion. It is as follows. As a result, if monetarists claim that inflation is caused exclusively or largely by changes in the stock of money per unit of production, they must believe that velocity is at least a quasi-constant.

b) Exogeneity Of The Nominal Stock Of Money.

Monetarists consider money's amount and rate of growth to be variables with fixed magnitudes outside the system. 3 This viewpoint contrasts starkly with the nonmonetarist concept of money as an endogenous variable determined by the amount of economic activity and public preferences for money and liquid-asset money

substitutes inside the system. According to the exogeneity hypothesis, monetary growth enters the system as a datum for determining expenditure, pricing, and nominal income growth rates. As a result, the postulate is compatible with the monetarist view of monetary growth as an independent causal factor that governs inflation rate.

c) Absence Of Reverse Causality Running From Income To Money.

The monetarist concept of the unidirectional channel of influence or flow of causation going from money to spending to income to prices is implied by the exogeneity requirement, which rejects the notion of passive income-determined monetary growth. Monetary growth is regarded as an active independent variable that precedes and produces inflation, rather than as a dependent or accommodating variable responding passively to past income increase. True, monetarists accept that income may impact money indirectly through policymakers' reactions to economic developments in their asides and qualifiers. However, they have generally ignored such policy response functions in their formal models and continue to see monetary policy as primarily exogenous. However, they have generally ignored such policy response functions in their formal models and continue to see monetary policy as primarily exogenous.

3.2.4 AD - AS Model

The Aggregate Demand (AD) - Aggregate Supply (AS) Model helps best depict the Monetarist pesperctive of inflation. It is displayed below in figure 2 (Fig 2).

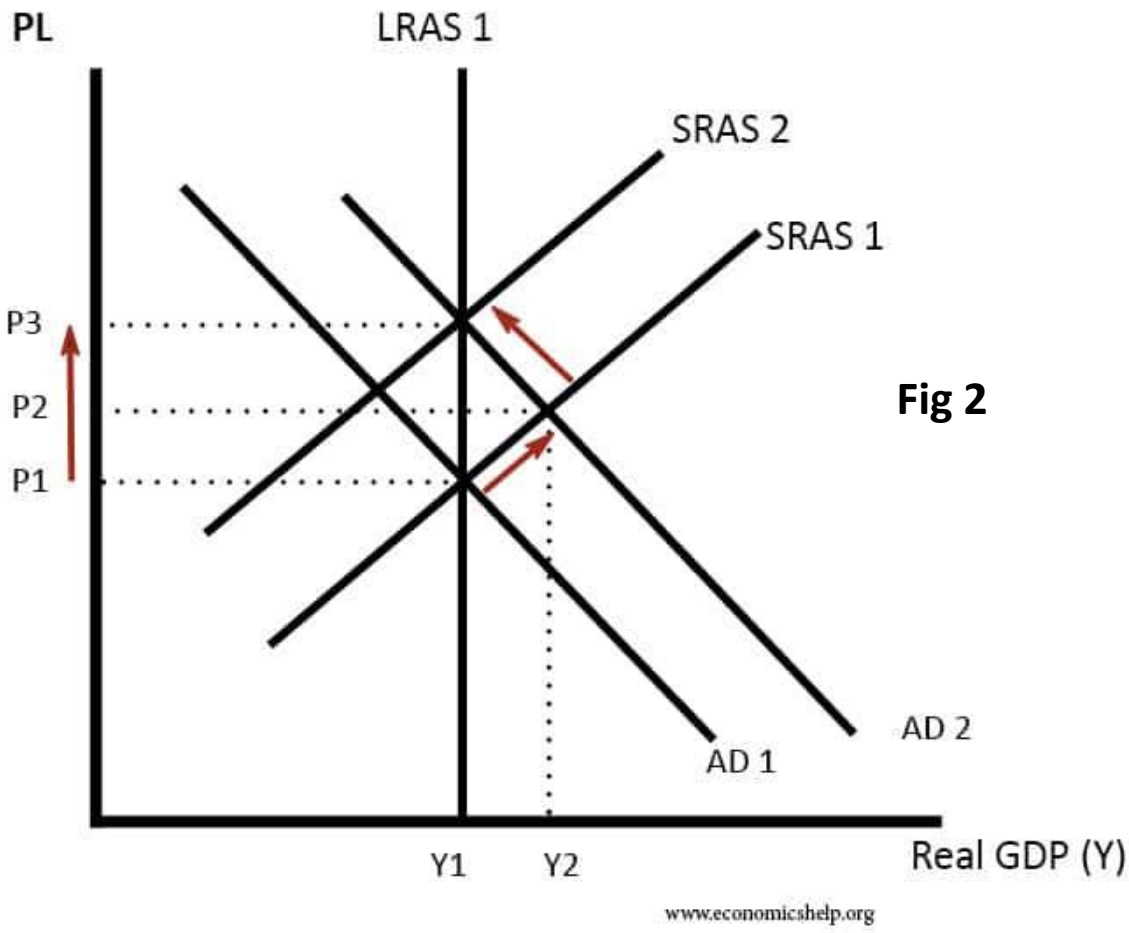

Fig 2

Consumers have more money when the Money Supply rises, so they spend more money on products, shifting AD to the right. From AD 1 through AD 2, Firms increase production along the SRAS in response. From Y1 to Y2, real production rises. National output has now surpassed the equilibrium level. As a result, an inflationary gap exists.

Salaries grow when firms need to hire more employees, leading costs to rise and, as a result, prices to rise. Because their nominal compensation is growing, workers first agree to work greater hours. As prices rise, money can buy less, resulting in a movement to the left along the new AD. Workers also understand that a nominal wage rise does not equate to a real wage increase. As a result, employees want higher nominal salaries in order to generate more production and compensate for rising prices, shifting SRAS

to the left. The economy has reached its output equilibrium (Y1), albeit at a higher price level (P3). As a result, an increase in the Money Supply causes an increase in AD. However, because the LRAS is inelastic, no increase in actual production occurs, but inflation does. It's a type of inflation that's driven by consumer demand.

Monetarists believe that inflation and unemployment have no traded off in the long run. A rise in the money supply boosts nominal GDP but not actual GDP.

3.3 Research Design

This study employed the ex post facto research design and the time series annual secondary data was used for this study. A quasi-experimental research investigates how an independent variable, present until the study impacts a subject variable is an expost influence, which means "from what is achieved afterwards." Quasi-experimental study is a design in which an explanatory variable is managed but group participants are not allocated arbitrarily as per the parameters. In field settings where random allocation is either irrelevant or not required, quasi-research was used.

