IMPORT PENETRATION AND MANUFACTURING SECTOR IN NIGERIA

BY

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UNDERTAKING

This project work was carried out by LISA OSATO IGBINOBA I have not copied the work of any author. All works used have been duly cited and acknowledged.

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LISA OSATO IGBINOBA **DATE**

CERTIFICATION

This is to certify that this project was carried out by LISA OSATO IGBINOBA in the department of Economics and Statistics, University of Benin, Benin City

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Date

DEDICATION

I dedicate this project work to God Almighty.

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All thanks goes to God almighty for the Gift of life and Grace in this academic race.

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ABSTRACT

The study sought to evaluate the recruitment policy and manpower utilization in the civil service; using Edo state as a case study. Seven research questions were raised for the study; what considerations guide the processes of recruitment in Edo state civil service? Are respondents satisfied with the transfer policies of the Edo state civil service? Are respondents satisfied with the appraisal policies of the Edo state civil service? Are selection and placement processes in Edo state civil servi2efv ce acceptable? Are selection and placement in the civil service of Edo state done on merit? To what extent are the staff members utilized in the civil service of Edo state? Are sanctions effective in checking selection irregularities the Edo state civil service? The research method for designs to be used is case study and survey method. This is where various ministries and departments of the state civil service are consulted. Information gathered from the different departments and ministries would be used for this project. A sample of two hundred (200) respondents was used for the study. Data collected from the questionnaire was analyzed using descriptive statistics. Frequency distribution and percentage analysis is used to analyze the research question while T-test and ANOVA was used to test the hypotheses raised. Findings show that 53% of respondents agree that the processes of selections is fair and 52.5% strongly agree and 43.0% agree that the employment equity is considered,31.0% however disagree. In distribution of manpower 101 respondents which is 50.5% disagree that government of origin is adequately represented in the Edo State civil service. 25.0% strongly disagree that they are satisfied with the promotion system 34.0% disagree but 25.5% agree and 15.5% strongly agree. Respondents largely agree that the selection process is fair acceptable as 53.0% agree and 38.0% strongly agree. 121 respondents agree (60.5%) and 24.0% strongly agree that the manpower force in the civil service is adequate. Responses show that sanctions are present but are not always applied. 50.5% held that cases of suspected irregularities are seldom reported to management. However 35.0% held that management takes disciplinary action often 41.0% responded that it is sometimes that management takes disciplinary action 24.0% held that the disciplinary action is seldom taken. The study recommends a review of the recruitment policy must be made expedient for the smooth implementation of the policy and the civil service commission should embark on a comprehensive audit and appraisal of workers to identify the gaps in manpower utilization in Edo state civil service

CHAPTER ONE

INTRODUCTION

1.4 PREAMBLE

No country is self sufficient in terms of goods and services needed to meet her daily needs of raw materials, intermediate goods and finished goods. Hence, the involvement of countries in international trade as espoused by trade theorist such as Ricardo's theory of international trade is inevitable. Ngwudiobu, Aidi and Fadeyi (2018) noted that for a country like Nigeria to grow economically, conventional economic wisdom suggests that developing country find solace in importing capitals goods from developed countries so as to stimulate local firms. Hence, importation becomes imperative for a developing country like Nigeria to develop. However, this becomes an evil when a country depends on it too much, thus, having a negative effect on local industries. This is because, by importing finished products from abroad, they tends to compete with locally made goods and this may lead to the closing of many local firms.

Nigeria on the average depends on importation of raw materials for her manufacturing sector to thrive. Before now, agriculture was the mainstay of the Nigerian economy, in that it provided raw materials for the manufacturing industry. The contribution of the agricultural sector to Gross Domestic Product (GDP) surpassed every other sector in the economy, for example, in 1964-1965, agriculture accounted for 55% of GDP and employed 70% of the adult work force (Malton, 1981).

However, the discovery of oil in commercial quantities in 1957 paved way for the gradual neglect of agriculture. This led Nigeria's to neglect its strong agriculture which was the mainstay of the economy and manufacturing sector in favor of an unhealthy dependence on oil for more than 97% of export earnings and 80% federal revenue (United States Department of States, 2005).

The neglect of agriculture as a result of the influx of oil, declined agricultural productivity. This is not because Nigeria has no arable land, but rather due to the fact that her attention has been diverted to oil exploration. It was therefore not surprising that by 1975, the economy had become a net importer of basic food items and this affected local industries, which led to the general economic terminology of "Dutch disease syndrome". Dutch disease syndrome is the exploitation of a natural resources and decline in the other sectors. It is

an effect felt by the manufacturing sector of a nation as a result of her newly discovered natural resources (oil).

Given this backdrop, there is no point gainsaying that Nigeria manufacturers might be incapacitated to meet up with the demands of the Nigerian population (since her population is over 200 million people). This makes the concept import penetration and manufacturing sector in Nigeria a worthy inquiry.

1.5 STATEMENT OF THE PROBLEM

The Nigerian economy is highly dependent on imports for production and consumption. A greater share of raw materials for production purposes are imported, leaving the country to depend heavily on foreign supply for intermediate goods and capital goods. It is crucial to note that the manufacturing sector output is relatively low and with the country's high level of consumption due to its population, there will be very little for exports. This situation has been attributed to the Dutch disease syndrome and if oil prices should fall, then the economy is likely to face a proportionate effect on foreign exchange earnings which may affect exchange rate and also affect output negatively and spur inflation (Mordi, 2006).

Nigeria has implemented SAP for 35years now, but none of the objectives has been achieved and there is no indication that any of the objectives can be

achieved using the chosen program instruments such as exchange rate devaluation. Nigerian economists and financial institution points out that the Nigerian economy had become indebted and unable to repay because it had been involved in indiscriminate importation and had also neglected the non-oil exports as potential exchange earners. The economists believe that the solution to the problem lay in a mechanistic manipulation of the import-export equation, which dictates that a country's exports (or earn) must be greater than it imports (spends) to generate a positive balance of trade (Ogbimi, 2001).

1.6 RESEARCH QUESTIONS

The research questions for this study are:

1. What is the impact of import penetration on the manufacturing sector in Nigeria?
2. What is the impact of imports on manufacturing sector in Nigeria?

1.4 OBJECTIVES OF THE STUDY

The broad objective of this study is to examine the impact of import penetration on manufacturing sector in Nigeria. However, the specific objectives are:

1. To determine the impact of import penetration on manufacturing sector in Nigeria.
2. To investigate the impact of imports on manufacturing sector in Nigeria.

1.5 RESEARCH HYPOTHESES

The research hypotheses for this study are:

H_{01}: Import penetration has no significant impact on manufacturing sector in Nigeria.

H_{02}: Imports have no significant impact on manufacturing sector in Nigeria.

1.6 SIGNIFICANCE OF THE STUDY

Given the situation of our economy and the rapid increase in our nation's population, there is no need to gainsay that the economy's demand for consumables will increase drastically. However, given our observed trend in manufacturing output, it is important to note that nearly two decades have been with a downward trend.

Most studies have focused on other things (variables) as the cause for this poor performance and only a scanty number of studies have focused on some gray areas. Therefore, this study will be of interest to other researches after this

study, on how import penetration has affected the manufacturing sector performance in Nigeria.

In addition, the findings of this research should bring about better policies that will revamp the activities of the manufacturing sector in Nigerian.

1.7 SCOPE OF THE STUDY

This is a country specific study with the aim of determining the impact of import penetration on manufacturing sector in Nigeria. Five (5) macroeconomic variables were selected for this study which are; imports, import penetration, output growth, interest rate and Manufacturing sector. In addition, some control variables such as trade openness, and inflation will be employed. Times series annual data ranging from 1981 to 2019 will be used for the study. The choice of the data period is based on data availability.

The justification for selecting the variables above is that they are the central issues of concern for this study.

CHAPTER TWO

BACKGROUND TO THE STUDY

2.1 THE NIGERIAN MANUFACTURING SECTOR

The Nigerian manufacturing sector consist a wide range of industrial activities from informal sector enterprises with simple technology application to heavy capital goods industries within the automotive and electrical equipment sector. According to the National Bureau of Statistics (NBS, 2007), the Nigerian manufacturing sector is comprised of thirteen (13) activities, which are; oil refining; cement; food, beverages and tobacco; non-metallic products; textile, apparel and footwear; wood and wood products; pulp paper and paper products; plastic and rubber products; chemical and pharmaceutical products; electrical and electronic, basic metal and iron and steel; motor vehicles and assembling; and other manufacturing.

The structure of manufacturing production has been a by-product of the various development plans (Chete & Adenikinju, 2002). The first national development plan (1962-1968) emphasised the establishment of light industries and assembly plants. The outcome was the production of machine tools, kitchen utensils, electric fans and vehicle assembly. The second development plan (1968-1975) had a similar thrust with revenue generation as

its objective through the promotion of exports industries as its central focus. The third national development plan (1975-1980) emphasised the establishment of heavy industries with projects in the steel and petroleum refining sub-sectors becoming dominant. The fourth national development plan (1980-1985) was in line with the third, but was later jettisoned (for example, the iron and steel sub-sector) due to the profound economic crises of the 1980s.

The general belief is that, in manufacturing lies the main instrument of rapid growth, self sufficiency and structural changes (Anyanwu, 1993). However, the Nigerian manufacturing sector has been given the major role of driving the needed growth and development of the economy. Also, the sector has been given the major task of transforming the economy away from overdependence on crude oil, and an import dependent economy to a diversified export oriented economy (Federal Government of Nigeria, 2001).

