MPRI-JAIMR | INTERNATIONAL JOURNAL OF AFRICAN INNOVATION & MULTIDSCIPLINARY RES.
VOL. 1 NO. 1 JUN-2022

STABILIZATION POLICIES, INFRASTRUCTURAL DEVELOPMENT AND INDUSTRIALIZATION PROCESS IN NIGERIA

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Abstract

This study set out to investigate the relationship between stabilization policies, infrastructural development and industrialization process in Nigeria. The study estimated a slightly modified form of the basic St. Louis equation with data ranging from 1981 to 2015. The main finding is that increase in electricity, gas and water infrastructure would facilitate industrialization process in Nigeria. The Johansen co-integration testing approach demonstrates a significant long-run relationship between these three variables. The study found that government revenue (fiscal policy) communication infrastructure, and electricity, gas and water infrastructure have significant effect on the development of crude petroleum and natural gas. The study on solid mineral sector suggests that interest rate (monetary policy) has a significant inverse relationship with the development of solid minerals. Again, the study found that all the infrastructural variables have significant effect on solid mineral development. The result on manufacturing sector suggests that interest rate (monetary policy) has a significant inverse effect on manufacturing sector development. This implies that a decrease in interest rate would spur growth in the manufacturing sector. Also, the result found that transportation infrastructure plays a

KEYWORDS:
Stabilization Policy, Infrastructural Development, Industrialization, Electricity, Infrastructure, Communication and Solid Minerals

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significant role in the development of the manufacturing sector. At lag 2, result shows that a change in the index of industrial production would cause a change in broad money supply and transportation infrastructure. The study concludes that, with strong determination and positive actions we will surmount our industrialization challenges.

Introduction

For a nation to industrialize and develop, it must have an efficient stabilization policy (hereafter, monetary and fiscal policies) and infrastructure on ground. Nigeria is great not just because it is the seventh most populous country on the planet. It is an important nation not only on account of her oil wealth. It is significant more because of the energy of her people, whose creativity and resilient spirit of enterprise continues to assure her progress even in the face of seemingly hopeless situations. It is due to the hard-work and industry of the ordinary Nigerians- (the nation's greatest asset), that Nigeria attained a GDP rebased at $510 billion in 2013 exceeding that of South Africa to become the biggest African economy even in the face of her parlous infrastructure. The feat is the result of the toiling of small scale entrepreneurs, who continue to create value without adequate electricity, cottage food processors, without affordable financing, farmers without the scantest of state support; artisans, bold and imaginative business men and women, dynamic financial managers, young innovators creative artistes and hardworking professionals (Gbenga, 2015).

Since Nigeria became independent in 1960, achieving economic development through rapid industrialization has remained a major challenge. How to achieve rapid economic development has also remained the primary focus of succeeding administrations in the country. Thus, different economic development policies (with each having a bearing on the industrial sector) were adopted ranging from Import Substitution Strategy (ISS) through indigenization to the Structural Adjustment Program (SAP). However, it seemed as if none of these policies provided sufficient answers to the challenges of the country's industries to the point that many have concluded that the more new policies were introduced, the farther the country moved away from being industrialized (Iwuagwu, 2011).

The Nigerian economy has been plagued with several challenges over the years. In spite of many, and frequently changing, fiscal, monetary and other macro-economic policies, Nigeria has not been able to harness her economic potentials for rapid economic development (Ogbole, 2010). According to Adeoye (2006), the

debate on the effectiveness of fiscal policy as a tool for promoting growth and development remains inconclusive, given the conflicting results of current studies (Abata, Kehinde & Bolarinwa, 2012).

Onwe, (2014) in (Ubesie, 2016) posits that "the role of fiscal policies in the development of emerging economies has been a major source of concern in economic literature. Majority of studies in this area have however, concentrated on the industrialized countries of the Western World, with little or no reference to the emerging economies of the developing countries". According to (Agu, Idike, Okwor, & Ugwunta, 2014) a review of Nigeria's macroeconomic indices shows that inflation has accelerated to double-digit levels (from 6.94 in 2000 to 18.87 in 2001), (IMF, 2001). This double digit inflation continued up to 2005, and decreases to single digit in 2006 and 2007. In 2008 the inflation rate reverted to double digit - 11.58 and continued to increase and in 2010 it was 13.72% (IMF, 2011).

Per capita income in Nigeria has been increasing steadily from year 2000 when it was N39,657 to

N71,131 in year 2010, (IMF, 2011). This increase in per capita income has not led to an increase in the standard of living of the citizens because of increasing cost of goods and services. The country's debt profile is also steadily increasing. According to (Nwankwo, 2010), Nigeria debt profile was $32.5billion as at September 2010, i.e. N5,241,667m as at September 2010. In year 2000, the total outstanding debt of Nigeria was N3,995,638m. There continued to be an upward trend until in 2006 when it came down to (N3,177,409m) because of debt cancellation agreement between Nigeria and Paris Club (Okwo, 2010). Thereafter, it started rising again and reached N5,241,667m in 2010.

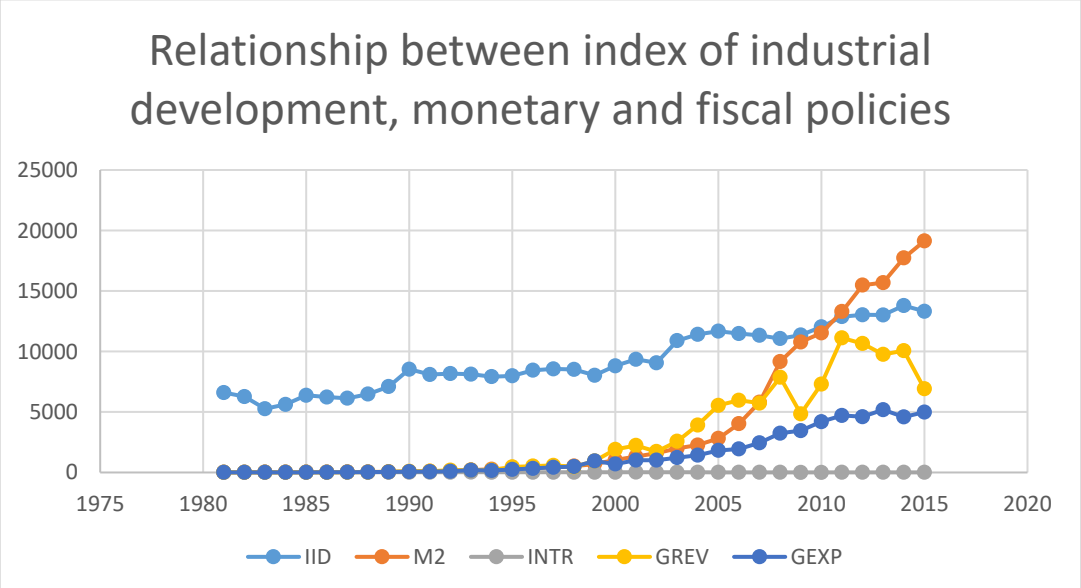


Figure 1. Relationship between index of industrial development, monetary and fiscal policies

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The figure suggests that monetary and fiscal policies have not been moving in the direction that would spur industrialization.

The expenditure pattern of Nigeria has been on the increase. In 2000, the total expenditure was N701,059m. It has increased steadily and in 2010 it was N4,199,429m. Generally, increase in expenditure should lead to reduced unemployment rate but in Nigeria the reverse is the case i.e.

as total expenditure increases, rate of unemployment increases. This is because a greater percentage of the total expenditure is channeled to recurrent expenditure and the proportion is worsening. In 2000, the percentage of the total expenditure spent on recurrent was 66% and has increased to 79% in 2010. The implication is that less percentage of the total expenditure is spent on capital project which creates job in the economy. One of the major issues raised against Nigeria's 2012 budget is the high rate of recurrent expenditure. Based on the budget, government proposed spending most of its money on running the administration rather than in the badly needed infrastructure projects to create jobs and boost growth in the continent's second largest econ

(Olajide, & Adekoya, (2012).

Today, monetary and fiscal policies are both commonly accorded prominent roles in the pursuit of macroeconomic stabilization in developing countries especially in Nigeria, but the relative importance of these policies has been a serious debate between the Keynesians and the monetarists.