Ex post facto study design is the method in which the predictor variables have already been established. The researchers begin by analysing a dependent variable, and then retrospect their potential relationship to and effects on the dependent variable by examining the independent variables. The choice of time series focuses on the fact that the data used in this analysis has been obtained over a period of time and is intended to examine the impact of inflation on the Nigerian manufacturing sector performance. The study used ex-post facto research design and ordinary least square regression to analysed data. The reason for using ex-post factor research design is the use of historical data from secondary sources.

3.4 Sources of Data Collection

Data for this study is secondary data, and were extracted from Central Bank of Nigeria Statistical Bulletin (2020) and World Development Indicators (WDI) of the World Bank. Data was also gotten from the National Bureau of Statistics (NBS) website.

3.5 Data Analysis Technique

The descriptive statistics, chart, graphs were adopted to meet the first objective. To achieve the second and third objective, the Autoregressive Distributed-lag (ARDL) and Toda-Yamamoto respectively were adopted for data analysis. WDI was used in the study as the dependent variable and inflation (represented by deflated as the independent variables. The study adopts time series data from 1981 to 2019. The data were obtained from the publications of the Central Bank of Nigeria Statistical Bulletin, WDI, National Bureau of Statistics. The e-view statistical software was adopted.

Estimation Techniques adopted are under quantitative analysis method. Objective one, two and three were achieved using Autoregressive Distributed Lag (ARDL). This model requires unit root test, lang length determination. The Augmented Dickey-Fuller (ADF) and the Phillips Perron (PP) tests were used in going about the unit root test to determine the stationarity of the variables. The significance level for the in this study is pegged at 5%.

Furthermore, determining the lag length of the ARDL model is a vital element in the specification of ARDL models. In order to select the appropriate lag length, the information criteria such as the Hannan-Quinn Information Criteria (HQ), the Akaike Information Criteria (AIC), the Schwarz Information Criteria (SIC), the Log Likelihood (LL) and the Final Prediction Error (FPE) were therefore considered following the literature.

In addition, the study used the recently developed ARDL (Auto Regressive Distributed Lag) bound testing technique, which was initially introduced by Pesaran and Shin (1998) and further extended by Pesaran et al (2001), to investigate whether or not the variables are co-integrated or possess a long-term equilibrium relationship. Compared to other cointegration procedures, this method has certain econometric advantages. First, it is relevant regardless of the degree of inclusion of the factors (i.e. whether the underlying factors are solely I(0), I(1) or mix of the two) and thus prevents pre-testing the order of inclusion of the factors. Second, the model's long-run and short-run parameters are estimated at the same time as it takes into account the lagged period of error correction. Third, for small sample sizes, the ARDL strategy is more robust and works better. Fourth, this method usually offers unbiased long-run model estimates and valid t-statistics even if some regressors are endogenous (Harris and Sollis, 2003). Inder (1993) and Pesaran and Pesaran (1997) have shown that endogeneity bias can be corrected by the incorporation of dynamics. Fifth, once the order of the lags in the ARDL model has been appropriately selected, a simple Ordinary Least Square (OLS) method can be used to estimate the cointegration relationship.

In view of the above advantages, for objective one the ARDL-UECM version of the model, equation (2) if further expressed as

3.6 Model Specification

The model specification expresses the mathematical relationship between the dependent variable in the model and the independent variables. The model for this research would examine the relationship between inflation and the manufacturing sector performance in Nigeria. It also consists of other determinants of manufacturing output, growth and performance, in order to make inferences that are up to date for future studies. The formulation

below was employed by Tomola Marshal Obamuyi, Adebisi T. Edun, Olawale Femi Kayode (2009).

Broad Objective:

$$\boldsymbol{MVA = f(INF)}$$

Factoring other independent (exogeneous) variables

$MVA = f(INF, INT, \text{EXR}, M2, FDI)$

$$MVA_t = \alpha_0 + \alpha_1 INF_t + \alpha_2 INT_t + \alpha_3 EXR_t + \alpha_4 M2_t + \alpha_5 FDI_t + \varepsilon_t$$

In order to achieve the objective one, the following equation need be estimated in this study:

$MVA = f(MPD, rINT, EXR)$ eqn (1)

Converting the equation to an econometric model, we have;

$MVApg_t = \alpha_0 + \alpha_1 MPDpg_t + \alpha_2 rINT_t + \alpha_3 EXR_t + \varepsilon_t$ eqn (2)

To achieve objective two, in order to determine the impact of consumer price index on the manufacturing sector performance, it is important the following equation be estimated;

$MVA = f(CPI, M2, INT)$ eqn (i)

Converting the equation to an econometric model, we have;

$MVApg_t = \beta_0 + \beta_1 CPI_t + \beta_2 M2pg_t + \alpha\beta_3 INT_t + \varepsilon_t$ eqn (ii)

To achieve the third objective of this study, i.e to determine whether a positive or negative relationship exist between GDP deflator and manufacturing output, will require the following equation to be estimated;

$$MVA = f(IPD, FDI, PLR) \qquad \text{eqn (a)}$$

Converting the equation to an econometric model, we have;

$$MVApg_t = \omega_0 + \omega_1 IPDpg_t + \omega_2 FDI_t + \omega_3 PLR_t + \varepsilon_t \qquad \text{eqn (b)}$$

Where: MVA is Manufacturing Value Added which is a proxy for manufacturing output, EXR represents Exchange Rate, FDI represents Foreign Direct Investment, M2 represents broad Money Supply, while Real Interest Rate (rINT), Prime Lending Rate (PLR) and Interest rate (INT) are proxies for Interest Rate, and Consumer price index (CPI), implicit price deflator (IPD), and Manufacturing Implicit Price Deflator (MPD) are proxies for Inflation Rate (INT).

The ARDL form of equations (2), (ii) and (b) are specified as follows:

For Objective one;

- $\Delta \ln MVA_t = \alpha_0 + \sum_{i=0}^{a} \alpha_1 \Delta \ln CPI_{t-i} + \sum_{i=1}^{b} \alpha_2 \Delta \ln INT_{t-i} + \sum_{i=1}^{c} \alpha_3 \Delta \ln EXR_{t-i} + \sum_{i=1}^{d} \alpha_4 \Delta \ln MLR_{t-i} + \beta_1 \ln CPI_{t-1} + \beta_2 \ln INT_{t-1} + \beta_3 \ln EXR_{t-1} + \beta_4 \ln MLR_{t-1} + \varepsilon_t$

For Objective two;

- $\Delta \ln MVA_t = \gamma_0 + \sum_{i=1}^{a} \gamma_1 \Delta \ln IPD_{t-i} + \sum_{i=1}^{b} \gamma_2 \Delta \ln M2_{t-i} + \sum_{i=1}^{c} \gamma_3 \Delta \ln FDI_{t-i} + \mu_1 \ln IPD_{t-1} + \mu_4 \ln M2_{t-1} + \mu_5 \ln FDI_{t-1} + \varepsilon_t$

For Objective three;

- $\Delta \ln MVA_t = \theta_0 + \sum_{i=1}^{a} \theta_1 \Delta \ln PPI_{t-i} + \sum_{i=1}^{b} \theta_2 \Delta \ln CMS_{t-i} + \sum_{i=1}^{c} \theta_8 \Delta \ln BLR_{t-i} + \omega_1 \ln PPI_{t-1} + \omega_2 \ln CMS_{t-1} + \omega_3 \ln BLR_{t-1} + \varepsilon_t$

3.7 Estimation Techniques

The technique adopted for estimating data is the Auto-regressive Distributed Lag (ARDL) model. The use of the ARDL model is for the estimation of the level of relationships because the model suggests that once the order of the ARDL is determined, Ordinary Least Square Technique can estimate the relationship. The ARDL model is used for providing reliable estimates of the long-run coefficients which are asymptotically normal regardless of whether the regressors are I(0) or I(1). It is also efficient for small sample data.