The manufacturing sector provides the base in which the dependence on oil can be reduced in the economy, through its potential to advance activities in the secondary and tertiary sectors. Also, a developed manufacturing sector ensures the enhancement of the economy's productive capabilities to provide an increasing range of manufactured goods in order to reduce the reliance on

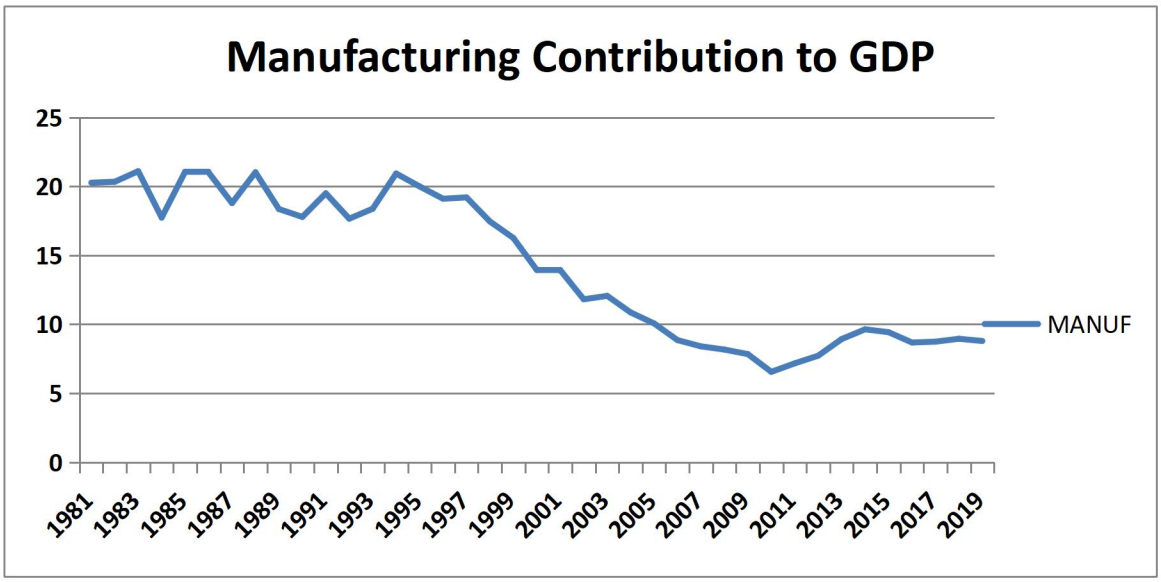
imports and providing for diversified exports. However, this can only be achieved with increase in productivity and competitiveness of domestic firms as well as improved exports of manufactured goods.

2.1.1 The Nigerian Manufacturing Sector's Contribution to GDP

The manufacturing sector is a very important sector because of its capacity to foster wide and efficient backward and forward linkages among other sectors of the economy. Kayode (2000) described the manufacturing sector as the engine room for any economy. The contribution of the manufacturing sector to Gross Domestic Product (GDP) indicates the value-added in the economy at any given time. Thus, increase in GDP is driven by an increase in the sector's productivity levels.

The chart shows the manufacturing sector contribution to Gross Domestic Demand (GDP)

Figure 2.1



Source: World Bank Development Indicators (2019)

The chart above shows an annual trend of the manufacturing sectors contribution to GDP. This observed a steady fluctuation from 1981 to 1997. However, from 1997, there has been a downward trend to 2019. This shows a poor performance of the manufacturing sector in Nigeria. The manufacturing sector in Nigeria cannot support economic development in its present condition. It has great potential since Nigeria is one of the most attention-grabbing markets of the region by having about 180million consumers and millions more consumers in the neighboring countries. The importance of manufacturing sector is also realized from the fact that private consumption

expenditures are significantly increasing in the country at about 15 to 20% per year. However, many problems are hindering the growth of the manufacturing sector in Nigeria which includes power –supply most firms rely on power generators to run seamless operations. The country's physical infrastructural facilities which are also a major constraint, difficult access to credit, and skilled labour and the country's heavy dependence on imported goods. As a result of these problems, the country is progressively very slow towards economic diversification (Mustapha & Goh, 2010).

To further buttress the trend above in figure 2.1, a touch with data reveals the average contribution of manufacturing sector to GDP is explained as follows: The total manufacturing output rose from an average of 20.24% during 1981-1986. The aftermath of the Structural Adjustment Programme (SAP) for the year 1987-1992 observed a drop in the contribution of the manufacturing sector to GDP to a tune of 18.84% which later rose again to 19.17% in 1993-1998. During the period of 1999-2003, the manufacturing output declined to 13.59% and this downward trend continued in 2004 -2008 and 2009- 2013 were the manufacturing output was 9.26% and 7.64% respectively. This later rose to 9.03% in 2014-2019, this shows a downward trend to 2019. This however, suggests that the country is incapable to meet up with her local demand, thus making importation a second best option.

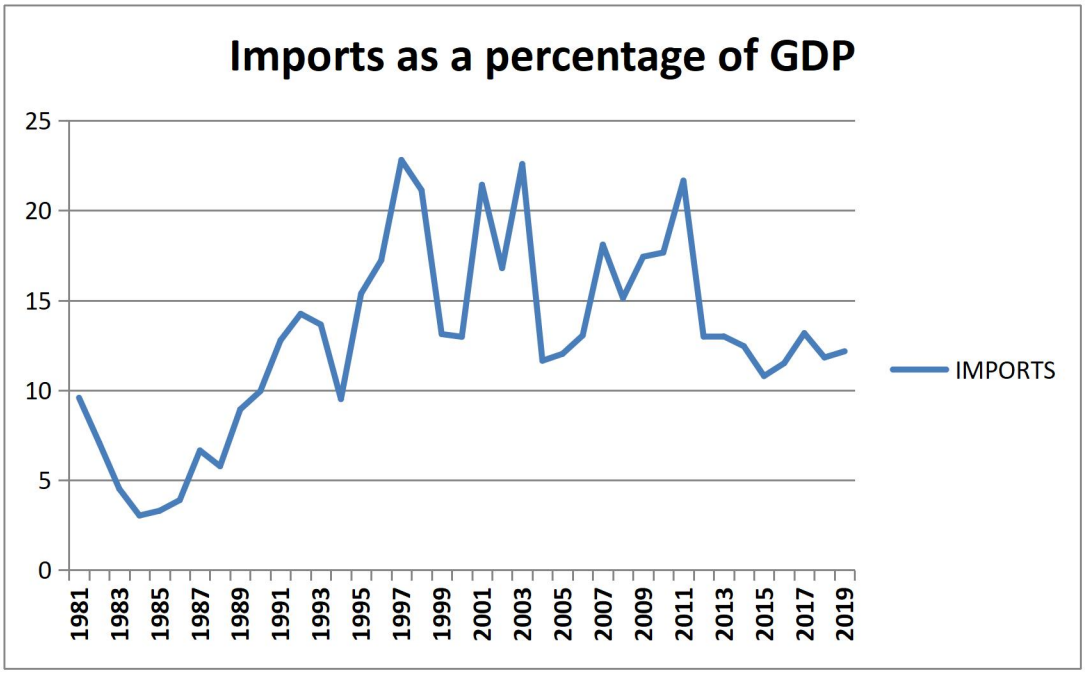
2.2 IMPORT IN NIGERIA

Import is vital to the growth and development of an economy, as it affects production, which in turn constitutes the source of expansion in any economy. Import is crucial for external trade and the import of productive commodities specially. It is important for domestic investment and economic progress. The motivation for a country to import goods and services varies from one country to another. The motivation includes: to provide goods and services needed for the well being of the citizens; to bridge the production gap for goods that can be produced locally but not in large quantity; and raw materials for industrial usage. Most importantly, in line with comparative advantage, some countries import goods that cannot be produced efficiently, while others are for development purposes (Englama, Oputa, Sanni, Yakub, Adesanya & Sani, 2013). Nigeria is not left among the countries that import goods and services. Nigeria mainly import industrial supplies, transport equipment and spare-parts, capital goods, food, beverages and consumer goods and her main import partners are China, United States, Albania, France and Belgium (CBN, 2012).

In Nigeria, excessive importation of goods and services has serious implications on macroeconomic stability through imported inflation. It has also brought about balance of payment diseq uilibrium and impinges on

the credit rating of the country. In most cases, excessive importation leads to drain on foreign exchange reserves and further worsen the balance of payments. However, import is expected to propel growth if it is investment-induced (Englama *et al.*, 2013). Despite the fact that Nigeria's average aggregate imports have kept a substantial increasing profile within the period, the growth in the domestic economic activities appears non responsive (Ogbonna, 2015).

Figure 2.2



Source: World Bank Development Indicators (2019)

The trend above show the percentage of imports to GDP. Import trend line has shown to have fluctuated over the years from 1981 to 2019. After the Structural Adjustment Programme (SAP), there was a steady, yet fluctuating increase in importation hovering between 10 to 22 percent. This SAP was originally intended to make exports favorable and thereby reduce importation. However, the steady decrease in the manufacturing trend and the fluctuating import trend suggests that the manufacturing sector cannot meet up with the

domestic demand. Therefore, it resulted to importation to bridge the demand gap.

This illustration above brings to light, the concept of import penetration, which is the fulcrum of this investigation. Import penetration shows the extent to which domestic demand is satisfied by import. According to Brown, Howard, Jones and Spencer (2006), import penetration is therefore, the level at which the manufacturing sector of a country is overheated, the term "Overheated" means that a country's manufacturing sector has reached its climax and is unable to meet up with domestic demand, thereby complementing the difference through imports (Ngwudiobu, *et al.* 2018). The restriction on certain goods into the economy has further worsened and increased the demand level of some products. Such a situation tends to make the economy vulnerable to smuggling as the country is incapacitated to meet up with the rise in the demand for the restricted products, given its current explosive population. Ngwudiobu et al further noted that Nigeria's current trade restriction laws could be blamed on the country's inability to focus on industrialization as a result of the presence of crude oil which accounts for about 70% of the country's revenue.

Trade policy in Nigeria is geared towards promoting manufactured exports and enhancing linkages in the economy. The aim is not only to increase export revenues and reduce the country's reliance on the oil sector (Olaniyi, 2005) but also to discourage dumping, support import substitution, stem adverse movements in the balance of payment, conserve foreign exchange and generate government revenue (Bankole & Bankole, 2004). At independence, Nigeria adopted the Import Substitution Industrialization Strategy (ISI).

The Import Substitution Industrialization Strategy is a trade and economic policy used in replacing foreign imports with domestic production, it is a national development plan aimed at enhancing the performance of the manufacturing sector. It is based on the premise that a country should be able to reduce its foreign dependency through the local production of industrialized products. In Nigeria, this strategy has not been much of a success due to the feeble technology base of the economy. In 1986, the Structural Adjustment Programme (SAP) adopted by General Ibrahim Babangida was geared towards reducing the dependence on oil exports and promote non-oil exports, which should go beyond raw materials but locally manufactured products (Sola, Obayemi, et al. 2013). This policy was adopted as a significant shift in trade policy towards trade liberalization. Some of the aims of the Structural Adjustment Programme were diversification of the structure of production,

reduction in the over-dependence on petroleum exports and reduction in the over-dependence on imports. Unfortunately, there has been no significant progress made towards the achievement of these objectives. The economy is still overly dependent on petroleum exports while the degree of openness of the economy has increased.