In the last three decades, since independence, Nigeria has pursued industrialisation with the hope to transform the economy from a monolithic, inefficient and import-dependent economy to a more dynamic and export-oriented economy, especially exports of industrial goods. These aspirations as contained in the successive development plans (especially, first and second development plans) of the Federal Government were further reinforced by the windfall gains from crude oil boom of the 1972/73 and 1979/80 periods. However, despite series of deregulation policies introduced since 1986 by successive governments to facilitate industrialisation process in an economically conducive manufacturing environment, the performance of the industrial sector remains undesirable. In the last two decades, Nigeria recorded an unremarkable economic performance especially in manufacturing industry in the areas of production and international trade. Besides, its poor macroeconomic management might have largely contributed to such unfavourable performance of the industrial (manufacturing) sector. Regardless of the numerous constraints facing the

industrial sector, the country still has some hope in the sector in propelling the necessary economic diversification from risk and uncertainty of the mining sector (Adeoye, 2005).

Between the end of 2006 and the first half of 2017, Nigeria's industrial sector could be said to have passed through its most difficult period since independence. During this period, the sector grappled with numerous challenges including low capacity utilization resulting from: unstable infrastructure (especially poor power supply, bad roads etc), which impacted negatively on cost of doing business; absence of venture capital especially for business start-ups; high cost of capital from banks and other financial institutions; lack of long term loans; poor macroeconomic environment (including inadequate regulation and lack of business incentives); multiple taxation, etc. All these combined to bring industry's contribution to National GDP to just a little over 4%. Expectedly, some manufacturing companies even shut down, while others migrated to neighboring countries where the business environment was considered friendlier (Iwuagwu, 2011).

The current dwindling in the industrial sector and seemingly collapse in the entire socio economic infrastructures of the Nigerian economy has made several scholars to tag the country a sick nation. The Nigerian manufacturing sector is sick. The productive sector is in a crisis as its average contribution to the nation's Gross Domestic Product over the past few years has not gone beyond 5%. Many years of neglect and maladministration on the part of successive military and civilian governments, coupled with corruption and indiscriminate policy reversals have all conspired to render the industrial sector comatose.

Of course, economic growth and development do not take place in a vacuum. A virile economy presupposes the existence of a virile infrastructure. Infrastructure has been defined as the basic structures and facilities necessary for a country or an organization to function efficiently, e.g. buildings, transport, water and energy resources, and administrative systems (Honby, 1995). In general terms, it refers to the economic and social facilities which are provided by the government, or by private sector operators, for the social and economic development of the individual and the society at large.

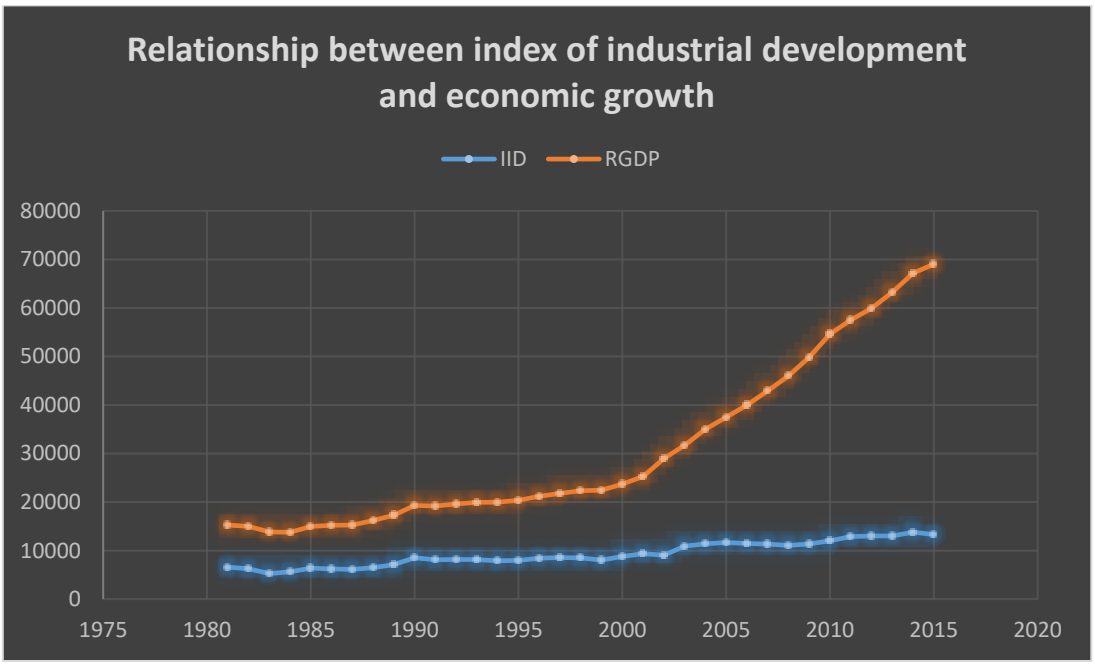


Figure 2: Relationship between index of industrial development and economic growth

Figure 2 shows a divergent movement between industrial development and economic growth.

As a rough typology, a distinction may be drawn between physical infrastructure (such as roads, dams, canals and railways) and public utilities (such as electricity, potable water, sanitation and sewage), and between economic and social infrastructure. While the aforementioned facilities can pass for economic infrastructure, health and educational facilities, such as hospitals and schools, constitute social infrastructure. However, the three facilities to be considered - water supply, electricity and transportation - combine elements of economic and social infrastructure. These facilities would be expected to have a significant effect on industrialization process, or ameliorate the lives of Nigerians. Now, the question is, what is the magnitude of the contribution of Stabilization policies and infrastructure on industrialization process in Nigeria? Thus, this study would be saddled with the responsibility of unravelling this question.

The participation of new Independent Power Producers (IPPs) in the sector are specially very crucial because whilst privatization of existing utilities merely transfers ownership to the new operators, it is the new greenfield IPPs that add capacity to the network. Unfortunately, in the past five years no new IPP has been commissioned in Nigeria. As a matter of fact last year no single turbine was

imported to Nigeria and none has been imported this year, compared to 15 GE turbines that were shipped to Egypt this year alone. Ten years running, this reform has been hampered by the difficulties associated with the private sector participation in infrastructure development identified previously. The difference here is, the sense of urgency that the resolution of these issues in the power sector demands. They are questions to which answers cannot be delayed further; they must be addressed right now! Policy formulators only lament and sing the power inadequacy like a song and failing to take the practical executive actions that do not even require legislation to achieve. As an operator in this sector, I have outlined some immediate steps to be taken to recalibrate the power sector reform. As a matter of fact, the country has not witnessed the construction of any new green field port over the last four decades despite a rapidly expanding economy. According to the AFDP 2013 study, of all the freight that arrived Nigerian port, only 0.2% throughput travelled by rail. The oil refineries are in an incredibly bad shape. Nigeria, the 5th largest producer of oil has turned into a net importer of petroleum products due to the shameful state of gas and pipeline infrastructure. Hospitals and Educational facilities are in a state of decay crippled by the manacles of poor maintenance and underdevelopment. The reasons for the infrastructure decay are not far-fetched. They include; lack of adequate investment from both the public and the private sector, lack of adequate maintenance programme and capacity building issues. In order to upgrade the nation's infrastructure for the purpose of supporting the desired economic growth target and socioeconomic development objectives, the AFDP forecasts Nigeria requires $350 billion USD CAPEX investment over a period of nine years. It also estimates that $100billion USD is required over the same period as OPEX investment. A recent McKinsey projection on the cost of upgrading Nigeria infrastructure is not too far from the AFDP assumptions. McKinsey projects that $31 billion USD is required annually over a period of ten years. Both studies expect most of CAPEX investments to come principally from Federal Government Infrastructure Funding commitment, Public-Private Sector collaboration through the PPP and direct private sector investment. Unfortunately, the funding commitment from the Federal Government to infrastructure has been disappointing as only a meagre $3.6 billion USD commitment to Capital Expenditure was provided for in the 2014 budget. Private sector commitment has also been small and slow in coming.

The task of building a resilient infrastructure that will meet the developmental needs of the country are many but the study will limit itself to five critical areas as it assumes that policy makers will be more interested in how to scale the hurdles than an exhaustive list of the problems. For our purpose the study has identified; (i). Funding (ii). Administrative and Bureaucratic impediments to private sector participation in infrastructure development (iii). Man-Power challenges (iv). Lack of industrial base to locally produce the component of infrastructural facilities (v). Re-calibrating the Electricity Sector Reform.