3.8 Justification of the Variables

The variables for the analysis were selected based on the date and purposes of the research. Each section describes the study's dependent and independent variables as follows:

3.8.1 Dependent Variables

The dependent variable in this study is Manufacturing Value Added.

3.8.2 Independent Variables

These variables include Exchange Rate (EXR), Interest Rate (INT), Real Interest Rate (rINT), Broad Money Supply (M2), Foreign Direct Investment (FDI), Prime Lending Rate (PLR), maximum lending rate (MLR), consumer price index (CPI), GDP Deflator/ Implicit Price Deflator (IPD), Manufacturing Output Price Deflator (MPD).

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This section analysed and evaluated secondary data gotten from the Central Bank statistical Bulletin and the World Bank Development Indicators Data, spanning from 1981 to 2019. Tables are used to display the retrieved data and figures in a format easy for comprehension at first glance. The hypothesis that was tested is also included.

4.2 Unit Root Test

Using the Augmented Dickey-Fuller (ADF) test and the Phillip and Perron (PP) test, unit root test techniques were used to analyse the time series of the concerned variables (Consumer price index (CPI), exchange rate (EXR), foreign direct investment (FDI), implicit price deflator percentage growth rate (IPDgr), interest rate (INT), broad money supply (M2pg), manufacturing implicit price deflator (MPD), manufacturing value added percentage growth rate (MVApg), prime lending rate (PLR), real Interest Rate (rINT)) in this study. Stationarity of variables under this study is a criteria for ARDL. Thus, it crucial to ensure all variables in the models are stationary, since most macroeconomic time series exhibit non-stationary behaviour, leading to questionable results and inferences. The ADF result can be seen in as displayed in Table 4.1, while PP results are presented Table 4.2. Both ADF and PP tests reveal all the variables and the level at which they are stationary. It could be stationary at intercept or intercept and trend at level (I0) or first difference (I1).

From table 4.1, for intercept only, EXR and PLR are the only two variables which at level were found to be non-stationary. The decision rule is that, the p-value should be

significant and more importantly for this study, the T-statistics should be greater than the 5% significant level value in absolute terms. Every other variable conformed with the decision rule and were stationary at level represented by, I(0). At first difference, intercept only, CPI and M2pg were non-stationary and thus tagged, (NS) since their ADF (Test) statistics values were less than their corresponding critical values in absolute terms. For the PP test, at intercept only, EXR was the only variable that was non-stationary at level, while CPI was the only non-stationary variable at first difference, as seen in table 4.2.

For The result of the ADF test for trend and intercept, results from table 4.1 shows that 5 variables (i.e CPI, FDI, MVApg, PLR, rINT) are stationary at level (integrated of order zero). While at first difference, CPI is the only variable that is non-stationary. CPI has an insignificant p-value of 0.7895 and a test statistic of -1.5598 which in absolute terms is less than the 5% critical value of -3.5366. Thus, every other variable could be termed to be integrated of order one. The PP test results on the other hand, as seen in table 4.2, regarding intercept and trend, majority of the variables (EXR, IPDpg, M2pg, MPDpg and PLR) are not stationary. While at first difference, all variables were stationary except CPI.

All in all, variables met the criteria of stationarity as all variables were on way or the other integrated at order zero or one. Variables that were initially non-stationary at level and first difference were transformed into their percentage growth rates in order for them to become stationary.

Table 4.1: Augmented Dickey-Fuller (ADF) Test Result

Augmented Dickey Fuller Test (intercept only)												
	Level						First difference					
Variable	ADF Statistic	Critical Values			Prob.	Remarks	ADF Statistic	Critical Values			Prob.	Remarks
		1%	*5%	10%				1%	*5%	10%		
CPI	4.6976	-3.6268	-2.9458	-2.6115	1.0000	I(0)	0.2949	-3.6210	-2.9434	-2.6103	0.9749	NS
EXR	1.4000	-3.6156	-2.9411	-2.6091	0.9987	NS	-4.2576	-3.6210	-2.9434	-2.6103	0.0018	I(1)
FDI	-3.9334	-3.6156	-2.9411	-2.6091	0.0043	I(0)	-8.0198	-3.6210	-2.9434	-2.6103	0.0000	I(1)
IPDpgr	-3.1779	-3.6210	-2.9434	-2.6103	0.0294	I(0)	-7.3678	-3.6268	-2.9458	-2.6115	0.0000	I(1)
INT	-3.2642	-3.6156	-2.9411	-2.6091	0.0238	I(0)	-8.5695	-3.6210	-2.9434	-2.6103	0.0000	I(1)
M2pg	-3.4338	-3.6210	-2.9434	-2.6103	0.0160	I(0)	-3.4440	-4.2268	-3.5366	-3.2003	0.0609	NS
MPDpgr	-3.2874	-3.6210	-2.9434	-2.6103	0.0228	I(0)	-3.8782	-3.6394	-2.9511	-2.6143	0.0055	I(1)
MVApg	-4.5469	-3.6210	-2.9434	-2.6103	0.0008	I(0)	-8.6817	-3.6268	-2.9458	-2.6115	0.0000	I(1)
PLR	-2.4833	-3.6268	-2.9458	-2.6115	0.1278	NS	-6.0867	-3.6268	-2.9458	-2.6115	0.0000	I(1)
rINT	-7.2683	-3.6156	-2.9411	-2.6091	0.0000	I(0)	-9.8216	-3.6210	-2.9434	-2.6103	0.0000	I(1)