CHAPTER THREE

LITERATURE REVIEW

3.1 CONCEPTUAL LITERATURE

3.1.1. Import Penetration

According to the General Agreement on Tariff and Trade (GATT, 1984), Import penetration ratios are used in such a way that imply a positive correlation between the values of the ratios and some notion of ‘’pressure’’ on the domestic industry. Import penetration ratio can be measured thus:

1. $\frac{Imports}{GDP - Exports} = \frac{Imports}{Domestic\ Demand}$

2. $\frac{Imports}{GDP}$

In the first measurement, import penetration is the ratio of imports to domestic demand. According to GATT (1984), this domestic demand is known as “apparent consumption’’. It does not include goods that are locally produced and exported. The main idea was to show how imports overheat the economy. Therefore an increase in this ratio shows an overheating rather than a decrease in the economy.

In the second measurement, import penetration is the ratio of imports to output. This measurement is supported by Brown *et al.* (2006) and also similar to Edwards and Jenkins (2015), which used sales in place of GDP. The second measurement excludes export which is beyond the scope of this study. Therefore, this study focuses on the first measurement as a substitute for measuring import penetration which is within the scope of this study.

The Organization for Economic Cooperation and Development (OECD, 2005) defines import penetration as the ratio between the values of imports as a percentage of total domestic demand. It shows the extent to which a country's demand is satisfied by imports. Import penetration is seen as the level whereby demand for goods and services is being met by foreign producers rather than domestic producers. Therefore, import penetration as a concept is inimical to the development of any economy.

Developing countries depend on importation to fill their output gap (the difference between actual GDP and potential GDP) making their import penetration ratio to be relatively high (which is reasonably detrimental). For highly industrialized countries like China, Japan, and the United States of America, import penetration are relatively low (which is very healthy to development). In that their manufacturing capacities are much greater than that

of developing countries, there is every tendency that they (developed countries) can meet up with the demands of the developing countries. Therefore such industrialized countries tend to have a relatively low import penetration.

3.1.2 The Nigerian Manufacturing Sector

Anyanwu, Oyefusi and Dimowo (1997) sees manufacturing sector as a sub-set of the industrial sector which involves the conversion of raw materials into finished consumer goods or, semi-finished/producer goods.

Manufacturing sector is an important sector which Nigeria need to meet the development needs, as it is accepted that exports of manufactured product is an important and essential means for the economic to attain sustainable and growth and poverty reduction. According to Adenikinju (2000) the manufacturing sector is an aspect of the economy responsible for the conversion of raw materials to semi-finished goods and then to finished goods. The sector is seen to be the engine of growth and that is why it is accorded the status priority in any administration.

Manufacturing Sector is the sector in an economy that is engaged in the production of merchandise for its demand by utilizing labour, capital and technical know-how which propels economic growth. Manufacturing is the process of transforming raw materials into finished goods. Manufacturing is

one of primary wealth generating activities for any economy around the world (Chryssoluris, 2005).

According to Mbelede (2012), manufacturing sector is involved in adding value to raw materials by turning them into finished or semi-finished product. The manufactured product can either serve as a finished goods for sale to consumers for final consumption or as intermediate goods used in the production process (Falade & Olagbaju, 2015). Activities in the manufacturing sector includes: agro processing, plastic or metal, or electrical, textile, clothing, footwears, cement and building (Falade & Olagbaju). These activities contribute significantly to the economy as a whole in terms of output goods and services, providing a means of reducing income disparities, develop a pool of semi-skilled and skilled labour for future industrial growth, improve forward and backward linkages within the value chain and between socially and geographical diverse sectors of the country, offer an excellent breeding ground for managerial and entrepreneurial talent and serve as a source of foreign exchange for the economy (Imoughele & Ismaila, 2014).

According to Adofu and Tijani (2015) manufacturing is seen as the merchandise for sale or use through the application of machines, labour, tools, chemical and biological formulation. It involves both handicraft and human

activities and high technology by transforming of unfinished goods to finished goods.

3.2 THEORETICAL LITERATURE

3.2.1. Import Penetration

One of the benefits of international trade according to international trade theories is that countries are able to access goods and services that are not produced locally. Rodrik (1999) argued that the benefit of trade lies on the import side rather than on the export side. The import-led-hypothesis argued that imports could be growth enhancing. Aigheyisi (2015) argues that this transpires if there is preponderance of capital goods over consumption goods in the composition of a country's imports and that the benefits may not be instantaneous as the short-run effect may be adverse, suggestive of a J-curve effect. However, where there is preponderance of consumption goods over capital goods in a country's import composition, the short-run and long-run effects of import penetration on economic growth may be detrimental. Hausmann and Rodrik (2003) attribute poor growth to reduction in foreign trade and investment as well as reduction in importation of capital equipment and intermediate goods. Barro and Sala-i- Martins, 1995 cited in Mejia (2011) suggest that imports give domestic producers access to wider variety of capital

goods and this engender expansion of production efficiency. Kim, Lim and Park (2007) gave a brilliant work of the theoretical relationship between imports and productivity growth and economic growth. According to the researcher, under favourable economic conditions, increase in importation of consumer goods encourages domestic import-substituting firms to innovate them to compete with foreign rivals. This leads to enhancement of productivity efficiency. The effect of trade openness on productivity gains depends on market structure and institutional factors. In the short-run, under perfect competition in the neoclassical model, industrial factor usage is reduced consequent upon removal of trade and opening of market to imports. Meanwhile industry becomes more competitive and productive and tends to expand its investment in new technology in the long-run. This results in rightward shift of the industry supply curve.

In further explanation, Kim, Lim and Park (2007) explains that under imperfect competition (which is the ideal market structure) removal of trade barriers which leads to an increase in imports, cause an import-substituting domestic market to decline and this causes productivity and investment to fall. Expectation of rise in future profits leads to more investment in active research and development and this may be greater for export firms than import substituting firms which are relatively affected by import openness.

Importation of capital and intermediate goods which are not produced locally makes domestic firms to diversify and this further enhance their productivity.

The summary of Kim, Lim and Park (2007) study is that import of semi-finished goods and capital goods that cannot be produced domestically enhances the productivity of exporting firms and enables them to diversify at least in the short-run. Therefore productivity gains are engendered by import diversification. Sani, Bashir and Musa (2005) discovered that the more importation of consumer goods, local firms compete with foreign competition and rivalry for modernization of industries.

In the line of argument, Grossman and Helpman (1991); Rivera-Batiz and Romer (1991) and Romer (1991) stated that imports give firms access to cheaper, better and domestically unavailable inputs and equipments. As a result, they boost productivity and reduce production costs, making production of raw goods profitable and possible. Melitz (2003) and Bernard et al (2003) also shows that import competition leads to an average productivity increase, as most productive firms expand while the less productive domestic firms exit.

Kaldor (1996) predicts that an increase in imports ratio (that is imports as percentage of GDP) is associated with a decrease in the rate of growth of output which is inversely related to the export ratio that is export as percentage

of GDP). The Kaldor hypothesis predicts that an increase in export ratio is not autonomous, but due to adversely effect of import penetration. Kennedy and Thirwall (1979) agreed with Kaldor's argument that autonomous increase in imports may lead to stagnation of domestic output relative to exports in developing countries.

3.2.2. Manufacturing Sector

Kaldor (1966) opines that the manufacturing sector is the engine of growth for any nation who tends to promote the growth and development in its economy. According to Kaldor, manufacturing sector tend to expand by drawing labour from other sectors of the economy in which diminishing returns exists. Thus, productivity intentionally increases due to the fact that average product of labour is greater than the marginal product. Therefore, the more output of the manufacturing sector increases, the more productivity growth grows faster in the economy which serves as the key determinant of Gross Domestic Product (GDP) and standard of living.

Kaldor (1966) stated three laws which identify how economic growth is affected by the manufacturing sector in an economy. Kaldor noted that an increase in the output of manufacturing sector leads to an improvement in national output in an economy. He opines that the developed and fastest

growing countries in the world are industrialized nations in which the contribution of the manufacturing output to GDP is expanding rapidly. Kaldor's law as citied in Teshome (2014) also opines that increase in the productivity of labour is based on inputs from the manufacturing sector. Pons and Viladecans (1998) expressed that the manufacturing output growth has positive nexus with GDP growth rate, which means the manufacturing sector leads to higher productivity than other productive sectors in the economy.

Thomas (2003) stated that there are three principal themes in any manufacturing sector of an economy. These are solution base –high innovation, technology and innovation. These are the main keys for sustaining competitiveness and growth in the level of productivity. Manufacturing sector is the growth-led sector, in that it leads to increase in economic growth via increasing return, which is a macroeconomic phenomenon because it resulted from increasing return to scale.

Additionally, Szirmai and Verspagan (2011) argued in similar lines with Kaldor (1966). In their work, they elaborated the role of manufacturing sector and its effect on economic growth mostly in developing countries during the period of 1950 – 2005. In their paper, they discuss about the concept of manufacturing sector being the engine of growth for any nation. Firstly, the

level of productivity in manufacturing sector is greater than that of the agricultural sector or service sector. Secondly, the manufacturing sector provides economies of scale more than the agricultural sector and the service sector. Thirdly, the manufacturing sector requires the involvement of greater capital stock to produce goods. Lastly, the manufacturing sector has strong spillover and backward and forward linkages. In the study of Tybout (2000), it focused on the presence of manufacturing firms in the developing countries. Tybout argues that through the manufacturing sector a country steps into the era of modernization. It brings about job creation for the citizens and generally, it has a positive spillover effect in the economy.

Enebong (2003) observed that the level of manufacturing sector performance in Nigeria will continue to decline due to the fact that there is usually great difficulty for manufacturers to gain access to raw materials as a result of their competition with foreign firms. Enebong theories that many policies implemented by the government as at 1990s are still acting as barriers to manufacturing sector growth. These policies include backward integration and the inward orientation strategies towards import substitution.