Consequent upon the foregoing, the major research issues to be addressed in this study include:

1. Has Nigeria created efficient stabilization policies for efficient resource allocation in order to promote industrialization in the neighbourhood of economic liberalisation and deregulation paradigms?
2. To what extent has Nigeria restructured her infrastructural systems for effective industrialization within the on-going diversification process?

This paper therefore attempts to examine stabilization policies, infrastructural development and industrialization process in Nigeria between 1981 and 2016. In examining the history of infrastructure policies, this work also focuses on water supply, electricity and transport. It sheds light on the differential and complementary roles of government and private sector operators, and especially on recent trends indicating a steady retreat of the state from the provision of urban infrastructure. This work combines the chronological and thematic approaches to capture the highlights of the general and sectoral changes in Nigeria.

Review of Relevant Literature

Conceptual Framework

Fiscal Policy

The term fiscal policy has conventionally been associated with the use of taxation and public expenditure to influence the level of economic activities. The implementation of fiscal policy is essentially routed through government's budget. The budget is, therefore, more than a plan for administering the government sector. It (budget) both reflects and shapes a country's economic life. In fact, the most important aspect of a public budget is its use as a tool in the management of a nation's economy (Omitogun and Ayinla, 2007).

Fiscal policy deals with government deliberate actions in spending money and levying taxes with a view to influencing macro-economic variables in a desired direction. This includes sustainable economic growth, high employment creation and low inflation (Microsoft Corporation, 2004). Thus, fiscal policy aims at stabilizing the economy. Increases in government spending or a reduction in taxes tend to pull the economy out of a recession; while reduced spending or increased taxes slow down a boom (Dornbusch and Fischer, 1990).

Fiscal policy involves the use of government spending, taxation and borrowing to influence the pattern of economic activities and also the level and growth of aggregate demand, output and employment. Fiscal policy entails government's management of the economy through the manipulation of its income and spending power to achieve certain desired macroeconomic objectives (goals) amongst which is economic growth (Medee and Nembee, 2011). Olawunmi and Tajudeen (2007) opine that fiscal policy has conventionally been associated with the use of taxation and public expenditure to influence the level of economic activities. They further said the implementation of fiscal policy is essentially routed through government's budget. Fiscal policy as mostly to achieve macroeconomic policy; it is to reconcile the changes which government modifies in taxation and expenditure, programmes or to regulate the full employment price and total demand to be used through instruments such as government expenditures, taxation and debt management (Hottz-Eakin, Lovely and Tosin, 2009). As noted by Anyanwu (1993), the objective of fiscal policy is to promote economic conditions conducive to business growth while ensuring that any such government actions are consistent with economic stability.

Monetary Policy

Monetary policy is concerned with discretionary control of money supply by the monetary authorities (Central Bank with Central Government) in other to achieve stated or desired economic goals. Governments try to control the money supply because most governments believe that its rate of growth has an effect on the rate of inflation. Hence monetary policy comprises those government actions designed to influence the behaviour of the monetary sector.

Monetary Policy is the deliberate use of monetary instruments (direct and indirect) at the disposal of monetary authorities such as central bank in order to achieve macroeconomic stability. Monetary Policy is essentially the tool for executing the mandate of monetary and price stability. Monetary policy is

essentially a programme of action undertaken by the monetary authorities generally the central bank, to control and regulate the supply of money with the public and the flow of credit with a view to achieving predetermined macroeconomic goals (Dwivedi, 2005).

Infrastructure

The word 'infrastructure' connotes different meaning to different people. Infrastructure, most generally, is the set of interconnected structural element that provide the framework for supporting the entire structure. It usually applies only to structures that are artificial. The term is used differently in a variety of fields; perhaps the single most well-known usage is in economics, where it refers to physical infrastructure such as buildings and roads (Adewoye, and Momoh, 2006). The term is used most often in an urban planning context to denote the facilities that support specific land uses and built environment. Typically, infrastructure in the urban context denotes two general groups of support systems: transportation modalities (roads, rail, etc.) and utilities. These typically compose both public and private systems, and some ambiguously held in common.

Infrastructure may also refer to necessary municipal or public services, whether provided by the government or by private companies. If provided by nature, e.g. the flow of a river, they are called nature's services and are defined (at least in economics) as the product of natural capital. This may be augmented or directed by infrastructural capital, e.g. a dam or canal or irrigation ditch. In general what is called infrastructure tends to be much embedded in the natural landscape and cannot be moved from place to place. Even municipal services rely necessarily on fixed locations, e.g. fire stations in central positions in a city, radio towers on tall buildings, etc.

Infrastructure (in the civic sense) includes: transport (roads, highways, railroads, public transport. airports, ship transport such as ferry and barge, bike paths, sidewalks, greenways); public utilities (electricity, natural gas, coal delivery, water supply, sewers, telephone service, radio and television broadcasts); public services (fire service or fire department, flood protection, police protection, waste management); national services (defense, monetary systems or currency, including the minting of coins, and printing and backing of banknotes, postal system, frequency allocation, i.e., electromagnetic spectrum management for broadcasts (terrestrial and satellite).

'Soft Infrastructure' is a term that denotes institutions that maintain the health and cultural standards of the population. Principally, this refers to public education, public health systems including public hospitals, public libraries, social welfare.

In short, **'infrastructure'** refers generally to those manpower and physical structures and installations which a country establishes for the purpose of facilitating its agricultural, industrial and commercial production, rendering social services and maintaining the security of the community. These include transportation infrastructure, manufacturing infrastructure, communication facilities, utilities supply, housing, power, education and healthcare facilities, firefighting systems, systems for the maintenance of law and order, etc.

Industrialisation

Industrialisation has been seen as a veritable channel of attaining the lofty and desirable conception and goals of improved quality of life for the populace. This is because, industrial development involves extensive technology-based development of the productive (manufacturing) system of the economy. In other words, it could be seen as a deliberate and sustained application and combination of suitable technology, management techniques and other resources to move the economy from the traditional low level of production to a more automated and efficient system of mass production of goods and services (Ayodele and Falokun, 2003).

Theoretical Evidences

Different opinions have indeed continued to emerge on how fiscal policy can affect economic activities. The genesis of these controversies has been traced to the theoretical exposition of the different schools of thought namely: the Classical; the Keynesian; and the Neo-classical schools of thought. To the Classical school of thought, fiscal deficits incessantly financed by debt crowds-out private investment and by extension lowering the level of economic growth. As summarized by Tchokote (2001), the classical economists believe that debt issued by the public has no effect on the private sector savings. To them, a deficit financed by increasing the supply of securities, ceteris paribus reduces its price and raises real interest rates and this crowds out private investment. In sum, excessive deficit can lead to poor economic performance.

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As observed by Omitogun and Ayinla (2007), the Keynesian school of thought postulates a positive relationship between deficit financing and investment and consequently on economic growth. This school of thought sees fiscal policy as a tool of overcoming fluctuations in the economy. As put by Tchokote (2001) this school regards deficit financing as an important tool to achieve a level of aggregate demand consistent with full employment. When debt is used to finance government expenditures, consumers' income will be increased. Given that resources are not fully utilized, crowding-out of private investment by high interest rates would not occur. The position of the Keynesian school of thought on the possible effects of fiscal deficits on economic activities has been challenged by the Neo-classical school of thought on the premise that the former school ignores the significance of how fiscal deficits are financed on the effect of this policy variable on macroeconomic performance. The Neoclassical school postulates that the manner in which deficits are financed is capable of influencing the level of consumption and investment and by extension affect economic growth.

In Nigeria, the result of government role in economic activities and the achievements in economic performance in Nigeria have been mixed. The economy experienced growth in real output in some years and declines in others. But the overall picture is low scoring for the country's development efforts. The economic crisis from the 1980s and early 1990s brought out vividly the distinction between growth and development. The objectives of monetary and fiscal policies in Nigeria are wide-ranging These include increase in Gross Domestic Product growth rate, reduction in the rates of inflation and unemployment, improvement in the balance of payments, accumulation of financial savings and external reserves as well as stability in Naira exchange rate The policy as well as instruments applied to attain these objectives, however, have until recently been far from adequate undue reliance has been placed on fiscal policy rather than monetary policy in Nigeria (Darrat, 1984).