Augmented Dickey Fuller Test (Intercept and Trend)												
	Level						First difference					
Variable	ADF Statistic	Critical Values			Prob.	Remarks	ADF Statistic	Critical Values			Prob.	Remarks
		1%	*5%	10%				1%	*5%	10%		
CPI	3.7767	-4.2350	-3.5403	-3.2024	1.0000	I(0)	-1.5598	-4.2268	-3.5366	-3.2003	0.7895	NS
EXR	-2.0798	-4.2268	-3.5366	-3.2003	0.5396	NS	-4.5046	-4.2268	-3.5366	-3.2003	0.0049	I(1)
FDI	-3.8512	-4.2191	-3.5331	-3.1983	0.0244	I(0)	-7.9731	-4.2268	-3.5366	-3.2003	0.0000	I(1)
IPDpgr	-3.4170	-4.2268	-3.5366	-3.2003	0.0645	NS	-3.1779	-3.6210	-2.9434	-2.6103	0.0000	I(1)
INT	-3.2425	-4.2191	-3.5331	-3.1983	0.0916	NS	-8.5154	-4.2268	-3.5366	-3.2003	0.0000	I(1)
M2pg	-3.4440	-4.2268	-3.5366	-3.2003	0.0609	NS	-6.4370	-4.2350	-3.5403	-3.2024	0.0000	I(1)
MPDpgr	-3.2782	-4.2436	-3.5443	-3.2047	0.0866	NS	-3.8228	-4.2529	-3.5485	-3.2071	0.0274	I(1)
MVApg	-4.7534	-4.2268	-3.5366	-3.2003	0.0026	I(0)	-8.6802	-4.2350	-3.5403	-3.2024	0.0000	I(1)
PLR	-5.1238	-4.2627	-3.5530	-3.2096	0.0012	I(0)	-6.2876	-4.2350	-3.5403	-3.2024	0.0000	I(1)
rINT	-7.4756	-4.2191	-3.5331	-3.1983	0.0000	I(0)	-9.5889	-4.2268	-3.5366	-3.2003	0.0000	I(1)

Source: Author's Compilation from Eviews 10 (2021)

Table 4.2: Philip-Perron (PP) Test

Philip Perron Test (intercept only)												
Variable	Level						First difference					
	PP Statistic	Critical values			Prob.	Remarks	PP Statistic	Critical Values			Prob.	Remarks
		1%	*5'	10%				1%	*5'	10%		
CPI	19.2157	-3.6156	-2.9411	-2.6091	1.0000	I(0)	1.2452	-3.6210	-2.9434	-2.6103	0.9979	NS
EXR	1.3487	-3.6156	-2.9411	-2.6091	0.9984	NS	-4.1577	-3.6210	-2.9434	-2.6103	0.0024	I(1)
FDI	-3.8587	-3.6156	-2.9411	-2.6091	0.0053	I(0)	-13.9820	-3.6210	-2.9434	-2.6103	0.0000	I(1)
IPDpg	-3.1779	-3.6210	-2.9434	-2.6103	0.0294	I(0)	-10.3083	-3.6268	-2.9458	-2.6115	0.0000	I(1)
INT	-3.2209	-3.6156	-2.9411	-2.6091	0.0264	I(0)	-8.9727	-3.6210	-2.9434	-2.6103	0.0000	I(1)
M2pg	-3.1773	-3.6210	-2.9434	-2.6103	0.0295	I(0)	-11.9993	-3.6268	-2.9458	-2.6115	0.0000	I(1)
MFPd	-3.2874	-3.6210	-2.9434	-2.6103	0.0228	I(0)	-8.3239	-3.6268	-2.9458	-2.6115	0.0000	I(1)
MVApg	-4.5469	-3.6210	-2.9434	-2.6103	0.0008	I(0)	-10.4226	-3.6268	-2.9458	-2.6115	0.0000	I(1)
PLR	-3.5507	-3.6156	-2.9411	-2.6091	0.0118	I(0)	-9.7797	-3.6210	-2.9434	-2.6103	0.0000	I(1)
rINT	-7.0445	-3.6156	-2.9411	-2.6091	0.0000	I(0)	-28.0615	-3.6210	-2.9434	-2.6103	0.0001	I(1)

Philip Perron Test (Intercept and Trend)												
Variable	Level						First difference					
	PP Statistic	Critical values			Prob.	Remarks	PP Statistic	Critical Values			Prob.	Remarks
		1%	*5%	10%				1%	*5'	10%		
CPI	8.6885	-4.2191	-3.5331	-3.1983	1.0000	I(0)	-1.2324	-4.2268	-3.5366	-3.2003	0.8887	NS
EXR	-1.5110	-4.2191	-3.5331	-3.1983	0.8082	NS	-4.2484	-4.2268	-3.5366	-3.2003	0.0095	I(1)
FDI	-3.7635	-4.2191	-3.5331	-3.1983	0.0299	I(0)	-17.9881	-4.2268	-3.5366	-3.2003	0.0000	I(1)
IPDpgr	-3.4283	-4.2268	-3.5366	-3.2003	0.0630	NS	-10.2958	-4.2350	-3.5403	-3.2024	0.0000	I(1)
INT	-3.1663	-4.2191	-3.5331	-3.1983	0.1064	NS	-8.6425	-4.2268	-3.5366	-3.2003	0.0000	I(1)
M2pg	-3.0721	-4.2268	-3.5366	-3.2003	0.1277	NS	-14.9453	-4.2350	-3.5403	-3.2024	0.0000	I(1)
MPDpg	-3.3904	-4.2268	-3.5366	-3.2003	0.0682	NS	-8.2204	-4.2350	-3.5403	-3.2024	0.0000	I(1)
MVApg	-4.7307	-4.2268	-3.5366	-3.2003	0.0027	I(0)	-11.8102	-4.2350	-3.5403	-3.2024	0.0000	I(1)
PLR	-3.3526	-4.2191	-3.5331	-3.1983	0.0733	NS	-10.0657	-4.2268	-3.5366	-3.2003	0.0000	I(1)
rINT	-7.1658	-4.2191	-3.5331	-3.1983	0.0000	I(0)	-29.8300	-4.2268	-3.5366	-3.2003	0.0000	I(1)

Source: Author's Compilation from Eviews 10 (2021)

4.3 Lag Length Order Selection Criteria

After all variables in the model have been ensured stationary, the next criteria and step in order to adopt ARDL model is to determine the lag length. To avoid misspecification and loss of degrees of freedom, it is important to first determine the correct lag length. VAR lag order selection criteria includes the Akaike information criteria (AIC), the Schwarz information criteria (SC), Hannan-Quinn information criteria (HQ), Log Likelihood (LL), and Final Prediction Error (FPE). All criteria were taking into consideration as lag length for the models is decide on the basis of democracy (majority), i.e the lag length that the most criteria recommended was the choice lag length. Hence, objectives 1, 2, and 3 will follow a lag length of order of one. The result is shown in table 4.3, which illustrates the VAR's optimal lag structure for objectives 1,2, and 3.