According to neoclassical proposition of Solow (1956) the relationship between manufacturing and growth is analyzed under the diminishing

marginal productivity of capital, constant returns to scale, technical progress that are exogenously determined and substitutability between labor and capital. Solow stated that investment and savings are very necessary factors responsible for immediate growth in the economy. In the long-run, Solow identifies sophisticated technology and progress as the key factor responsible for development in the economy, even though technology is treated as exogenous in the economy. The approach of neoclassical growth, though it favors capital labor as indexes of growth in the economy, the growth in technology considered as exogenous, still remains unexplored (Olorunfemi 2013).

Oyati (2010) stated that developed countries that could harness its power attain higher profitability, prosperity and significant in their economies. For instance, the experience of the developed countries and emerging economies of India, Singapore, Malaysia, China and North Korea showed the positive relationship between economic growth and manufacturing sector (Banjoko, Iwuyi & Bangshaw, 2012). Similarly, developing nations who are oriented agrarian and services in the past also formulated several initiatives to sustain development and growth in the manufacturing sector.

Rodrik (2007) in his study on industry development did indicate that rapid economic growth does not necessary be related to manufacturing but however, he mentioned that ‘’growth accelerations are associated with structural changes in the direction of manufacturing’’. Rodrik describes rapid economic growth with the example of the East Asian countries due to the presence of large manufacturing sector. He further clarified that manufacturing may simultaneously increase employment and international trade, that is, expansion of exports; which basically again contributes to the GDP growth.

In a report published, Manyika (2012) examines the changing role of manufacturing and its future growth. The analysis mentioned the continued importance of the manufacturing sector in both developing and developed countries due to its contribution towards economic growth and the improvement of the living standards of the citizens. However, the report does talk about the changing nature of manufacturing. The report talks on the current shifting trend of manufacturing towards the developing countries. For instance, the popularly known service led economy, India, has recently set goals to develop its manufacturing sector share in GDP from 16 percent to 25 percent by 2022 (Manyika 2012). The report also talked about the role of manufacturing as a source of employment generation and at the same time through the manufacturing sector, an economy opens prospects for the local

industries to capture the local markets and later exports resulting in the trade surplus.

3.3 EMPIRICAL LITERATURE

Economic theories reviewed tend to establish a link between import penetration and manufacturing sector. Conventional economic wisdom would suggest that when the manufacturing sector cannot provide for the domestic economy, the economy sees importation as the second best alternative. Given the dearth of literature on import penetration, this study will also look at other attributes of international trade like trade openness, trade liberalization, imports and exports and their interplay with economic growth of Nigeria and other economies.

Dutta and Ahmed (2001) examined the relationship between trade liberalization and manufacturing sector in Pakistan using cointegration analysis within the endogenous growth model framework. The study found a significant relationship between the measures of trade liberalization and growth of the manufacturing sector.

Chete and Adenikinju (2002) studied the impact of trade liberalization on productivity growth in the manufacturing sector for the period of 1988 to 1990. The study showed that trade liberalization to be growth-enhancing.

Adebiyi and Dauda (2004) investigated the relationship between trade liberalization and manufacturing sector performance using an error correction mechanism (ECM) techniques on annual data from 1970 to 2002. The study showed that trade liberalization, measured as degree of openness, to be a significant determinant of manufacturing production in Nigeria. Ehinomen and Da' Silva (2004) investigated the impact of trade openness on the output growth in the Nigerian economy. The study showed that trade openness has a positive impact on output growth in Nigeria.

Wong (2007) studied the pro-competitive effect of trade liberalization on Ecuador's manufacturing sector during the period 1997 to 2003 using panel data of establishment and regressed price-cost margin (PCM) on import penetration. The study showed an inverse relationship import penetration and PCM, which implied that trade liberalization brought about market discipline effect in Ecuadorian manufacturing industries and establishments.

Chandran and Munsamy (2009) investigated the long-run relationship trade openness and manufacturing sector in Malaysia using time series data from the period of 1970 to 2003. The study showed that trade openness had a positive significant effect on manufacturing value added, particularly in the long-run, thus emphasizing the benefits of openness as a long-run affair. Njikam and

Cockbum (2011) examined the effect of trade liberalization on firm productivity growth in Cameroons manufacturing sector for the period 1988/1989 to 2001/2002. The study employed micro data to derive the productivity for the firm using the method by Levinsohn and Petrin (2003). Also the effect of trade liberalization of firms productivity growth was determined by a regression framework, with variables including import penetration, export shares and effective protection, measuring the extent of trade liberalization. The study showed that increase in export shares, and reduction effective protection led to the improvement in the productivity of the manufacturing sector in Cameroon. While import penetration did not have significant effect on firms productivity growth of the manufacturing sector in Cameroon.

Adegbemi, Ismail and Muhibat (2012) studied the impact of trade openness on manufacturing sector performance in Nigeria using a time series data from the period 1975 to 2010. The study found that trade openness is positively related to the performance of the manufacturing sector. While inflation rate, exchange rate have a negative effect on the manufacturing sector in Nigeria.

Onakoya, Fasanya and Babalola (2012) studied the relationship between trade openness and manufacturing sector performance in Nigeria. The study shows

that trade openness is positively related to the growth in the manufacturing sector. Also Umoh and Effiong (2013) established the relationship between trade openness and manufacturing sector performance in the Nigerian economy. The study shows that trade openness has a positive and significant relationship on manufacturing productivity in Nigeria. Agu (2017) in a current research found that trade openness positively impact on the growth of manufacturing sector in Nigeria. This establishes a fact that as the economy of Nigeria is open to trade, there is an improvement in the manufacturing sector.

Olanrewaju (2013) examined the effect of trade liberalization on manufacturing sector performance in Nigerian economy. The study found that trade openness Granger causes performance in the manufacturing sector. Ebenyi (2017) studied the impact of trade liberalization on manufacturing value added in the Nigerian economy. The study found that ever since Nigeria embraced open trade policy, there has not been much performance in the manufacturing sector of the economy. This could be as a result of the deteriorating nature of import penetration in Nigeria.

Ngene, Nwele and Uduimoh (2016) studied the impact of imported manufactured goods on the Nigerian manufacturing sector performance using employed econometric analysis with ordinary least square (OLS) method of

data estimation and analysis and augmented dickey fuller test to conduct unit test to ensure the stationary states of the variables used. This study showed a positive statistically significant relationship between manufacturing sector output and manufactured imports in Nigeria.

Oyekinka and Adegboye (2017) examined the impact of trade liberalization on the Nigerian manufacturing sector performance using the generalized method of moment technique from the period 1981 to 2014. The study found that trade liberalization had negative and significant impact on manufacturing sector performance in Nigeria.

Ngwudiobu, Aidi and Fadeyi (2018) using the classical linear regression model (CLRM) within the OLS estimation framework, examined the relationship between manufacturing sector and import penetration in Nigeria from the period 1981-2017. The study found that import penetration, trade openness and government expenditure are significant in influencing the activities of the manufacturing sector in Nigeria. Import penetration had a negative impact while trade openness and government expenditure showed positive impacts.

Adekunle and Akinwale (2020) examined the relationship between trade liberalization and manufacturing sector in Nigeria from the period 1986 to

2018 using autoregressive distributed lag (ARDL) and pairwise granger causality econometric techniques. The study found that trade liberalization has significant and indirect impact on productivity of manufacturing sector in Nigeria.

3.4 LIMITATIONS OF PREVIOUS STUDIES AND VALUE ADDITION

The literature reviewed so far has revealed that much is yet to be done on import penetration both globally and locally. There is no much work done on the conceptual and theoretical literature and most of the literatures reviewed in the theoretical literature were not home-based. This suggests that researchers are yet to embrace the concept of import penetration for further studies. While that of the manufacturing sector a lot of literature were reviewed but we are not really aware of any other study which has investigated the relationship between import penetration and manufacturing sector in Nigeria.

From the literature reviewed, Ngwudiobu *et al.* (2018) seems to be much closer to this study. However, this study will go further by determining the relationship amongst import penetration, manufacturing sector and economic growth.

CHAPTER FOUR

METHODOLOGY

4.1 THEORETICAL FRAMEWORK

Our framework for this study pivots around the income identity equation. Since this study is focused on import penetration and manufacturing sector, we will go beyond the two sector model (which comprises of output as a function of consumption and investment) to the three sector model that includes trade balance (the difference between exports and imports). The national income identity equation is given as:

$Y = C + I + G + (X - M)$……
……(1)

The above identity, shows that Income (Y) comprises of Consumption (C), Investment (I), Government purchases (G), and Net export or Trade balance (difference between Exports (X) and Imports (I)).

Our interest from this identity is investment. From here, this study adopts the accelerator principles of investment theory as specified in Iyoha (2004) as:

$I = I(r, \Delta Y)$ ……(
2)

$I_r < 0, I_{\Delta Y} > 0$

Equation (2) tells us that investment (I) is a function of interest rate (r) and change/growth in output (ΔY). An increase in interest rate here is expected to reduce investment, while an increase in the change/growth of output is expected to increase investment.

To expand the model in equation (2), we loosely say that investment in any developing economy is hampered by imports. This is on the premise that infant industries are at a high disadvantage when the influx of imports is high. Therefore, adopting and modifying the model, we include imports (M) to the framework.

$I = I(r, \Delta Y, M)$ ..... (3)

$I_r < 0, I_{\Delta Y} > 0, M < 0$

In addition to the modified model, an increase in the value of imports is expected to have a negative impact on investment given our assertion.

4.2 MODEL SPECIFICATION

The focal point of this study is to model the impact of import penetration on manufacturing sector in Nigeria. However, from our framework, we adopt the modified accelerator principles of investment (equation 3). The variable, manufacturing sector/output, will be used as a proxy or surrogate for investment. This is because, aside the investments in other sectors of the economy, particularly in Nigeria, there seems to be investment in the manufacturing sector as this deals with the creation of goods and services. In addition, imports will be further extended to show import penetration.