State of Infrastructure

Power

The first generation plant was established in 1898 at Lagos to serve the colonial administration. This was followed with several isolated power stations to which various towns in the federation tied to their loads. The creation of Electricity Corporation of Nigeria, ECN, in 1950 brought about strategic programmes at

establishing a power industry which is sound, operational, reliable and flexible to manage. The Niger Dams Authority, NDA, was established in 1962 and by 1968 the government built and commissioned the Kanji Hydro Station. The ECN built more generating stations (thermal and hydro) and transmission lines to link the generating stations in a grid system to towns and cities. In 1973 ECN and NDA were merged to form the National Electric Power Authority, NEPA, and up till now they are still responsible for the generation and distribution of electricity (Sagaya, 2006).

Before the reform of the Nigeria electricity sector, there were eight power stations including the moribund Afam Power Stations with an installed capacity of 5,920 MW. The available capacity of less than 3,000 MW and the demand for power of 9,700 MW means that most Nigerians will continue to go on without electricity.

The reform in the electricity sector has opened up the sector and this has encouraged the participation of the private sector in the generation and distribution of power. The independent power producers are now building power stations; some have been commissioned while the others are in various stages of completion. Government however did not leave everything in the hands of the private investors as it has embarked on building of power stations which on completion will boost the power available for distribution. It is unfortunate that all the billions of Naira that have been sun ked in NEPA have not been able to guarantee Nigerians near regular supply of power. Part of the problems can be traced to lack of basic infrastructure and maintenance culture.

Transportation infrastructure

Transportation is a very vital infrastructure needed for the growth of the economy. The ease with which people and raw materials move from one part of a country to the other speaks volume about the economy of that country.

Even though there are different types of transportations like rail, water, air and pipeline, much emphasis is on transportation by road. Just like other infrastructures that depend heavily on proper government planning and the state of technology, the state of transportation infrastructure in the country has been in a state of neglect and this has impacted negatively on the state of development of the economy. Some of these types of transportation and their states in the country are:

Land transportation

Land transportation consists of roads, vehicles and motor parks among others. Of all these constituent components, the most important is the road. This is because road transport consists of about 95% of all surface transport in Nigeria today with total national assets (200,000 km of federal, states and local government roads) of over three trillion naira. Despite these huge assets, the annual budget allocation for maintenance and the importance of the roads to the land transport, only less than 27% of the road network in Nigeria is in good condition (Ezekwe, 1992). The state of the roads in Nigeria is bad and is becoming embarrassing to all stakeholders. This challenged the Nigerian Society of Engineers (NSE) and the Federal Ministry of Works to organize a workshop on 'Making Nigerian Roads Motorable' at the Hilton in Abuja on the 13th January, 2006. In that workshop, recommendations were made that the private sector be included in the building and maintenance of the roads, toll gates be reintroduced, road funds should be established and road management institute be established amongst others.

Air transport

Towards the end of the year 2005, Nigeria suffered three unfortunate air disasters. The Belview Airline that crashed in Lisa Village claimed over 100 lives and for the Sosoliso Airline that crashed in Port Harcourt, over 50 school children were amongst the passengers. There was also an incident in Kaduna where all the crew and passengers on the plane died. Beside the three accidents of that year, there were also several other incidences of aircraft veering off the runway on landing or overshooting the runway or aircraft running into cattles or birds on landing. Nearly all the accidents and incidences that occurred in the aviation industry in Nigeria are attributable to the very old aircrafts in the fleet of the operation and the obsolete navigational and 'landing equipment and the compromising attitude of some the personnel in the aviation monitoring and enforcing agencies. The accidents have brought the issue of the dilapidated and obsolete navigational equipment to the front runner. The findings of the commission of enquiry into the activities of the aviation industry revealed the rot in the industry and government is going all out to correct the ro~. The old aircrafts in the fleet of airline companies are being changed and the equipment and facilities are being updated.

Transportation by rail

Transportation by rail was the traditional method of transportation during the colonial era and the period immediately proceeding 1960. Even though the rail-

track of narrow gauge-meant for transportation of raw materials from the hinterlands to the ports for export, but with proper maintenance it was also used for moving people and goods from one part of the country to the other during the colonial era and after. The rail as it is now is in a sorry state. There is hardly anything functional with the rail-system under the Nigerian Railways that is now moribund. Corruption and mismanagement that was the hallmark of the period between 1980 and 1999 saw to the death of the rail-system in Nigeria. The rail-system can be revitalized and wider rail tracks laid in new places in addition to introducing electric train to make transportation by rail more efficient and reduce the pressure on our roads and by implication reduce accident rate on our roads.

Pipeline transportation

Pipeline transportation became popular after the discovery of oil in Nigeria. Pipeline transportation is mainly for transporting oil in the country, but there are countries where pipes are used for transporting gases to homes and industries just like water pipes. The use of pipe for transportation in the nation is still underutilized. The problem of pipe vandalization is a major battle that is being fought in recent times.

Water

The relevance of water as an infrastructure cannot be over-emphasized. The relevance is more felt in the industries where water is used for production; in fire-fighting services; and at home for cooking, drinking and other domestic uses. According to World Bank, Nigeria's total water resource available/capital (m^3) including water flow from other countries is 2,260 m^3 and the annual use as the percentage of the total is 1.4 (1980-2000).

This shows an under exploitation, operation, control and management of the abundant water resource. Water supply especially from the public mains has been unreliable over the years. It is even worse in the villages where people have resorted to unclean water for domestic uses and other applications. In the towns where there are more concentration of industries, the problem is usually that of exploitation and efficient distribution of water to places where they are needed. Some of the problems affecting the generation and distribution of water are:

i. Lack of enough resources to change ageing water generation and distribution equipment.

ii. Shortage of dedicated, efficient and properly trained manpower to man this equipment.
iii. Misappropriation and in some cases outright embezzlement of funds meant for the maintenance of the few available equipment.
iv. Indiscriminate digging of ground for construction purposes that in most cases leads to destruction of water distribution of pipes.
The availability of adequate water resources in the country shows that opportunity abounds if the resource is well utilized. To ensure proper utilization of water resources and management of the available water resources to meet industrial and domestic uses, there is need for privatization of the generation and supply of water resources.
This is to ensure efficiency and judicious utilization of funds meant to see to the growth of the supply and generation system.

Empirical Evidences

Fiscal and monetary policies

Over the last decade, the growth impact of fiscal policy has generated large volume of both theoretical and empirical literature. However, most of these studies paid more attention to developed economies and the inclusion of developing countries in case of cross-country studies were mainly to generate enough degrees of freedom in the course of statistical analysis (Aregbeyen, 2007). Fiscal and monetary policies are inextricably linked in macro-economic management; developments in one sector directly affect developments in the other. Undoubtedly, fiscal policy is central to the health of any economy, as government's power to tax and to spend affects the disposable income of citizens and corporations, as well as the general business climate.
Monetarist strongly believes that monetary policy exact greater impact on economic activity as unanticipated change in the stock of money affects output and growth i.e., the stock of money must increase unexpectedly for central bank to promote economic growth. In fact, they are of opinion that an increase in government spending would crowd out private sector and such can outweigh any short-term benefits of an expansionary fiscal policy (Abata, Kehinde, & Bolarinwa, 2012). On the other hand, the concept of liquidity trap which is a situation in which real interest rates cannot be reduced by any action of the monetary authorities was introduced by Keynesian economics. Hence, at liquidity trap an increase in the money supply would not stimulate economic growth because of the downward

pressure of investment owing to insensitivity of interest rate to money supply. John Maynard Keynes recommends fiscal policy by stimulating aggregate demand in order to curtail unemployment and reducing it in order to control inflation. While there are several studies on this debates between Keynesian and Monetarist in the developed countries, only fragmented evidence have been provided on this issues in the case of Nigeria policy (Abata, et al, 2012).

Fiscal policy aims at stabilizing the economy (Amadi, & Essi, 2006). Increases in government spending or a reduction in taxes tend to pull the economy out of a recession; while reduced spending or increased taxes slow down a boom (Dornbusch & Fischer, 1990).

Government interventions in economic activities are basically in the form of controls of selected areas/sectors of the economy. These controls differ, and depend on the specific needs or purpose the government desires to achieve. Samuelson, & Nordhaus, (1998), distinguished between two forms of regulation, namely:

(i). Economic regulation (involving control of prices, entry and exit conditions, regulation of public utilities such as transportation and media organizations, regulation of the financial sector operations.

(ii). Social regulation (aimed at protecting the health and safety of workers at work place, the environment, and protection of consumer rights. our focus is on economic regulation.