Table 4.3: Optimal Lag Length Selection

LAG LENGTH CRITERIA SELECTION FOR OBJECTIVE ONE						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-619.6124	NA	1.31E+10	34.64513	34.82108	34.70654
1	-545.7696	127.1738*	5.29e+08*	31.43164*	32.31138*	31.73869*
2	-532.3179	20.17745	6.32E+08	31.57322	33.15674	32.12591
LAG LENGTH CRITERIA SELECTION FOR OBJECTIVE TWO						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-588.0902	NA	2.27E+09	32.8939	33.06985	32.95531
1	-450.3474	237.2236*	2639585.*	26.13041*	27.01014*	26.43746*
2	-436.039	21.4626	3006190	26.22439	27.80791	26.77708
LAG LENGTH CRITERIA SELECTION FOR OBJECTIVE THREE						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-427.5312	NA	303308.1	23.97396	24.14990*	24.03537*
1	-411.1065	28.28690*	298368.3*	23.95036*	24.8301	24.25741
2	-398.5379	18.85292	374291.7	24.141	25.72452	24.69369

Source: Author's Compilation using Eviews 10 (2021)

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

4.4 Co-integration Test-Bound

As the optimal lag length by which the estimation of variables according to various objectives have been determined, the existence or non-existence of long run relationship amongst dependent and independent variables is being determined. The determination of long run relationship is based off the values of the computed F-statistic, lower bound I(0), and higher bound I(1) values. The decision criteria is as thus; if the computed F-statistic is lower than the lower bound I(0) the null is not rejected, that is, there is no long run relationship, but if the computed F-statistic is greater than the upper bound value I(1) it shows that the existence of a long run relationship among the variables holds. However, if the computed F-statistics lies between the lower bound and upper bound the long run association between the variables is deemed indeterminable, that is, inconclusive. The result of the bound test is shown in table 4.4. As can be seen from the table 4.4, at 5 percent level of significance the study rejects the null hypothesis of no long run relationship among the examined variables that is in objective one the F- statistics (11.6329) is greater than the upper bound value (3.67) at 5% level of significance, in objectives two the F-statistics (4.643596) is greater than the upper bound value (3.67), a similar result was computed for objective three the F- statistics (6.584918) is greater than the upper bound value (3.67). Therefore, across objectives 1, 2 and 3, there is the existence of long run relationship

Table 4.4: Result of Bound Test to Cointegration

Results of Bound Test Approach to Co-Integration for Objective One			
Significance	Critical value Bonds		Computed F-statistics
	Lower Bound I(0	Higher Bound I(1)	
10%	2.37	3.2	
5%	2.79	3.67	**11.6329**
2.50%	3.15	4.08	
1%	3.65	4.66	
Results of Bound Test Approach to Co-Integration for Objective Two			
Significance	Critical value Bonds		Computed F-statistics
	Lower Bound I(0	Higher Bound I(1)	
10%	2.37	3.2	
5%	2.79	3.67	**4.643596**
2.50%	3.15	4.08	
1%	3.65	4.66	
Results of Bound Test Approach to Co-Integration for Objective Three			
Significance	Critical value Bonds		Computed F-statistics
	Lower Bound I(0	Higher Bound I(1)	
10%	2.37	3.2	
5%	2.79	3.67	**6.584918**
2.50%	3.15	4.08	
1%	3.65	4.66	

Source: Author's Compilation using Eviews 10 (2021)

4.5 Results on ARDL Model Test: Short Run and Long Run Effects

4.5.1 Empirical Results on the Long Run Effects

The result of the long run effects of objective 1 is presented in table 4.5 below, an examination of the result in table 4.5 shows the individual relevance of each explanatory variables and its impact on manufacturing value added (MVApg) as an indicator for the growth of the manufacturing sector. The long run equilibrium relationship between the manufacturing price deflator (MPDpg) and growth in the manufacturing sector is negative as indicated by its coefficient (-0.506031), and the relationship between them statistically significant as shown by the prob. value (0.0019). This conforms to a-priori expectation as a 1% increase in the growth rate of the manufacturing price deflator would indicate a 50.6% decrease in the growth level of the manufacturing sector, ceteris paribus. On further analysis, the coefficient of the real interest rate is negative (-0.463023) which conforms to a-priori expectation, but not statistically significant with prob. value (0.1451>0.05) and t-statistics (-1.494692<1.5). Specifically, in the long run holding other things constant a 1% change in real interest rate (RINT) will reduce manufacturing growth level by 46.3%. This indicates the need to control the rate at which real interest rate increases as it restricts borrowing, which is a major source of funds for manufacturing activities, being that this sector is characterised by heavy-duties and high costs. More so, Exchange Rate (EXR) has a positive and significant effect on growth as regards the manufacturing sector, as shown by the coefficient (0.019 with the prob. value (0.0139) which is greater than 0.05 and t-statistic (2.608913). Hence, a unit increase in exchange rate will bring about a 1.9% increase in manufacturing growth. This conclusion is in agreement with the works of Lawal (2016) but contrasts the findings of Ojeyinka and Adegboye (2017) indicating a negative relationship between EXR and manufacturing growth. However, this conclusion does not conform to a-priori expectation as an increase in exchange rates will lead to the valuation of domestic

currency in relation to that of foreign countries, hence, making imports cheaper and exports more expensive, thus, decreasing manufacturing output. However, this result could be due to certain circumstances.

Also, the R-squared, the adjusted R-squared, the F-statistic and the Durbin-Watson statistic for the selected model is shown in panel B of the table 4.5. As observed from the result presented in table 4.5 the explanatory power (R-squared) of the model is low (0.494155). In essence, the proportion of variation in manufacturing sector measured by percentage growth rate in manufacturing value added (MVApg) that is jointly explained by manufacturing price deflator, real interest rate and exchange rate is about 49%. Moreover, the Adjusted R-Squared that is the proportion of variation in economic growth measured by MVApg that is jointly explained by the explanatory variables after the effect of insignificant repressor has been removed is about 41%. Furthermore, the F-statistic which is used to measure the overall significance of the estimated model is significant at 6.056719 with probability value ($p = 0.0005$). This indeed is a re-enforcement of the goodness of fit. These suggest manufacturing price deflator percentage growth rate (MPDpg), Real Interest Rate (RINT), Exchange Rate (EXR) are insignificant determinants of manufacturing growth in Nigeria. This further reinforces the fact that the results reported are of policy insignificance. Besides, the Durbin Watson statistic which is used to test for autocorrelation of residuals in the model, in particular, indicates the presence of negative auto correlation at 2.12984>2.