MODEL

The model to capture the objectives for this study (which is the impact of import penetration and imports on manufacturing sector in Nigeria) will be specified mathematically, statistically and econometrically. The mathematical expression of the model is given below:

$$Mfs = f(Impn, M, Yg, r, Top, Inf) \quad \text{……...……} \quad \text{…(4)}$$

where:

Mfs = Manufacturing sector/output

f = Functional relationship

$Impn$ = Import penetration (measured as the ratio of imports to domestic demand – the difference between GDP and exports)

Yg = Output growth

r = Interest rate

Top = Trade openness (measured as the ratio of import plus exports to GDP)

Inf = Inflation

The statistical representation of the mathematical expression in equation (4) is given as

$Mfs_t = \alpha + \beta_1 Impn_t + \beta_2 M_t + \beta_3 Y_{g_t} + \beta_4 r_t + \beta_5 Top_t + \beta_6 Inf_t$ ………… …………………..(5)

The econometric form of the model is given as

$Mfs_t = \alpha + \beta_1 Impn_t + \beta_2 M_t + \beta_3 Y_{g_t} + \beta_4 r_t + \beta_5 Top_t + \beta_6 Inf_t + \mu_t$ …… …………………..(6)

We log the model in equation (6) so as to interpret it on an equal footing (in percentages). This will enable the model to be interpreted in percentage.

$$lnMfs_t = \alpha + \beta_1 lnImpn_t + \beta_2 M_t + \beta_3 lnY_{g_t} + \beta_4 lnr_t + \beta_5 lnTop_t + \beta_6 lnInf_t + \mu_t \ldots\ldots\ldots (6')$$

Where the introduction of the stochastic term (μ_t) , makes equation (6) an econometric equation. This stochastic term or error term captures other variables affecting the dependent variable that is not included in the model. In addition, to avoid running a regression with outliers (a situation where we have missing variable and tempted to use zero), any variable containing negative values will not be logged (the log of a negative value is zero).

The parameters/coefficients from $\beta_1$to β_5 will be subject to estimation, clearly stated under the estimation method or procedure.

The a priori of the model in equation (6') is given as

INDEPENDENT VARIABLES	EXPECTATION	
LOGIMPN	Negative (-)	$\boldsymbol{\beta_1} < 0$
LOGM	Negative (-)	$\boldsymbol{\beta_2} < 0$
YG	Positive (+)	$\boldsymbol{\beta_3} > 0$
LOGR	Negative (-)	$\boldsymbol{\beta_4} < 0$
LOGTOP	Negative (-)	$\boldsymbol{\beta_5} < 0$
LOGINF	Negative (-)	$\boldsymbol{\beta_6} < 0$

4.3 EVALUATION/ESTIMATION METHOD

This study employs the classical linear regression model (CLRM) with the Ordinary Least Square (OLS) estimation technique. This is because, unlike other estimation techniques, OLS has its unique properties known as the BLUE (Best Linear Unbiased Estimator) property. Three criteria are adopted in order to evaluate the result obtained from the regression analysis. They are;

i. Evaluation based on economic a priori conditions or criteria,

ii. Evaluation based on statistical criteria, and

iii. Evaluation based on econometric criteria.

Evaluation Based on the Economic a priori Criteria

This subsection of this chapter draws inference from economic theory. This is used to examine the economic usefulness of the equation with regards to meeting the a priori expected signs of the parameters. The sign ‘‘+’’ indicates that the explanatory variable has a direct relationship with the explained (dependent) variable, while the sign ‘‘–’’ indicates that the explanatory variable has an inverse relationship with the explained variable. The theoretical a priori expected signs of the macroeconomic variables in the models will be analyzed in the next chapter.

Evaluation Based on Statistical Criteria

1. The R^2 (coefficient of determination)

The R^2 shows the goodness of fit of the regression. It shows how well or to what extent does the explanatory variables (regressors) explains the explained variable (regressand).

2. The t – test

The t – test shows the individual impact of the independent variables and its usefulness to the model. A two – tailed test is conducted at 5% level of

significance, under n – k degrees of freedom. Where n is the number of observation and k is the number of samples.

Decision rule:

The null hypothesis:

H_0: $\beta_1 : \alpha_1 \neq 0$

If $t_{cal} > t_{0.025}$

Reject the null hypothesis H_0 on the ground that it is insignificant and accept the alternative (H_1). Otherwise accept the null hypothesis (H_0).

From the above, t_{cal} is the computed t – ratio, while $t_{0.025}$ is the tabulated t – ratio.

However, an alternative approach is to use the 2 *t* rule of thumb. This means that any coefficient greater than two in absolute term is significant as long as the sample size is greater or equal to thirty (≥ 30). Otherwise, it is not significant (Gujarati & Porter, 2009).

3. The F – test

The F – test is used to test the overall significance of the regression model. It will also be carried out at 5% level of significance

Decision rule:

H_0: The regression parameters are equal to zero (wrong model specification).

$H_{1:}$ The regression parameters are statistically different from zero (correct model specification).

If:

$F_{cal} > F_{0.05}$

Reject the null hypothesis (H_0) and accept the alternative (H_1) on the ground that the result is significant. Otherwise, accept the null hypothesis (H_0).

Evaluation Based on Econometric Criteria

1. Autocorrelation Test

The Durbin–Watson d – statistic will be used to test the randomness of the residuals or more specifically for testing the presence of autocorrelation in the error term (U_i).

Tabulated decision rule:

Null hypothesis (H_0)	Decision	If
No positive autocorrelation	Reject	$0 < d^* < d_L$
No positive autocorrelation	No decision	$d_L \leq d^* \leq d_U$
No negative correlation	Reject	$4 - d_L < d^* < 4$
No negative correlation	No decision	$4 - d_U \leq d^* \leq 4 - d_L$
No autocorrelation, positive or negative	Do not reject	$d_U < d^* < 4 - d_U$

where:

d^* = computed Durbin-Watson d–statistics.

d_L = lower bound

d_U = upper bound.

2. Normality Test

The normality test adopted is the Jarque – Bera (JB) Test of normality. Thus JB test for normality is an asymptotic or large samples and it is based on the

OLS residuals. This test computes the skewness of the OLS residuals. The test statistic is the Jarque-Bera using its probability value.

Hypothesis:

H_0 : $\sigma 1 = 0$ (the error term are normally distributed).

H_1 : $\sigma 1 \neq 0$ (the error term are not normally distributed).

The decision rule is to reject H_o if the Jarque-Bera probability value is less than 5%. Otherwise, do not reject.

3. Heteroscedasticity Test

This test is geared towards ascertaining the nature of variance of the error term. That is, it helps to detect if the variance error term is constant. Homoscedasticity shows equal spread or equal variance, while heteroscedasticity shows an unequal spread or an unequal variance.

H_0: Homoscedasticity

H_1: Heteroscedasticity

The decision rule is to reject H_0 if $\chi^2_{cal} < \chi^2_{0.05}$ and accept if otherwise.

4.4 SOURCES OF DATA

The data employed in this research are secondary annual data obtained from the World Bank, World Development Indicators (WDI, 2019). The period this study intends to cover is from 1981-2019 a period of thirty eight years (39 years).The main variable of interest in this study are manufacturing sector (contribution of manufacturing output to GDP), imports, import penetration, real interest rate and output growth, while two control variables were employed based on the literature reviewed. They are trade openness and inflation. Some variables like import penetration and trade openness will be obtained by applying its formula.

CHAPTER FIVE

PRESENTATION AND ANALYSIS OF RESULTS

5.0 INTRODUCTION

This chapter of the study presents the regression result of our estimated model, the analysis and interpretation of our regression result.

5.1 UNIT ROOT TEST

Usually in economic analysis of macroeconomic phenomena, researchers are often faced with the problem of deriving stationarity in the time series variables incorporated in the study of interest given the poor data collation technique in Nigeria. Thus, this prompts the relevance of conducting the unit root test to realize the stochastic process in the time series analysis. The table below presents the unit root results using the Augmented Dickey Fuller (ADF) tests.

Table 5A: Results of Unit Root Tests

Variables	ADF Statistics (level)	MacKinnon Critical Values at 5%	Remark	ADF Statistics (1st Difference)	MacKinnon Critical Values at 5%	Order of Integration
MFS	-1.550682	-1.949856	NS	-7.826377	-1.950117	I(1)
IMPN	-3.315089	-1.949856	Stationary	-	-	I(0)
Yg	-1.937025	-1.950117	NS	-10.24867	-1.950117	I(1)
R	0.071931	-1.950394	NS	-5.427890	-1.950394	I(1)
TOP	-1.987989	-1.949856	Stationary	-	-	I(0)
INF	-1.881782	-1.949856	NS	-5.760887	-1.950117	I(1)
M	-1.721303	-1.949856	NS	-5.318812	-1.950117	I(1)

Source: Author's compilation from E-views 9 (NS means not stationary at levels)

The table above shows the result of the unit root test for the variables, using the ADF test. Given the above result, the ADF test proves the variables which includes manufacturing output, output growth, real interest rate, inflation and imports are not stationary at level but at first difference. Therefore, we say that they are integrated of order one. That is, they are all stationary after first differencing. However, import penetration and trade openness were stationary at level. That is to say that they are integrated of order zero.

5.2 ANALYSIS OF REGRESSION RESULT

Since the dependent variable and at least one other independent variable are integrated of other one, there tend to be suspicion of a long-run relationship amongst variables. Thus, the two step Engel-granger cointegration test was conducted and the result shows that the residual (from the output of objective one regression result) is stationary at level at 5% level of significance.

Table 5B: Engel-granger Cointegration Test

Variables	**ADF Statistics (level)**	**MacKinnon Critical Values at 5%**	**ADF Statistics (1st Difference)**	**MacKinnon Critical Values at 5**	**Order of Integration**
ECT	-4.5254	-1.9501	-	-	I(1)

Source: Author's compilation from E-views 9

The table above shows that the error correction term (ECT) is stationary at level. Haven confirmed the presence of long-run relationship; an error correction model (ECM) was conducted, which is statistically significant at 5% level. The error correction model shows how the long-run model is corrected in the short-run. According to Gujarati and Porter (2009), given that

the deviations of the long-run and short-run component of the model have been corrected, the regression result will not be considered as spurious.

Below is the presentation of the regression result that achieved the two objectives of this study; which is to determine the impact of import penetration and imports on manufacturing sector in Nigeria.