Proponents of government expansion are of the view that government expenditures provide valuable public goods including: education, roads, infrastructure, and security, among others (Mitchell, 2005). They claim that increases in government spending are capable of enhancing growth through, perhaps, rises in purchasing power of the citizenry, both in the short- and long-run (Samson, 2013).

Proponents of minimal government spending, however, are of the opinion that high government spending do crowd out private investments and hence, undermine economic growth. They are of the opinion that increases in government spending often transfer resources from the productive sector of the economy to government, where the resources are likely to be used inefficiently. They also argue that expanding public sector can complicate efforts aimed at implementing pro-growth policies such as, fundamental tax reform and personal retirement accounts (Mitchell, 2005).

Dar-Atul, A. & Amirkhalkhali, S. (2002) conducted investigation on the endogenous growth model of fiscal policy and concluded that in the endogenous growth model of fiscal policy (government expenditure and income) is very crucial in predicting future economic growth. Abdullah H. A, (2000) analyzed the relationship between government expenditure and economic growth and found that the size of government expenditure is very important in determining the performance of the economy. He further advised that, government should not only support and encourage the private sector to accelerate economic growth, but should also increase its budgetary provision on infrastructure, social and economic activities. Nijkamp, P. & Poot, J. (2004) also conducted a meta-analysis of past empirical studies of fiscal policy and growth and found that in a sample of 41 studies, 29% indicate a negative relationship between fiscal policy and growth, 17% a positive one, and 54% an inconclusive relationship. Khosravi, A. & Karimi, M. S. (2010) maintains that fiscal policy is generally believed to be associated with growth, or precisely, it is held that appropriate fiscal measures in particular circumstances can be used to stimulate economic development and growth. Ghosh & Roy (2004) investigated the impact of government expenditure on economic growth using panel data and discovered that countries with large government expenditure in term of budgetary provisions tend to experience higher economic growth, but the effect varies from one country to another. Mansouri, (2008) studied the relationship between fiscal policy and economic growth in Egypt, Morocco and Tunisia. The spans of data for each country are: 1970-2002 for Morocco, 1972- 2002 for Tunisia and 1975-2002 for Egypt. The empirical results showed that 1 percent increase in public spending raised the real GDP by 1.26 percent in Morocco, 1.15 percent in Tunisia and 0.56 percent in Egypt. The results also indicated existence of long-run relationships for all the three countries.

In Nigeria, Ekpo, (1994) studied the contributions of public expenditure to economic growth in Nigeria over the periods 1960 to 1992. The findings from the study provided support for fiscal policy-led growth through crowd-in private investment resulting from government expenditure on infrastructure. Nurudeen, & Usman, (2010) analyzed the impact of government expenditure on economic growth in Nigeria over the period 1970 – 2008. The paper revealed that government total capital expenditure, total recurrent expenditures and expenditure on education have negative effect on economic growth while expenditures on health, transport and communication are growth enhancing. On

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the other hand, Oyinlola, (1993), studied the impact of budgetary expenditure on the defense sector on economic development of Nigeria and discovered that defense expenditure exert significance positive influence on economic growth.
Aschauer, (1989 conducted a study on the impact of government spending on economic growth in the united states of America and found that, expenditure on the main infrastructure (streets and highways, mass transit, water and sewage systems and electricity and gas supplies) had a powerful explanatory role in economic growth, while infrastructure such as police and fire stations, court houses office buildings e.t.c had a mild positive statistically significance impact on growth, while education infrastructure such as construction of classroom were statistically insignificant in impacting on economic growth. Swaroop, Devarajan, & Heng-fu, (1996) used functional categories of public expenditure in their economic growth regressions. The study found out that public expenditure had a negative impact on developing countries but had a positive impact on developed countries. The study had categorized expenditure into productive and non-productive categories by taking into account the level of resources invested and output produced by different programs. For instance the study reported that government expenditure on health and transport and communications to be growth promoting but found no positive impact of education and military spending on economic growth. Albala-Bertrand & Mamatzakis (2001) using time series data covering 1960-1995 to estimate a Cobb-Douglas production function that includes public infrastructure for Chile, found a positive and significant correlation between public infrastructure and economic growth. The study reported that public investment crowds out private investment. One major weakness of the study was that it omitted impact of important variables such as education, health care and public order and security. Where Albala-Bertrand & Mamatzakis, (2001) conducting a research on impact of external debts on economic growth and investment in Kenya, found out that current investment in human capital development to be growth supporting. But lagged public investment in human capital was found to adversely affect growth. The weaknesses of the study were that the time series data used was for a short period of time and it took into account investment in human capital ignoring investment in physical infrastructure. Dar-Atul & Amirkhalkhali, (2002) set out to determine how government size affected the economic growth by looking at OECD countries in the period 1970 – 1999. The study using panel data alluded to the fact that the government size had a negative and statistically significant impact on economic

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growth. The only countries which did not fall under the above conclusion were USA, Sweden and Norway with their coefficients turning out to be statistically insignificant. Jerono (2009) conducted a study on the impact of government spending on economic growth in Kenya and found that though expenditure on education had a positive relationship with economic growth; it does not spur any significant change to growth. Given the reason that the expansion of education is higher than that of job growth in Kenya and there are relatively few job opportunities outside government for secondary and university graduates hence education have been blamed for producing surplus graduates, and long waits for government jobs. The study also asserted that a mare expenditure growth does not necessarily bring potential to spur growth; growth on the GDP was dependent on other factor too such as political will efficiency and also prioritization on the key components of the economy. Maingi, (2010) while conducting study on the impact of government expenditure on economic growth in Kenya reported that improved government expenditure on areas such as physical infrastructure development and in education enhance economic growth while areas such as foreign debts servicing, government consumption and expenditure on public order and security, salaries and allowances were growth retarding.

Infrastructure

In spite of the demonstrable importance of infrastructure, only passing reference has been made to it in the literature in relation to stabilization policies; indeed, there are few specific study of this subject till now.

Methodology and data

Methodological Framework

The question of whether an expansionary monetary policy (MP) or fiscal policy (FP) will help to raise output starts from the basic Keynesian model. In general, either an increase in government expenditure or an expansionary monetary policy (MP), leading to an increase in investment via lower interest rate, will lead to an increase in output. Nevertheless, for many years, and to some extent and even now, there is the view that Keynesians ascribe that only fiscal policy (FP) can affect income and output, while monetarists believe that only MP can have such an effect. It turns out, therefore, that in certain special cases, only FP works and in another special case, only MP works. It has, however, been observed that only FP

will work, and MP will not have any effect, if one of the links between changes in money supply and changes in investment is broken.

The accounts of Keynesian theory concentrate on the liquidity trap as the extreme Keynesian special case. The important implication of the liquidity trap is that once the rate of interest has fallen to the level at which the liquidity trap occurs, an increase in the money supply will not reduce the interest rate any further.

Therefore if the level of investment which could occur at this minimum rate of interest is still not great enough to provide expenditure equal to full employment output, then MP will not be able to increase investment and thereby restore full employment and income by this route. However, in a liquidity trap, an increase in government expenditure will still increase output. In fact, as long as we remain in liquidity trap, an increase in government expenditure will have the full effect on income predicted by the multiplier because interest rates do not rise at all and there is no crowding out of private investment to offset any of the effects of the increase in government expenditure. Hence, this becomes the basis for supporting the fiscal action of the government to boost output. On the other hand, those who accuse Keynesian believe that only fiscal policy can work, and that monetary policy cannot, then point out the extreme unlikelihood of liquidity trap, and the lack of evidence that it has ever occurred. It seems to us, however, that most of those Keynesians who claim that monetary policy cannot raise income did not have liquidity trap in mind. Instead they usually based their view on the other link between monetary policy and investment. If investment is completely insensitive to the rate of interest, then monetary policy will have no effect even if it does to a fall in the interest rate accept that investment is sensitive to interest rate. By now, virtually all economists accept that investment is sensitive to interest rate. It follows therefore that the general theoretical framework accepted by Keynesians indicated that provided that the economy was not in a liquidity trap and provided that there was some sensitivity of investment to interest rates, monetary policy would affect output. This view is now accepted as the empirically relevant case. From the foregoing, the study follows the Keynesian model and the quantity theory of money theoretical underpinning.