The result of the long run effects of objective 2 is presented in table 4.6 below, an examination of the result in table 4.6 shows the individual relevance of each explanatory variables and its impact on manufacturing value added (MVApg) as an indicator for the growth of the manufacturing sector. The long run equilibrium relationship between the monetary policy rate (INT) and growth in the manufacturing sector is negative as indicated by its coefficient (-0.061297), and the relationship between them statistically insignificant

as shown by the prob. value (0.951>0.005) and t-statistic value (-0.061917<1.5). This indicates that a 1% increase in the monetary policy rate (INT) would indicate a 6.1% decrease in the growth level of the manufacturing sector, ceteris paribus. On further analysis, the coefficient of the percentage growth rate in money supply (M2pg; broad money) is positive (0.045686) which does not conform to a-priori expectation. However, this is not statistically significant as shown by prob. value (0.7248>0.05) and t-statistics (0.355202<1.5). Specifically, in the long run holding other things constant a 1% change in percentage growth rate in money supply (M2pg; broad money) will increase manufacturing growth level by 4.57%. Also, Consumer Price Index (CPI) has a positive and significant effect on growth as regards the manufacturing sector, as shown by the coefficient (0.173422) with the prob. value (0.0982) which is greater than 0.05 and t-statistic (1.704977). Hence, a unit increase in Consumer Price Index will bring about a 17.3% increase in manufacturing growth. However, this does not conform to a-priori expectation as an increase in the value of CPI indicates an increase in the level of inflation, hence, showing a costlier standard of living which reduces demand for goods at large and in the manufacturing sector, hence, reducing output. However, this result could be due to certain circumstances. Perhaps, if the purchase of these goods is skewed into the hands of the rich.

Also, the R-squared, the adjusted R-squared, the F-statistic and the Durbin-Watson statistic for the selected model is shown in panel B of the table 4.5. As observed from the result presented in table 4.5 the explanatory power (R-squared) of the model is extremely low (0.167764). In essence, the proportion of variation in manufacturing sector measured the Consumer Price Index (CPI), broad money supply (M2pg) and Monetary Policy Rate (INT) is roughly 17%. The Adjusted R-Squared reinforces the weakness of this model by means of its coefficient value at 0.033533. Furthermore, the F-statistic which is used to measure the overall significance of the estimated model is significant at 1.249814 with

probability value (p = 0.3102). Also, the Durbin Watson statistic which is used to test for autocorrelation of residuals in the model, in particular, indicates the presence of positive auto correlation at 1.870318<2.

In evaluating the long run estimates for objective three in table 4.6, the impact of all variables IPDpg (Implicit Price Deflator percentage growth), FDI (Foreign Direct Investment) and PLR (Prime Lending Rate) remain largely insignificant by virtue of their t-statistic (t<1.5) and probability values (p>0.05). These variables all defy a-priori expectations except for the Implicit Price Deflator (IPDpg), whose coefficient value at -0.30722 indicates that all other things being equal, a 1% increase in the implicit price deflator would lead to a 30.7% decrease in manufacturing value added. Foreign Direct Investment was seen to have a negative relationship with manufacturing value added, as a 1% increase in FDI would lead to a 31% decrease in manufacturing value added. This can be accorded to a number of reasons, some of which are foreign exploitation, capital flight, etc. The prime lending rate is estimated to have a positive relationship with MVApg, in which a 1% increase in PLR would lead to a 12.5% increase in manufacturing growth as stood in by manufacturing value added.

Likewise, as seen in objective 2, the goodness of fit of the long run model specification for objective three is extremely low at a value of 0.282584, indicating that the proportion of variation in manufacturing sector measured by the Implicit Price Deflator (IPDpg), Prime Lending Rate (PLR) and Foreign Direct Investment (FDI) is roughly 28%. The Adjusted R-Squared reinforces the weakness of this model by means of its coefficient value at 0.192908. Furthermore, the F-statistic which is used to measure the overall significance of the estimated model is significant at 3.151139 with probability value (p = 0.0272). Also, the Durbin Watson statistic stands at 1.879264<2 indicating the presence of positive autocorrelation.

Table 4.5: Estimated Long Run Dynamics for Objective One

LONG RUN FOR OBJECTIVE ONE				
Panel A: Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
MPDPG	-0.506031	0.148769	-3.401458	0.0019
RINT	-0.463023	0.309778	-1.494692	0.1451
EXR	0.019216	0.022756	0.844447	0.4049
C	11.78922	4.518827	2.608913	0.0139
Panel B: Goodness-of-fit Measures				
R^2			0.494155	
Adjusted R^2			0.412567	
F-statistic			6.056719	
Prob(F-statistic)			0.0005	
Durbin-Watson stat			2.12984	
EC = MVAPG - (-0.5060*MPDPG -0.4630*RINT + 0.0192*EXR + 11.789				

Source: Author's Compilation from Eviews 10 (2021)

Table 4.6: Estimated Long Run Dynamics for Objective Two

LONG RUN FOR OBJECTIVE TWO				
Panel A: Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CPI	0.173422	0.101715	1.704977	0.0982
M2PG	0.045686	0.12862	0.355202	0.7248
INT	-0.061297	0.625212	-0.098042	0.9225
C	-0.55657	8.988919	-0.061917	0.951
Panel B: Goodness-of-fit Measures				
R^2			0.167764	
Adjusted R^2			0.033533	
F-statistic			1.249814	
Prob(F-statistic)			0.3102	
Durbin-Watson stat			1.870318	
EC = MVAPG - (0.1734*CPI + 0.0457*M2PG -0.0613*INT -0.5566)				

Source: Author's Compilation from Eviews 10 (2021)

Table 4.7: Estimated Long Run Dynamics for Objective Three

LONG RUN FOR OBJECTIVE THREE				
Panel A: Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
IPDPG	-0.30722	0.15929	-1.928682	0.0627
FDI	-3.117064	2.092483	-1.489648	0.1461
PLR	1.254454	0.587463	2.135374	0.0405
C	-10.97432	9.330077	-1.17623	0.2482
Panel B: Goodness-of-fit Measures				
R^2			0.282584	
Adjusted R^2			0.192908	
F-statistic			3.151139	
Prob(F-statistic)			0.0272	
Durbin-Watson stat			1.879264	
EC = MVAPG - (-0.3072*IPDPG -3.1171*FDI + 1.2545*PLR -10.9743)				

Source: Author's Compilation from Eviews 10 (2021)

4.5.2 Empirical Results on the Short Run Effects

In order to determine the short run effects of the variables used in the ARDL model in respect to objective 1. The ECM model is used to assess the short run adjustment mechanism to equilibrium as well as the speed of adjustment. The short-run dynamics of the equilibrium relationship were obtained directly as the estimated coefficients of the leveled and first-differenced variables in the ARDL model and the results are presented in table 4.8. As can be seen from the results presented in table 4.8, it is evident that the coefficient of the error correction term (-1.056519) for the estimated equation is both statistically significant and negative with prob. value = 0.0001<0.05 and t-statistic = -4.525252. In essence, the speed of adjustment implied by the coefficient of C suggests that the deviation from short run to long run is corrected by 1.0565 units per each year. Therefore, there is a stable long run relationship among Manufacturing Value Added percentage growth rate, Manufacturing Price Deflator percentage growth, Real Interest Rate and Exchange Rate. Additionally, the estimated short-run model revealed that it is similar to its insignificant long run. Precisely, a unit increase in the Manufacturing Price Deflator percentage growth (MPDpg) in previous years will cause Manufacturing Value Added percentage growth rate (MVApg) to decrease by 0.0824, ceteris paribus as seen in table 4.8. Similarly, Real Interest Rate (RINT) is insignificant and has a negative impact on growth, by its previous year value, in the manufacturing sector by proxy of MVApg at 0.6% percent. Precisely a one present increase in gross domestic savings will cause real GDP to increase by 0.934228 percent, ceteris paribus. Also, Exchange rate in previous years is seen to have a negative and insignificant effect on manufacturing sector by value of -0.185439. precisely, a 1% increase in EXR(-1) will lead to a 1.8% increase in manufacturing sector performance in the short run.