Table 5C: LONG-RUN REGRESSION RESULT

Dependent Variable: LOGMFS: The Log of Manufacturing Sector/output (MFS)

Variable	**Coefficient**	**Std. Error**	**t-Stat.**	**Prob.**	**REMARK**
Constant	**24.465**	1.429	17.126	0.000	**Statistically significant**
LOGIMPN	**0.905**	0.119	7.583	0.000	**Statistically significant**
LOGM	**-0.744**	0.050	-14.858	0.000	**Statistically significant**
YG	**-0.020**	0.005	-3.840	0.001	**Statistically significant**
LOGR	0.054	0.093	0.591	0.559	Not statistically significant
LOGTOP	**-0.771**	0.297	-2.596	0.014	**Statistically significant**
LOGINF	-0.022	0.036	-0.623	0.538	Not statistically significant
R^2 93% Adjusted R^2 91% F. Statistic 68.21					
F. Statistic (Probability value) 0.00					
Durbin-Watson statistic 1.376					

Source: Author's compilation from E-views 9

By way of description, LOGIMPN is the log of import penetration, LOGM is the log of imports, YG is output growth – it is not logged because it is in percentage and contains negative values, LOGR is the log of interest rate, LOGTOP is the log of trade openness, and LOGINF is the log of inflation rate.

Table 5D: SHORT-RUN ERROR CORRECTION MODEL

Dependent Variable: D(LOGMFS) Manufacturing Sector/output (MFS)

Variable	**Coefficient**	**Std. Error**	**t-Stat.**	**Prob.**	**REMARK**
Constant	-0.009	0.016	-0.585	0.563	Not statistically significant
D(LOGIMPN)	0.452	0.341	1.326	0.195	Not statistically significant
D(LOGM)	-0.239	0.234	-1.022	0.315	Not statistically significant
D(YG)	**-0.009**	0.004	-2.273	0.030	**Statistically significant**
D(LOGR)	-0.162	0.107	-1.513	0.141	Not statistically significant
D(LOGTOP)	-0.503	0.283	-1.777	0.086	Not statistically significant
D(LOGINF)	-0.017	0.024	-0.727	0.473	Not statistically significant
ECT(-1)	**-0.405**	0.158	-2.565	0.016	**Statistically significant**
R^2 31%		Adjusted R^2 15%			F. Statistic 1.92
F. Statistic (Probability value) 0.10					
Durbin-Watson statistic 1.832					

Source: Author's compilation from E-views 9
The D operator represents first difference of the variables.

Table 5C and Table 5D shows the long-run model and short-run model respectively. The R squared shows the goodness of fit of the model. In the

long-run model, it shows that about 93% of the variations in the dependent variable are explained by the independent variables. The F test shows the overall performance of the regression model. The F. statistic (Probability value) of 0% is significant because it is less than 5%. Therefore, we conclude that the model is well specified and adequate for policy analysis. The Durbin-Watson statistics is rather weak and shows a suspicion for the presence of autocorrelation in the model. The test of significance will be following the 2–*t* rule of thumb, a *t* value greater than two (2) in absolute term is statistically significant as long as the sample size is more than 30 (Gujarati & Porter, 2009).

Therefore given the above satisfaction, we interpret the long-run and the short-run result simultaneously. The constant coefficient is positive and statistically significant at 5% level of significance. This shows that holding the entire variables constant (equal to zero), the manufacturing sector will improve by 24.5 percent. This interpretation does not have much relevant but rather for pedagogical purpose.

In the long-run, the coefficient of import penetration is positive and statistically significant. This means that holding all other variables constant, a one percent increase in import penetration will increase manufacturing sector performance or output by 0.90 percent. This finding contradicts that of

Ngwudiobu *et al.* (2018) which rather showed a negative impact on manufacturing sector. However, in the short-run import penetration is not statistically different from zero. Therefore, there is no need for further interpretation.

The coefficient of imports in the long-run shows a negative relationship with manufacturing sector. This means that holding the influence of other variables constant, a one percent increase in imports will reduce manufacturing sector by 0.74 percent. However, in the short-run, imports are not significant at the 5% level of significance. Therefore, no further interpretation is needed.

Output growth with the coefficient of -0.02 appears to be negative and statistically significant in the long-run. This implies that holding other variables constant, a one percent increase in output will reduce the manufacturing sector performance by 0.02 percent (this has a small effect in magnitude). However, in the short-run, the coefficient of imports is also negative and statistically significant at 5% level of significance. This means that holding other variables constant, a one percent increase in imports will in the short-run reduce the manufacturing sector output by 0.009 percent (a rather lower value in magnitude than the long-run).

Interest rate has a positive coefficient and negative coefficient in the long-run and short-run respectively but none is statistically significant. Since they are both not statistically significant, it indicates that it is not important to this study and hence no need to be interpreted.

The coefficient of trade openness is negative and statistically significant to impacting on manufacturing sector output in the long-run. This means that holding other variables constant, a one percent increase in trade openness will reduce manufacturing output by 0.77 percent. However, trade openness has no short-run impact as the variable is not statistically significant.

Inflation rate depicts a negative relationship both in the long-run and the short-run. However, none was statistically significantly different from zero. Given this situation, there will be no point interpreting this result.

The error correction term (ECT) in the error correction model (ECM) reveals that about 41% of the short-run disequilibrium between the dependent and independent variables will be adjusted within the period of one year.

The a priori expectation of the result is given below:

Table 5E: Expected Signs and Actual Signs

Independent Variables	Expectation	Actual Sign	Remark
LOGIMPN	Negative (-)	Positive (+)	**Does not conform**
LOGM	Negative (-)	Negative (-)	**Conforms**
YG	Positive (+)	Negative (-)	**Does not conform**
LOGR	Negative (-)	Positive (+)	**Does not conform**
LOGTOP	Negative (-)	Negative (-)	**Conforms**
LOGINF	Negative (-)	Negative (-)	**Conforms**

Source: Author's observation

The error term of the model is normally distributed; there is no serial correlation and no heteroskedasticity as shown in the appendix. More so, this is shown below:

Table 5F: RESIDUAL DIAGNOSTIC TEST

TEST	TEST STATISTIC		CONCLUSION
Normality	Jarque-Bera (Prob.)	0.60	Normally distributed
Serial correlation	Chi-square	0.08	No serial correlation
Heteroskedasticity	Chi-square	0.86	Homoskedastic (equal spread)

Source: Author's compilation from E-views 9

5.3 EVALUATION OF RESEARCH HYPOTHESES OF THE STUDY

Based on the findings from the results, the following are the evaluation of the hypotheses of the study.

H_{01}: Import penetration has no significant impact on manufacturing sector in Nigeria.

Conclusion: From the regression result, using the 2 *t* rule of thumb, import penetration is positive and statistically significantly different from zero. Therefore, we reject the null hypothesis and conclude that import penetration has a significant impact on the manufacturing sector in Nigeria.

H_{02}: Imports have no significant impact on manufacturing sector in Nigeria.

Conclusion: The second regression result as shown on Table 5f is negative and statistically significant using the 2 *t* rule of thumb. Therefore, we reject the null hypothesis and conclude that imports have a significant impact on the manufacturing sector in Nigeria.

CHAPTER SIX

SUMMARY OF FINDINGS, POLICY RECOMMENDATIONS AND CONCLUSIONS

6.1 SUMMARY OF FINDINGS

The primary objective of the study was to examine the impact of import penetration on manufacturing sector in Nigeria. Specifically, the study focused on the impact of import penetration and also imports on manufacturing sector/output in Nigeria.

The study utilized the classical linear regression model (CLRM) within the ordinary least square (OLS) estimation framework. One equation achieved both objectives since the dependent variable is the same for them. The estimation of the impact of import penetration and imports on manufacturing sector in Nigeria including four (4) control variables consisting of; output growth, interest rate, trade openness and inflation to also explain the dependent variable.

From the result presented in the previous chapter, it is evident that import penetration has a positive impact on manufacturing sector in Nigeria in the long-run and not in the short-run. The magnitude of impact for one percent

increase in import penetration almost has a one percent increase in manufacturing output as the coefficient of import penetration shows 0.90 percent. Imports show a negative impact on the manufacturing sector in Nigeria within the long-run and none in the short-run. The magnitude is almost three-quarter of a one percent increase in imports as its coefficient shows -0.744. Output growth shows a negative impact on manufacturing sector in Nigeria in the long-run and also in the short-run with a coefficient of -0.02 and -0.009 respectively. The magnitude for a one percent change is very minute in the short-run than in the long-run. Lastly, trade openness shows a negative impact on manufacturing sector in the long-run and none in the short-run. This informs us that as a country becomes susceptible to external shocks, it becomes detrimental to the manufacturing sector in Nigeria in the long-run. Other control variables such as interest rate and inflation were neither significant in the long-run nor in the short-run and therefore had no impact.

Focusing on the implications of import penetration and imports, the positive impact of the former shows that as the economy is being heated up as a result of the influx of importation, there tend to be a counter reaction by the manufacturing sector to speed up her activities so as to bridge the gap already created as a result of excess demand. However, the negative impact of the latter (imports) shows that as an economy increases her imports it slows the

activities of the manufacturing sector. This however, makes us to appreciate the fact that there is a difference between the two main concepts (import penetration and imports).

6.2 POLICY AND RECOMMENDATIONS

This study emphasized the impact of import penetration and imports on manufacturing sector in Nigeria. Based on the findings from the study (given the period under investigation) and the observed implications, the following are the policy recommendations. They are:

1. The positive impact of import penetration implied that there is a challenge in the domestic economy, given the increase in demand already created by imports. Since there is now therefore a challenge within the economy, this study recommends that loans with minimum rate of interest be given to individuals in the manufacturing sector so as to close the gap already created. This will propel them towards expanding production so as to meet up with earlier deficiency in demand.
2. Sequel to the point above, the manufacturing sector should be creative so as to compete favorably well with the external economy. This is because as long as their product fails to meet up with the hitherto

imported products, imports tend to overshadow the domestic economy and the heat becomes more intense on the manufacturing sector.

3. The negative impact of imports on manufacturing sector shows that as imports increases, it represses the activities of the manufacturing sector, by implication. This study therefore recommends that exports be substituted for imports via invoking of the import substitution strategy.
4. Trade openness shows the rate or the extent at which a country is prone to external shocks as she opens herself to international trade. This means that it has a detrimental implication on the manufacturing sector. This study recommends that government agencies should ensure within her borders that substandard products with a low price tag do not flood the domestic market to the detriment of manufacturing sector in Nigeria.
5. As a corollary to the above (point number 4) this study recommends that imports be taxed while industries in the manufacturing sectors be given tax holidays. This will enable them to sell at a lower price while the foreign products appears more expensive (given the tax – both tariff and non-tariff methods).
6. Sequel to this, there should be a little romance between economics and psychology in that commodities produced in Nigeria should not be considered as fake while regarding foreign commodities as original.