The study would follow Bakare-Aremu, & Osobase, (2015) who estimated a slightly modified form of the basic St. Louis equation of the form:

$$Y_t = go + \Sigma_{mi}M_{t-i} + \Sigma f_j F_{t-i} + \Sigma_{xi}X_{t-i} + \mu_t \quad \text{---------- (1)}$$

The log-linear model will take the form:

$$InY_t = \alpha o + \beta_1 InM_t + \beta_2 InF_t + \beta_3 InX_{t-} + \mu_t \quad \text{---------- (2)}$$

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where, *Y* is the index of industrial production (proxy for industrialization), *M*, *F*, and *X* are the vectors of monetary, fiscal, and infrastructure variables respectively. The study shall pre-estimate the following equation:

$\Delta Y_t = (Y_t - Y_{t-1}) = \mu_t$ …… (3)

This is simple enough, to ensure that the variables attain stationarity,

The cointegrated equation for the model is stated as:

$$\left[\eta_m \log Y_t = \alpha_0 + \sum_{i=1}^{p} \alpha_i \eta_m Z_i - \left[\eta_m \log Y_t - \sum_{i=1}^{p} \beta X_{i-1} + \nu_{1t}\right]\right] \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

Where

$[\eta_m \log Y_t - \sum_{i-1} \beta X_{t-i}]$ is the linear combination of the co-integrated vectors. The presence of unit root and co-integration is the necessary and sufficient condition for an error correction mechanism

The Error Correction Model equation

If equation 4 is true, then the individual influence of the co integrated variables cannot be separated unless with an error correction mechanism through and error correction model.

$$\left[\eta_m \log Y_t = \alpha_0 + \sum_{i=1}^{p} \alpha_i \eta_m Z_i - \lambda ECM_{i=1} + \nu_{2t}\right] \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

Where $-\lambda ecm$ is the error correction mechanism, $-\lambda$ is the magnitude of error corrected each period specified in it's a priori form so as to restore $\eta_m \log Y_t$ to equilibrium.

To estimate the above equation, quarterly secondary data from 2005-2016 would be sourced from Central Bank of Nigeria statistical bulletin 2017 edition.

Results and Discussion

Summary statistics of the Variables under investigation

Table 1: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
iid	57	4214.045	7593.943	6	46012.52
m2	57	5229.511	10451.95	6.25	63218.72
intr	57	4375.545	8783.708	8	54612.27
grev	57	5384.573	11220.71	10.5087	69023.93
gexp	56	4861.064	9895.421	6	59929.89
tranf	57	4095.139	8034.358	8	49856.1
comnf	57	5381.755	10865.94	11.4337	67152.79
egwnf	57	4470.62	9279.648	9.75	57511.04

In this result, the observation is 57 for all the variables except for government expenditure that has one missing value. There appear to be wide variation in the

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spread of the data as the standard deviation of all the variables are greater than the mean values. More so, there is a wide variation between the minimum and maximum values of each variable. The data appear to be skewed to the left, which explains why the mean values could be greater than the median values.

Pre-estimation test

The study employed Augmented Dickey-Fuller test to investigate the level of stationarity of the variables and found that all the variables are stationary after first differencing (see appendix 1). However, government expenditure, communication infrastructure, and electricity, gas and water infrastructure are stationary after differencing at 10 percent critical values while other variables are stationary at the conventional 5 percent level of significance.

Estimated results before logarithm and differencing shows that interest rate and transportation infrastructure are the only variables with significant effect on industrialization (see appendix 2). However, after introducing logarithm to obtain their rate of change, the number of variables with significant effect on industrialization increased to 3 with the addition of communication infrastructure. Surprisingly, after differencing and logarithmic introduction, only electricity, gas and water infrastructure had significant effect on industrialization index with a positive sign (see appendix 3). The value of the coefficient shows that increase in electricity, gas and water infrastructure by 1 percent would increase industrialization index by about 73 percent. This finding conforms to the finding by Bakare-Aremu, & Osobase, (2015) for OECD countries and Maingi, (2010) Jerono (2009) for Kenya.

However, there appear to be some sign of astonishment with broad money supply and government revenue. Results show that increases in money supply and government revenue would lead to a decline in industrialization index. But this could be explained by Nigeria's high corruption index especially in the management of its revenue. This is in line with the findings by Jerono (2009) and Swaroop, Devarajan, & Heng-fu, (1996) for developing countries.

Substituted Coefficients:

==========

LOG(D(IID)) = 4.976455898 - 0.7150406902*LOG(D(M2)) - 0.240603397*D(INTR) - 0.1032666635*LOG(D(GREV)) + 1.672320549*LOG(D(GEXP)) -

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0.07814734192*LOG(D(TRANF)) + 0.7271236179*LOG(D(EGWNF)) - 0.8375042707*LOG(D(COMNF))

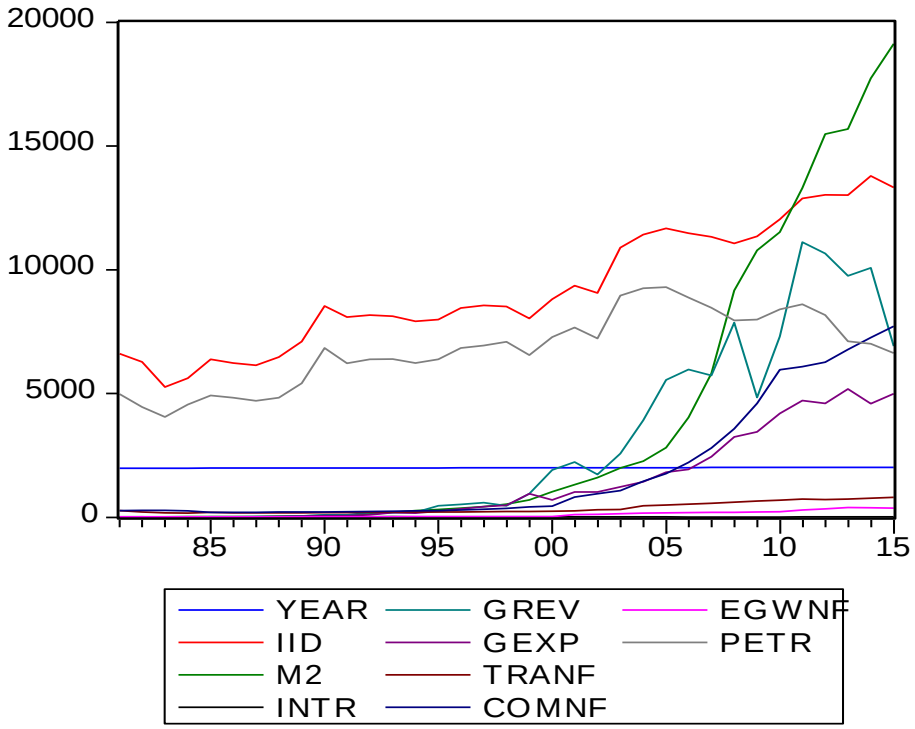


Figure 3: Relationship between stabilization policies, infrastructure and industrialization.

The figure suggests that industrialization index increases gradually as other variables increase but the study is unsure that the increase in other variables causes the gradual increase in industrialization.

Deterministic linear trend (Johansen Cointegration)

Lags interval: 1 to 1

	Likelihood	5 Percent	1 Percent	Hypothesized
Eigenvalue	Ratio	Critical Value	Critical Value	No. of CE(s)
0.937010	257.9770	124.24	133.57	None **
0.869123	166.7394	94.15	103.18	At most 1 **
0.647614	99.63396	68.52	76.07	At most 2 **
0.614245	65.21399	47.21	54.46	At most 3 **

0.376608	33.77974	29.68	35.65	At most 4 *
0.288345	18.18462	15.41	20.04	At most 5 *
0.190135	6.959275	3.76	6.65	At most 6 **
***(**) denotes rejection of the hypothesis at 5%(1%) significance level**				

The null hypothesis is that there is no cointegration among the explanatory variables in the model. The cointegration result shows that there are 5 cointegration equations at rank 1. This implies a long-run relationship between the explanatory variables and industrialization index. The error correction mechanism suggests that the short-run disequilibrium would be corrected in the next period to the tune of 53 percent (see appendix 4).