However, in comparison to the long run ARDL model in relation to objective one, the short run ARDL model is a fairly good fit as indicated by the R-Squared value (0.55) which is past the average 50% level. Hence, the level of variation explained in the manufacturing

sector by proxy of Manufacturing Value Added (MVApg) and independent variables; MPDpg (Manufacturing Price Deflator percentage growth rate), RINT (Real Interest Rate), EXR (Exchange Rate) is about 55% in the short run. However, by order of the adjusted R-Squared (0.476) this model is not a good fit. Furthermore, the F-statistic which is used to measure the overall significance of the estimated model is significant at 7.361775 with probability value (p = 0.000132). Also, the Durbin Watson statistic stands at 2.00145 which is a very close approximation to 2 indicates the absence of autocorrelation in this short run model.

In analysing the short run effects of the variables used in the ARDL model in respect to objective 2, as can be seen from the results presented in table 4.9, it is evident that the coefficient of the error correction term (-0.911005) for the estimated equation is both statistically significant and negative with prob. value = 0.0001<0.05 and t-statistic = (-4.694367). In essence, the speed of adjustment implied by the coefficient of C suggests that the deviation from short run to long run is corrected at a speed of 91% each year. Therefore, there is a stable long run relationship among Manufacturing Value Added percentage growth rate, CPI (Consumer Price Index), M2pg (supply of broad money) and INT (Monetary Policy Rate). Additionally, the estimated short-run model revealed that it is similar to its insignificant long run. Precisely, a unit increase in the CPI (Consumer Price Index) in previous years will cause Manufacturing Value Added percentage growth rate (MVApg) to decrease by 1.05%, ceteris paribus as seen in table 4.8. Similarly, M2pg (supply of broad money) is insignificant and has a negative impact on growth, by its previous year value, in the manufacturing sector by proxy of MVApg at 0.1087% percent. Precisely a one percent increase in M2pg (supply of broad money) in previous years will cause MVApg to decrease by 1.08 percent, ceteris paribus. Also, Monetary Policy rate (INT) in previous years is seen

to have a positive and insignificant effect on manufacturing sector by value of its coefficient (0.867563), t-statistic (1.825973) and p-value (0.0778).

Likewise, in comparison to its long run model goodness of fit, the short run ARDL model in respect to objective 2 is fairly a good fit as inferred from the R-squared value of 0.52305 which shows a 52% level of explanation in the variation of MVApg in the short run. This inference is however contrasted by the R-squared value at 0.443558 showing a 44% level of explanation after removing the effect of the irrelevant repressor. Furthermore, the F-statistic which is used to measure the overall significance of the estimated model is significant at 6.579937 with probability value (p = 0.000305). Also, the Durbin Watson statistic stands at 1.989089 which is below the value of 2 indicating the presence of positive autocorrelation in this short run model.

In analysing the short run effects of the variables used in the ARDL model in respect to objective 3, as can be seen from the results presented in table 4.10, it is evident that the coefficient of the error correction term (-0.937329) for the estimated equation is both statistically significant and negative with prob. value = 0.0001<0.05 and t-statistic = (-4.388469). In essence, the speed of adjustment implied by the coefficient of C suggests that the deviation from short run to long run is corrected at a speed of 94% each year. Therefore, there is a stable long run relationship among Manufacturing Value Added percentage growth rate, FDI (Foreign Direct Investment), PLR (Prime Lending Rate) and IPDpg (Implicit Price Deflator percentage rate). Additionally, the estimated short-run model revealed that it is similar to its insignificant long run. Precisely, a unit increase in the PLR (Prime Lending Rate) in previous years will cause Manufacturing Value Added percentage growth rate (MVApg) to decrease by 1.22%, ceteris paribus as seen in table 4.10. Similarly, FDI (Foreign Direct Investment) is insignificant and has a negative impact on growth, by its previous year value, in the manufacturing sector by proxy of MVApg at -1.04 percent.

Precisely a one percent increase in FDI (Foreign Direct Investment) in previous years will cause MVApg to decrease by 10.4 percent, ceteris paribus. Also, IPDpg (Implicit Price Deflator percentage rate) in previous years is seen to have a positive and insignificant effect on manufacturing sector by value of its coefficient (0.047194), t-statistic (0.346159) and p-value (0.7316).

Likewise, in comparison to its long run model goodness of fit, the short run ARDL model in respect to objective 3 is fairly a good fit as inferred from the R-squared value of 0.50704 which shows a 51% level of explanation in the variation of MVApg in the short run by concerned variables in objective 3. This inference is however contrasted by the R-squared value at 0.424879 showing a 42% level of explanation after removing the effect of the irrelevant repressor. Furthermore, the F-statistic which is used to measure the overall significance of the estimated model is significant at 6.171362 with probability value (p = 0.00048). Also, the Durbin Watson statistic stands at 2.158683 which is above the value of 2 indicating the presence of negative autocorrelation in this short run model.