The manufacturing industries should win back the confidence of the masses. A good application of this will create a good image for Nigerian products.

6.3 CONCLUSIONS

This study investigated the relationship between import penetration and manufacturing sector in Nigeria. In furtherance to this study, there was an extension to including imports and it was adequately investigated. This study covered the period 1981 to 2019 (a period of 39 years). The study used the classical linear regression model (CLRM) within the ordinary least square (OLS) method of estimation. Also, cointegration was detected and an error correction model (ECM) was carried out to correct the long-run error of the model in the short-run.

Import penetration was found to increase the activities of the manufacturing sector in the long-run, while imports were seen to hinder the activities of the manufacturing sector (repressed due to intimidation felt as a result of the proliferation of cheap imported products) in the long-run. Import penetration and imports are conceptually different. Import penetration is seen as the level whereby demand for goods and services is being met by foreign producers (through imports) rather than domestic producers. This is slightly conceptually

different from imports, as imports are the inflow of goods and services from foreign country(s) into the domestic economy. The results obtained in this study buttresses the fact that import penetration and imports have their conceptual differences. In addition, output growth has both a long-run and short-run negative impact on manufacturing sector while trade openness has a long-run negative impact.

The study recommends amongst other things for the government to encourage the manufacturing industries to expand in output by granting them loans with minimal interest and tax holidays. This is mainly to ensure that the manufacturing sector as a whole is able to meet up with the domestic demand and produce for exportation. This will be to the overall good of the Nigerian economy.

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APPENDIX

UNIT ROOT TEST

MANUFACTURING OUTPUT

At Level

Null Hypothesis: MANUFACTURING_OUTPUT has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.550682	0.1123
Test critical values:	1% level	-2.627238	
	5% level	-1.949856	
	10% level	-1.611469	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MANUFACTURING_OUTPUT)
Method: Least Squares
Date: 04/17/21 Time: 10:21
Sample (adjusted): 1982 2019
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MANUFACTURING_OUTPUT(-1)	-0.023207	0.014966	-1.550682	0.1295

		Mean dependent var	-0.303613
R-squared	0.017186		
		S.D. dependent var	1.424013
Adjusted R-squared	0.017186		
S.E. of regression	1.411724	Akaike info	3.55346

		criterion	3
			3.59655
Sum squared resid	73.73966	Schwarz criterion	8
		- Hannan-Quinn	3.56879
Log likelihood	66.51580	criter.	6
Durbin-Watson stat	2.621222		

At First Difference

Null Hypothesis: D(MANUFACTURING_OUTPUT) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.826377	0.0000
Test critical values:	1% level	-2.628961	
	5% level	-1.950117	
	10% level	-1.611339	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MANUFACTURING_OUTPUT,2)
Method: Least Squares
Date: 04/17/21 Time: 10:22
Sample (adjusted): 1983 2019
Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MANUFACTURING_OUTPUT(-1))	-1.259628	0.160947	-7.826377	0.0000

		Mean dependent	-0.001432
R-squared	0.629828	var	

		S.D. dependent var	2.344243
Adjusted R-squared	0.629828		
		Akaike info criterion	3.574669
S.E. of regression	1.426278		
			3.618207
Sum squared resid	73.23369	Schwarz criterion	
		- Hannan-Quinn criter.	3.590018
Log likelihood	65.13137		
Durbin-Watson stat	1.999618		

IMPORT PENETRATION

At Level

Null Hypothesis: IMPORT_PENETRATION has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.315089	0.0015
Test critical values:	1% level	-2.627238	
	5% level	-1.949856	
	10% level	-1.611469	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IMPORT_PENETRATION)
Method: Least Squares
Date: 04/17/21 Time: 10:24
Sample (adjusted): 1982 2019
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IMPORT_PENETRA	-	0.039362	-3.315089	0.0021

TION(-1)	0.130489		
		Mean dependent var	-2.107544
R-squared	0.185890		
		S.D. dependent var	9.032136
Adjusted R-squared	0.185890		
		Akaike info criterion	7.059758
S.E. of regression	8.149518		
		Schwarz criterion	7.102852
Sum squared resid	2457.342		
		Hannan-Quinn criter.	7.075091
Log likelihood	-133.1354		
Durbin-Watson stat	1.676255		

OUTPUT GROWTH

At Level

Null Hypothesis: OUTPUT_GROWTH has a unit root
Exogenous: None
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.937025	0.0514
Test critical values:	1% level	-2.628961	
	5% level	-1.950117	
	10% level	-1.611339	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(OUTPUT_GROWTH)
Method: Least Squares
Date: 04/17/21 Time: 10:27
Sample (adjusted): 1983 2019
Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OUTPUT_GROWTH(-1)	-0.224107	0.115697	-1.937025	0.0608
D(OUTPUT_GROWTH(-1))	-0.376444	0.145366	-2.589624	0.0139

R-squared	0.301227	Mean dependent var	0.189286
Adjusted R-squared	0.281262	S.D. dependent var	4.741107
S.E. of regression	4.019435	Akaike info criterion	5.672698
Sum squared resid	565.4550	Schwarz criterion	5.759775
Log likelihood	-102.9449	Hannan-Quinn criter.	5.703397
Durbin-Watson stat	1.868076		

At First Difference

Null Hypothesis: D(OUTPUT_GROWTH) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.24867	0.0000
Test critical values:	1% level	-2.628961	
	5% level	-1.950117	
	10% level	-1.611339	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(OUTPUT_GROWTH,2)

Method: Least Squares
Date: 04/17/21 Time: 10:28
Sample (adjusted): 1983 2019
Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OUTPUT_GROWTH(-1))	-1.465804	0.143024	-10.24867	0.0000

R-squared	0.744653	Mean dependent var	-0.154562
Adjusted R-squared	0.744653	S.D. dependent var	8.252690
S.E. of regression	4.170241	Akaike info criterion	5.720480
Sum squared resid	626.0728	Schwarz criterion	5.764018
Log likelihood	-104.8289	Hannan-Quinn criter.	5.735829
Durbin-Watson stat	1.924970		

INTEREST RATE

At Level

Null Hypothesis: INTEREST_RATE has a unit root
Exogenous: None
Lag Length: 2 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.071931	0.6993
Test critical values:	1% level	-2.630762	
	5% level	-1.950394	
	10% level	-1.611202	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INTEREST_RATE)
Method: Least Squares
Date: 04/17/21 Time: 10:29
Sample (adjusted): 1984 2019
Included observations: 36 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTEREST_RATE(-1)	0.002039	0.028346	0.071931	0.9431
D(INTEREST_RATE(-1))	-0.178498	0.172348	-1.035682	0.3079
D(INTEREST_RATE(-2))	-0.204257	0.171885	-1.188331	0.2432

R-squared	0.057848	Mean dependent var	0.205704
Adjusted R-squared	0.000748	S.D. dependent var	3.137728
S.E. of regression	3.136554	Akaike info criterion	5.203782
Sum squared resid	324.6531	Schwarz criterion	5.335742
Log likelihood	-90.66808	Hannan-Quinn criter.	5.249840
Durbin-Watson stat	1.857354		

At First Difference

Null Hypothesis: D(INTEREST_RATE) has a unit root
Exogenous: None
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.427890	0.0000
Test critical values:	1% level	-2.630762	
	5% level	-1.950394	
	10% level	-1.611202	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INTEREST_RATE,2)
Method: Least Squares
Date: 04/17/21 Time: 10:30
Sample (adjusted): 1984 2019
Included observations: 36 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INTEREST_RATE(-1))	-1.379220	0.254099	-5.427890	0.0000
D(INTEREST_RATE(-1),2)	0.202590	0.167806	1.207287	0.2357

R-squared	0.591162	Mean dependent var	-0.007440
Adjusted R-squared	0.579137	S.D. dependent var	4.763586
S.E. of regression	3.090327	Akaike info criterion	5.148383
Sum squared resid	324.7040	Schwarz criterion	5.236357
Log likelihood	-90.67090	Hannan-Quinn criter.	5.179088
Durbin-Watson stat	1.857893		

TRADE OPENNESS

At Level

Null Hypothesis: TRADE_OPPENESS has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.987989	0.0460
Test critical values:	1% level	-2.627238	
	5% level	-1.949856	
	10% level	-1.611469	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TRADE_OPPENESS)
Method: Least Squares
Date: 04/17/21 Time: 10:31
Sample (adjusted): 1982 2019
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TRADE_OPPENESS(-1)	-0.055337	0.027835	-1.987989	0.0543

		Mean dependent var	-1.498761
R-squared	0.069390		
Adjusted R-squared	0.069390	S.D. dependent var	8.767568
S.E. of regression	8.457908	Akaike info criterion	7.134044
Sum squared resid	2646.840	Schwarz criterion	7.177139

		- Hannan-Quinn	7.14937
Log likelihood	134.5468	criter.	7
Durbin-Watson stat	2.089760		

INFLATION

At Level

Null Hypothesis: INFLATION has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.881782	0.0578
Test critical values:	1% level	-2.627238	
	5% level	-1.949856	
	10% level	-1.611469	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INFLATION)
Method: Least Squares
Date: 04/17/21 Time: 10:34
Sample (adjusted): 1982 2019
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INFLATION(-1)	-0.171327	0.091045	-1.881782	0.0678

		Mean dependent var	-0.118456
R-squared	0.087289		

Adjusted R-squared	0.087289	S.D. dependent var	15.16393
S.E. of regression	14.48700	Akaike info criterion	8.210344
Sum squared resid	7765.310	Schwarz criterion	8.253439
Log likelihood	-154.9965	Hannan-Quinn criter.	8.225677
Durbin-Watson stat	1.733612		

At First Difference

Null Hypothesis: D(INFLATION) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.760887	0.0000
Test critical values:	1% level	-2.628961	
	5% level	-1.950117	
	10% level	-1.611339	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INFLATION,2)
Method: Least Squares
Date: 04/17/21 Time: 10:35
Sample (adjusted): 1983 2019
Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INFLATION(-	-	0.164756	-5.760887	0.0000

1))	0.949140		
R-squared	0.479521	Mean dependent var	0.360193
Adjusted R-squared	0.479521	S.D. dependent var	21.06515
S.E. of regression	15.19729	Akaike info criterion	8.306767
Sum squared resid	8314.479	Schwarz criterion	8.350305
Log likelihood	152.6752	Hannan-Quinn criter.	8.322116
Durbin-Watson stat	1.872873		