Causality test result

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
M2 does not Granger Cause IID	33	0.48852	0.61866
IID does not Granger Cause M2		3.67046	0.03840
INTR does not Granger Cause IID	33	0.13758	0.87205
IID does not Granger Cause INTR		1.24741	0.30272
GREV does not Granger Cause IID	33	0.11877	0.88846
IID does not Granger Cause GREV		1.89250	0.16947
GEXP does not Granger Cause IID	33	1.35718	0.27380
IID does not Granger Cause GEXP		2.35665	0.11326
TRANF does not Granger Cause IID	33	1.44468	0.25286
IID does not Granger Cause TRANF		5.76947	0.00798
COMNF does not Granger Cause IID	33	0.77672	0.46957
IID does not Granger Cause COMNF		2.52448	0.09818
EGWNF does not Granger Cause IID	33	0.42106	0.66044
IID does not Granger Cause EGWNF		2.08881	0.14271

At lag 2, result shows that a change in the index of industrial production would cause a change in broad money supply and transportation infrastructure.

However, none of the explanatory variables granger causes the changes in index of industrial production.

At lag 4

Lags: 4

Null Hypothesis:	Obs	F-Statistic	Probability
M2 does not Granger Cause IID	31	1.23597	0.32461
IID does not Granger Cause M2		2.18514	0.10412
INTR does not Granger Cause IID	31	0.11135	0.97723
IID does not Granger Cause INTR		1.52595	0.22925
GREV does not Granger Cause IID	31	0.30410	0.87207
IID does not Granger Cause GREV		0.88355	0.48993
GEXP does not Granger Cause IID	31	0.91674	0.47176
IID does not Granger Cause GEXP		2.22972	0.09877
TRANF does not Granger Cause IID	31	0.76066	0.56199
IID does not Granger Cause TRANF		3.10191	0.03627
COMNF does not Granger Cause IID	31	0.58746	0.67512
IID does not Granger Cause COMNF		2.14838	0.10875
EGWNF does not Granger Cause IID	31	1.48915	0.23963
IID does not Granger Cause EGWNF		2.26153	0.09514

At lag 4, the study discovered that changes in the index of industrial production granger causes the changes in transportation infrastructure as well. However, no other causality (unidirectional or bidirectional causality) exists between the index of industrial production and other explanatory variables.

Disaggregating industrial output

The study disaggregated industrial output into three sectors – crude petroleum and natural gas, manufacturing sector, and solid mineral sector. The study found that government revenue (fiscal policy) communication infrastructure, and electricity, gas and water infrastructure have significant effect on the development of crude petroleum and natural gas (see appendix 5a).

The study on solid mineral sector suggests that interest rate (monetary policy) has a significant inverse relationship with the development of solid minerals. Again, the study found that all the infrastructural variables have significant effect on solid mineral development (see appendix 5b).

The result on manufacturing sector suggests that interest rate (monetary policy) has a significant inverse effect on manufacturing sector development. This implies that a decrease in interest rate would spur growth in the manufacturing sector. Also, the result found that transportation infrastructure plays a significant role in the development of the manufacturing sector (see appendix 5c).

Conclusion

Nigeria has all it takes to confront the urgent task of turning around her infrastructure and building an economy that will surpass all predictions. The country has the most important asset a nation needs, to be at the top – a very determined people – never giving up when even no one gives them a chance to pull through. Just 17 years ago Nigeria had only 400,000 phone lines today Nigeria has about 100 million. In 2015, Nigeria pulled a peaceful election even when some predicted her disintegration. The country has the energy to confront her challenges coming up stronger and better even sometimes from behind. With strong determination and positive actions we will surmount our industrialization challenges.

Though the obstacles to accelerated industrial expansion in Nigeria are daunting they are surmountable. Once policy makers and implementers summon the will to immediately take far-reaching actions that are focused and sustained along the following lines; (I). Reordering government expenditure to allow for commitment of at least fifty per cent of government revenue to Capital Expenditure in the 2018 budget and with the aim of increasing to sixty per cent and seventy per cent in 2019 and 2020 budget cycle respectively. (2). The Federal Government should embark on Contractor financed infrastructure projects based on internationally benchmarked pricing; in the construction of rail tracks, supply of locomotives and coaches, and other critical infrastructure. Such selected projects must have the necessary projected cash –flow to pay back to qualify for approval. (3). There should be an immediate bid process for the concessioning of two sites for the construction of two green field ports in areas with the natural port depths. (4). Immediate elimination of bureaucratic curtains, red tapes and elimination of duplication of regulatory approvals for private sector direct investment in infrastructural development as now common in the power sector. This is to be achieved by the instrumentality of a sectorial guideline that institutes a Standard Operating Procedure detailing timeline for processing applications with a high-level audit system of the processes. (5). The Federal Government should use its

Sovereign Financial Instruments to give credit guarantees to strategic private sector investments in key areas such as power generation and transmission as well as other urgent infrastructural priorities.

The study has listed below some important policy objective and goals that will form the direction of a new economy imbued with the capacity for achieving sustainable development; (a) Monetary and Fiscal Policy must be geared towards the growth of the Infrastructure, Manufacturing, and solid mineral. (b) Tax and Revenue collection must be reformed to increase nationally collectable revenues. (c) Interest rate must be kept at single digit between 6-8%. (d) Economic planners must prioritize massive investment in iron and steel, meteorology, machine tools, glass production and petrochemicals.

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APPENDIX

1.

ADF M2

ADF Test Statistic	**-4.905741**	**1% Critical Value***		**-4.2712**
		5% Critical Value		-3.5562
		10% Critical Value		-3.2109
***MacKinnon critical values for rejection of hypothesis of a unit root.**				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(IID,2)				
Method: Least Squares				
Date: 01/12/80 Time: 20:01				
Sample(adjusted): 1984 2015				
Included observations: 32 after adjusting endpoints				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IID(-1))	-1.227159	0.250147	-4.905741	0.0000
D(IID(-1),2)	0.165264	0.178253	0.927128	0.3618
C	279.8838	219.2083	1.276794	0.2122
@TREND(1981)	1.052139	10.89939	0.096532	0.9238
R-squared	0.574066	Mean dependent var		16.74455
Adjusted R-squared	0.528431	S.D. dependent var		805.8051
S.E. of regression	553.3537	Akaike info criterion		15.58634
Sum squared resid	8573609.	Schwarz criterion		15.76956
Log likelihood	-245.3814	F-statistic		12.57931

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Durbin-Watson stat	1.969387	Prob(F-statistic)	0.000022

ADF INTR

ADF Test Statistic	**-5.478400**	**1% Critical Value***		**-3.6496**
		5% Critical Value		-2.9558
		10% Critical Value		-2.6164
***MacKinnon critical values for rejection of hypothesis of a unit root.**				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(INTR,2)				
Method: Least Squares				
Date: 01/12/80 Time: 20:06				
Sample(adjusted): 1984 2015				
Included observations: 32 after adjusting endpoints				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INTR(-1))	-1.627827	0.297135	-5.478400	0.0000
D(INTR(-1),2)	0.210116	0.180934	1.161287	0.2550
C	0.260914	0.636382	0.409996	0.6848
R-squared	0.687111	Mean dependent var		0.000000
Adjusted R-squared	0.665533	S.D. dependent var		6.204512
S.E. of regression	3.588266	Akaike info criterion		5.482275
Sum squared resid	373.3939	Schwarz criterion		5.619688
Log likelihood	-84.71640	F-statistic		31.84232
Durbin-Watson stat	1.963470	Prob(F-statistic)		0.000000

GEXP

ADF Test Statistic	**-3.515037**	**1% Critical Value***		**-4.3226**
		5% Critical Value		-3.5796
		10% Critical Value		-3.2239
***MacKinnon critical values for rejection of hypothesis of a unit root.**				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(GEXP,2)				
Method: Least Squares				
Date: 01/12/80 Time: 20:33				
Sample(adjusted): 1988 2015				
Included observations: 28 after adjusting endpoints				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GEXP(-1))	-2.135394	0.607503	-3.515037	0.0022
D(GEXP(-1),2)	0.570120	0.531619	1.072422	0.2963

D(GEXP(-2),2)	1.277767	0.484358	2.638065	0.0158
D(GEXP(-3),2)	2.033944	0.513082	3.964167	0.0008
D(GEXP(-4),2)	1.561770	0.573398	2.723711	0.0131
D(GEXP(-5),2)	0.553822	0.356767	1.552336	0.1363
C	-313.9952	162.1319	-1.936665	0.0670
@TREND(1981)	30.57460	11.54557	2.648167	0.0154
R-squared	0.851662	Mean dependent var		14.13157
Adjusted R-squared	0.799743	S.D. dependent var		447.9201
S.E. of regression	200.4444	Akaike info criterion		13.67391
Sum squared resid	803559.0	Schwarz criterion		14.05454
Log likelihood	-183.4347	F-statistic		16.40386
Durbin-Watson stat	2.046161	Prob(F-statistic)		0.000001