Table 4.8: Estimated Short Run Dynamics for Objective One

SHORT RUN FOR OBJECTIVE ONE				
Panel A: Short Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.647887	1.920412	2.420256	0.0218
D(MVAPG(-1))	-0.080232	0.195501	-0.410391	0.6844
D(MPDPG(-1))	-0.082409	0.105381	-0.782004	0.4403
D(RINT(-1))	-0.066462	0.167562	-0.396643	0.6944
D(EXR(-1))	-0.185439	0.096459	-1.922453	0.0641
ECT(-1)	-1.056519	0.233472	-4.525252	0.0001
Panel B: Goodness-of-fit Measures				
R^2			0.550958	
Adjusted R^2			0.476118	
F-statistic			7.361775	
Prob(F-statistic)			0.000132	
Durbin-Watson stat			2.00145	
Source: Author's Compilation from Eviews 10 (2021)				

Table 4.9: Estimated Short Run Dynamics for Objective Two

SHORT RUN FOR OBJECTIVE TWO				
Panel A: Short Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.630463	2.224075	0.733097	0.4692
D(MVAPG(-1))	0.130156	0.15882	0.819521	0.419
D(CPI(-1))	-0.105196	0.223817	-0.470007	0.6417
D(M2PG(-1))	-0.10871	0.092882	-1.170417	0.251
D(INT(-1))	0.867563	0.475124	1.825973	0.0778
ECT(-1)	-0.911005	0.194063	-4.694367	0.0001
Panel B: Goodness-of-fit Measures				
R^2			0.52305	
Adjusted R^2			0.443558	
F-statistic			6.579937	
Prob(F-statistic)			0.000305	
Durbin-Watson stat			1.989089	
Source: Author's Compilation from Eviews 10 (2021)				

Table 4.10: Estimated Short Run Dynamics for Objective Three

SHORT RUN FOR OBJECTIVE THREE				
Panel A: Short Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.678293	1.680842	0.403544	0.6894
D(MVAPG(-1))	-0.004421	0.1751	-0.025251	0.98
D(IPDPG(-1))	0.047194	0.136337	0.346159	0.7316
D(FDI(-1))	-1.040803	1.379856	-0.754284	0.4566
D(PLR(-1))	-0.122147	0.460015	-0.265528	0.7924
ECT(-1)	-0.937329	0.213589	-4.388469	0.0001
Panel B: Goodness-of-fit Measures				
R^2			0.50704	
Adjusted R^2			0.424879	
F-statistic			6.171362	
Prob(F-statistic)			0.00048	
Durbin-Watson stat			2.158683	
Source: Author's Compilation from Eviews 10 (2021)				

4.6 Summary of Discussion of Results

This chapter of the research addressed assessment outcomes in line with the study's research objectives which are; investigating the impact of manufacturing implicit price deflator on the Nigerian manufacturing sector, analyzing the impact of consumer price index on the manufacturing sector in Nigeria and assessing whether a positive or negative relationship exists between the GDP deflator and manufacturing output in Nigeria. This has been accomplished through econometric analytical methods. The following findings were made in this research; the manufacturing price deflator has a negative and insignificant effect on the Nigerian manufacturing sector in the short run, however, it is significant in the long run; Consumer Price Index has a negative and insignificant effect on the Nigerian manufacturing sector in the short run, however it has a positive relationship in the long run; the GDP deflator is found to have a nonsignificant effect on the Nigerian manufacturing sector in both the short run and long, however, its effect is positive in the short run and negative in the long run.

Consequently, we accept null hypothesis across all objectives. That is, Manufacturing Implicit Price Deflator has no significant effect on manufacturing sector output in Nigeria, Consumer Price Index (CPI) has no significant effect on manufacturing sector in Nigeria and GDP deflator (IPD) has no significant effect on manufacturing sector output in Nigeria.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATION

5.1 Introduction

This chapter presents the summary of the findings. It outlines the policy conclusions and recommendations premised on the results of the study. The main contributions to the knowledge as well as the limitations of the study.

5.2 Summary of the findings

The primary objective of this project job was to examine the connection between Nigeria's manufacturing sector, Manufacturing Price Deflator, Consumer Price Index and Implicit Price Deflator for 1981 to 2019. The impact the variables on Nigeria's manufacturing sector has been produced precisely. The necessary background to the research was laid to accomplish these goals, the issues were recognized and justified accordingly. The research used econometric analytical methods. Using the Auto Regressive Distributed Lag Model (ARDL), specific goals 1, 2 and 3 were achieved. The unit root test was estimated to determine the order of integration of variables included in the study so as to conform to the ARDL model. This was carried out using both the Augmented Dickey-Fuller (ADF) and the Phillip and Perron (PP) test before the ARDL test was conducted. The outcomes of the ADF and PP revealed all the variables were either stationary in level form I(0) or at first difference I(1). After the variables had been determined to be stationary at level or first difference. The ARDL models ' lag order was predicted using VAR lag order selection criteria that picked lag 1 for the three ARDL models, in respect to objectives 1, 2 and 3. The cointegration relationship between the variables was determined in each ARDL model using the bound tests, which concluded the presence of a long run relationship

amongst concerned variables. The research then proceeded to assess the long-term and short-term connection between factors using ARDL. The investigation shows no significance for the effect of Manufacturing Price Deflator (MPDpg), Consumer Price Index (CPI) and IPDpg (Implicit Price Deflator) on manufacturing sector.

5.3 Conclusion

This research aims to address the three primary problems of domestic price levels and the manufacturing sector. The empirical findings presented in the research suggest the presence of a long-term inflation-manufacturing partnership that exerts an adverse impact on manufacturing output, however, its impact is trivial in comparison to domestic price level impacts in the short run via CPI, MPDpg, IPDpg. Based on the ECT coefficient across objectives 1, 2 and 3, the manufacturing price deflator and implicit price deflator are seen to have a faster adjustment process into long run equilibrium, in comparison to CPI. Findings further indicate that Monetary Policy Rate, foreign direct investment and Real Interest Rate have a adverse and insignificant economic connection to manufacturing sector's output.

5.4 Recommendations

These findings have significant policy consequences. The Implicit Price Deflator was seen to be non-significant in both the long run and the short run. This could be due to the fact that the GDP Implicit Price Deflator covers the entire economy of which manufacturing is not really emphasized in a developing country like Nigeria. Hence, in policy implementations, more focus should be giving to factors that directly influence the manufacturing sector to allow effective target development. The supply of broad money

(M2pg) was seen to have a positive effect in the long run, although it has a negative effect in the short run. Hence, in other to maximize this and make a significant impact of this variable on the growth of the manufacturing sector in the long run, contractionary fiscal policies should be implemented in the short run by the government so as to offset inflationary pressures in the short run. This could be in form of increase in tax rates, decrease in government spending etc. This is needed because an increase in M2 will lead to a lot of money chasing fewer goods which would lead to an increase in price level, hence, influencing the cost of production and eventually decreasing manufacturing output.

This research only used Manufacturing Price Deflator, Consumer Price Index, Implicit Price Deflator, Foreign Direct Investment, Prime Lending Rate, Broad money supply, Monetary Policy Rate, Real Interest Rate, Exchange Rate etc as variables influencing Nigeria's manufacturing sector that turned out to be irrelevant in both the short and long term after inquiry. Further study may therefore add additional variables to determine its connection and meaning.

5.5 Study Limitations

A major limitation in the conduct on this study was the limited availability of relevant data, dearth of relevant data, and lack of accuracy across various relevant data platforms. Also, this research is not conclusive as it does not include all relevant inflationary indicators on the domestic price level as well as the manufacturing sector. Another restraint was in reference to the time constraint induced on the completion of this project.

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