IMPORTS

At Level

Null Hypothesis: IMPORT has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.721303	0.0806
Test critical values:	1% level	-2.627238	
	5% level	-1.949856	
	10% level	-1.611469	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IMPORT)
Method: Least Squares
Date: 04/17/21 Time: 10:36
Sample (adjusted): 1982 2019

Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IMPORT(-1)	-0.069848	0.040579	-1.721303	0.0935

R-squared	0.061234	Mean dependent var	-2.24E+11
Adjusted R-squared	0.061234	S.D. dependent var	1.92E+12
S.E. of regression	1.86E+12	Akaike info criterion	59.36960
Sum squared resid	1.28E+26	Schwarz criterion	59.41269
Log likelihood	-1127.022	Hannan-Quinn criter.	59.38493
Durbin-Watson stat	1.583251		

At First Difference

Null Hypothesis: D(IMPORT) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.318812	0.0000
Test critical values:	1% level	-2.628961	
	5% level	-1.950117	
	10% level	-1.611339	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IMPORT,2)
Method: Least Squares
Date: 04/17/21 Time: 10:38
Sample (adjusted): 1983 2019
Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IMPORT(-1))	-0.833134	0.156639	-5.318812	0.0000

R-squared	0.439157	Mean dependent var	9.62E+10
Adjusted R-squared	0.439157	S.D. dependent var	2.46E+12
S.E. of regression	1.84E+12	Akaike info criterion	59.35060
Sum squared resid	1.22E+26	Schwarz criterion	59.39414
Log likelihood	-1096.986	Hannan-Quinn criter.	59.36595
Durbin-Watson stat	2.093620		

REGRESSION RESULT

Dependent Variable: LOGMANUFACTURING_OUTPUT
Method: Least Squares
Date: 05/04/21 Time: 16:20
Sample: 1981 2019
Included observations: 39

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGIMPORT_PENE	0.904864	0.119335	7.582572	0.0000

TRATION				
LOGIMPORT	-0.744301	0.050094	-14.85821	0.0000
OUTPUT_GROWTH	-0.019763	0.005147	-3.839691	0.0005
LOGINTEREST_RATE	0.054805	0.092800	0.590572	0.5590
LOGTRADE_OPENESS	-0.770913	0.297006	-2.595619	0.0141
LOGINFLATION	-0.022212	0.035681	-0.622514	0.5380
C	24.46498	1.428565	17.12557	0.0000

R-squared	0.927483	Mean dependent var	2.584307
Adjusted R-squared	0.913887	S.D. dependent var	0.396912
S.E. of regression	0.116474	Akaike info criterion	-1.301149
Sum squared resid	0.434118	Schwarz criterion	-1.002561
Log likelihood	32.37240	Hannan-Quinn criter.	-1.194018
F-statistic	68.21315	Durbin-Watson stat	1.375669
Prob(F-statistic)	0.000000		

2 STEP ENGEL-GRANGER COINTEGRATION TEST

Null Hypothesis: ECT has a unit root
Exogenous: None
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*

Augmented Dickey-Fuller test statistic		-4.525397	0.0000
Test critical values:	1% level	-2.628961	
	5% level	-1.950117	
	10% level	-1.611339	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ECT)
Method: Least Squares
Date: 05/04/21 Time: 16:25
Sample (adjusted): 1983 2019
Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT(-1)	-0.875385	0.193438	-4.525397	0.0001
D(ECT(-1))	0.197015	0.160536	1.227234	0.2279

R-squared	0.400959	Mean dependent var	-0.001986
Adjusted R-squared	0.383844	S.D. dependent var	0.128622
S.E. of regression	0.100963	Akaike info criterion	-1.695589
Sum squared resid	0.356773	Schwarz criterion	-1.608512
Log likelihood	33.36839	Hannan-Quinn criter.	-1.664890
Durbin-Watson stat	1.927210		

SHORT-RUN ERROR CORRECTION MODEL

Dependent Variable: D(LOGMANUFACTURING_OUTPUT)
Method: Least Squares
Date: 05/04/21 Time: 16:29
Sample (adjusted): 1982 2019
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGIMPORT_PENETRATION)	0.451858	0.340805	1.325854	0.1949
D(LOGIMPORT)	-0.238993	0.233871	-1.021899	0.3150
D(OUTPUT_GROWTH)	-0.009319	0.004099	-2.273355	0.0303
D(LOGINTEREST_RATE)	-0.162151	0.107163	-1.513117	0.1407
D(LOGTRADE_OPENESS)	-0.502870	0.282973	-1.777099	0.0857
D(LOGINFLATION)	-0.017420	0.023970	-0.726765	0.4730
ECT(-1)	-0.405106	0.157927	-2.565150	0.0156
C	-0.009304	0.015913	-0.584670	0.5631

R-squared	0.309775	Mean dependent var	-0.022170
Adjusted R-squared	0.148722	S.D. dependent var	0.091773
S.E. of regression	0.084674	Akaike info criterion	-1.915351
Sum squared resid	0.215091	Schwarz criterion	-1.570591

			6
			-
		Hannan-Quinn	1.79269
Log likelihood	44.39167	criter.	0
		Durbin-Watson	1.83225
F-statistic	1.923438	stat	1
Prob(F-statistic)	0.100593		

ERROR TERM/RESIDUAL DIAGNOSTICS TESTS

SERIAL CORRELATION TEST

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.267936	Prob. F(2,30)	0.1210
Obs*R-squared	5.122182	Prob. Chi-Square(2)	0.0772

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 05/04/21 Time: 16:43
Sample: 1981 2019
Included observations: 39
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGIMPORT_PENETRATION	-0.030975	0.116153	-0.266671	0.7915
LOGIMPORT	-0.004918	0.048644	-0.101111	0.9201
OUTPUT_GROWTH	0.003618	0.005830	0.620575	0.5396
LOGINTEREST_RATE	-0.025301	0.095595	-0.264666	0.7931
LOGTRADE_OPENESS	0.085662	0.289366	0.296032	0.7692

LOGINFLATION	0.012218	0.036173	0.337752	0.7379
C	-0.055930	1.385134	-0.040379	0.9681
RESID(-1)	0.395561	0.195938	2.018805	0.0525
RESID(-2)	-0.175002	0.188793	-0.926954	0.3613

R-squared	0.131338	Mean dependent var	-4.92E-15
Adjusted R-squared	-0.100305	S.D. dependent var	0.106884
S.E. of regression	0.112116	Akaike info criterion	-1.339386
Sum squared resid	0.377102	Schwarz criterion	-0.955487
Log likelihood	35.11802	Hannan-Quinn criter.	-1.201646
F-statistic	0.566984	Durbin-Watson stat	1.891288
Prob(F-statistic)	0.796210		

HETEROSKEDASTICITY TEST

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.965481	Prob. F(6,32)	0.4640
Obs*R-squared	5.977911	Prob. Chi-Square(6)	0.4257
Scaled explained SS	2.574625	Prob. Chi-Square(6)	0.8600

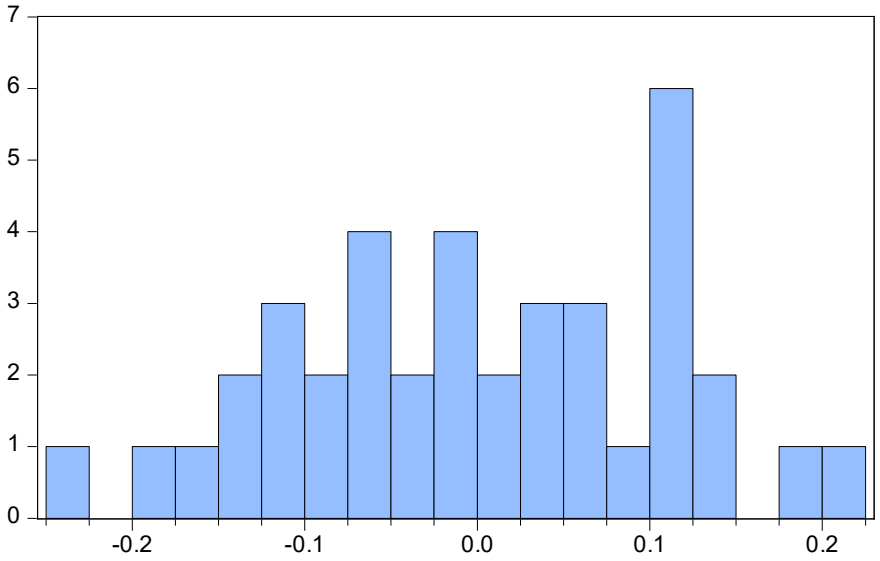
Test Equation:
Dependent Variable: RESID^2
Method: Least Squares

Date: 05/04/21 Time: 16:40
Sample: 1981 2019
Included observations: 39

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.118725	0.156875	0.756813	0.4547
LOGIMPORT_PENETRATION	0.005590	0.013104	0.426571	0.6725
LOGIMPORT	-0.000845	0.005501	-0.153578	0.8789
OUTPUT_GROWTH	0.000388	0.000565	0.685688	0.4978
LOGINTEREST_RATE	-0.018168	0.010191	-1.782772	0.0841
LOGTRADE_OPENESS	-0.012010	0.032615	-0.368234	0.7151
LOGINFLATION	-0.001617	0.003918	-0.412752	0.6825

R-squared	0.153280	Mean dependent var	0.011131
Adjusted R-squared	-0.005480	S.D. dependent var	0.012755
S.E. of regression	0.012790	Akaike info criterion	-5.719102
Sum squared resid	0.005235	Schwarz criterion	-5.420514
Log likelihood	118.5225	Hannan-Quinn criter.	-5.611971
F-statistic	0.965481	Durbin-Watson stat	1.954921
Prob(F-statistic)	0.463996		

NORMALITY TEST



Series: Residuals	
Sample 1981 2019	
Observations 39	
Mean	-4.92e-15
Median	-0.011815
Maximum	0.202234
Minimum	-0.234685
Std. Dev.	0.106884
Skewness	-0.168182
Kurtosis	2.279451
Jarque-Bera	1.027538
Probability	0.598237

CUSUM TEST FOR STABILITY