ADF TRANF

ADF Test Statistic	**-3.054760**	**1% Critical Value***		**-3.6496**
		5% Critical Value		-2.9558
		10% Critical Value		-2.6164
***MacKinnon critical values for rejection of hypothesis of a unit root.**				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(TRANF,2)				
Method: Least Squares				
Date: 01/12/80 Time: 20:36				
Sample(adjusted): 1984 2015				
Included observations: 32 after adjusting endpoints				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TRANF(-1))	-0.634059	0.207564	-3.054760	0.0048
D(TRANF(-1),2)	-0.306349	0.160433	-1.909513	0.0661
C	14.02366	6.343103	2.210851	0.0351
R-squared	0.515217	Mean dependent var		2.135434
Adjusted R-squared	0.481783	S.D. dependent var		42.13985
S.E. of regression	30.33532	Akaike info criterion		9.751563
Sum squared resid	26686.72	Schwarz criterion		9.888975
Log likelihood	-153.0250	F-statistic		15.41028
Durbin-Watson stat	2.089443	Prob(F-statistic)		0.000028

COMNF

ADF Test Statistic	**-3.267113**	**1% Critical Value***	**-4.2712**
		5% Critical Value	-3.5562
		10% Critical Value	-3.2109
***MacKinnon critical values for rejection of hypothesis of a unit root.**			

Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(COMNF,2)				
Method: Least Squares				
Date: 01/12/80 Time: 20:41				
Sample(adjusted): 1984 2015				
Included observations: 32 after adjusting endpoints				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(COMNF(-1))	-0.658564	0.201574	-3.267113	0.0029
D(COMNF(-1),2)	0.129642	0.186563	0.694897	0.4928
C	-145.2020	102.7826	-1.412710	0.1688
@TREND(1981)	16.27509	6.606179	2.463617	0.0202
R-squared	0.303799	Mean dependent var		14.17190
Adjusted R-squared	0.229206	S.D. dependent var		259.5855
S.E. of regression	227.9027	Akaike info criterion		13.81218
Sum squared resid	1454310.	Schwarz criterion		13.99540
Log likelihood	-216.9949	F-statistic		4.072760
Durbin-Watson stat	1.970247	Prob(F-statistic)		0.016090

ADF EGWNF

ADF Test Statistic	**-2.716697**	**1% Critical Value***	**-3.6496**
		5% Critical Value	-2.9558
		10% Critical Value	-2.6164
***MacKinnon critical values for rejection of hypothesis of a unit root.**			
Augmented Dickey-Fuller Test Equation			
Dependent Variable: D(EGWNF,2)			
Method: Least Squares			
Date: 01/12/80 Time: 20:43			
Sample(adjusted): 1984 2015			
Included observations: 32 after adjusting endpoints			
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EGWNF(-1))	-0.636203	0.234183	-2.716697	0.0110
D(EGWNF(-1),2)	-0.134794	0.189439	-0.711544	0.4824
C	6.580069	4.805456	1.369291	0.1814
R-squared	0.371149	Mean dependent var		-0.631730
Adjusted R-squared	0.327780	S.D. dependent var		27.34194
S.E. of regression	22.41739	Akaike info criterion		9.146611
Sum squared resid	14573.64	Schwarz criterion		9.284023
Log likelihood	-143.3458	F-statistic		8.557936

Durbin-Watson stat	1.902329	Prob(F-statistic)	0.001199

2.

Dependent Variable: LOG(IID)				
Method: Least Squares				
Date: 08/02/17 Time: 17:29				
Sample: 1981 2015				
Included observations: 35				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(M2)	0.036388	0.221667	0.164157	0.8708
INTR	0.037370	0.010382	3.599594	0.0012
LOG(GREV)	-0.001478	0.145351	-0.010166	0.9920
LOG(GEXP)	-0.022599	0.224097	-0.100845	0.9204
LOG(TRANF)	2.296123	0.196398	11.69116	0.0000
LOG(COMNF)	-0.656966	0.278129	-2.362093	0.0254
LOG(EGWNF)	-0.078009	0.168119	-0.464011	0.6462
R-squared	0.591689	Mean dependent var		9.093698
Adjusted R-squared	0.504194	S.D. dependent var		0.275240
S.E. of regression	0.193806	Akaike info criterion		-0.267059
Sum squared resid	1.051704	Schwarz criterion		0.044010
Log likelihood	11.67354	Durbin-Watson stat		1.649921

3. MODEL RESULT AFTER DIFFERENCING

Dependent Variable: D(IID)				
Method: Least Squares				
Date: 01/12/80 Time: 20:48				
Sample(adjusted): 1982 2015				
Included observations: 34 after adjusting endpoints				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	154.6281	124.4521	1.242471	0.2252
D(M2)	-0.109197	0.146924	-0.743218	0.4640
D(INTR)	15.06333	28.39446	0.530502	0.6003
D(GREV)	0.153728	0.086334	1.780613	0.0867
D(GEXP)	-0.935464	0.475218	-1.968495	0.0598
D(TRANF)	2.739029	3.336130	0.821020	0.4191
D(EGWNF)	5.275552	5.049175	1.044834	0.3057
D(COMNF)	0.498840	0.473845	1.052748	0.3021
R-squared	0.250190	Mean dependent var		197.5258
Adjusted R-squared	0.048318	S.D. dependent var		569.6078
S.E. of regression	555.6763	Akaike info criterion		15.68057
Sum squared resid	8028181.	Schwarz criterion		16.03972
Log likelihood	-258.5697	F-statistic		1.239349
Durbin-Watson stat	2.312877	Prob(F-statistic)		0.317850

COINTEGRATION

Date: 01/12/80 Time: 21:14				
Sample: 1981 2015				
Included observations: 33				
Test assumption: Linear deterministic trend in the data				
Series: M2 INTR GREV GEXP TRANF COMNF EGWNF				
Lags interval: 1 to 1				
	Likelihood	5 Percent	1 Percent	Hypothesized
Eigenvalue	Ratio	Critical Value	Critical Value	No. of CE(s)
0.937010	257.9770	124.24	133.57	None **
0.869123	166.7394	94.15	103.18	At most 1 **
0.647614	99.63396	68.52	76.07	At most 2 **
0.614245	65.21399	47.21	54.46	At most 3 **
0.376608	33.77974	29.68	35.65	At most 4 *
0.288345	18.18462	15.41	20.04	At most 5 *
0.190135	6.959275	3.76	6.65	At most 6 **
***(**) denotes rejection of the hypothesis at 5%(1%) significance level**				
L.R. test indicates 7 cointegrating equation(s) at 5% significance level				
Unnormalized Cointegrating Coefficients:				
M2	INTR	GREV	GEXP	TRANF
-7.68E-05	0.002979	0.000239	0.000150	-0.009451
0.000351	-0.000111	0.000250	-6.28E-05	0.000429
-0.000191	0.017902	-0.000277	-2.26E-05	0.003016
0.000692	-0.012309	-0.000259	-0.000966	0.007614
-0.000297	0.013102	-2.01E-05	-0.000284	-0.003843
2.08E-05	-0.012553	-0.000498	0.001230	0.002095
-0.000234	-0.058839	0.000141	0.000373	-0.006219
Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)				
M2	INTR	GREV	GEXP	TRANF
1.000000	-38.80467	-3.107185	-1.951960	123.1102
	(42.6334)	(1.61574)	(1.02837)	(59.2024)
Log likelihood	-1246.359			

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Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)					
M2	INTR	GREV	GEXP	TRANF	
1.000000	0.000000	0.743226	-0.164292	0.216431	
		(1.27923)	(0.73337)	(40.9157)	
0.000000	1.000000	0.099225	0.046068	-3.166984	
		(0.10596)	(0.06075)	(3.38908)	
Log likelihood	-1212.806				
Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)					
M2	INTR	GREV	GEXP	TRANF	
1.000000	0.000000	0.000000	-0.505948	23.45164	
			(0.33698)	(4.79690)	
0.000000	1.000000	0.000000	0.000455	-0.064934	
			(0.01161)	(0.16530)	
0.000000	0.000000	1.000000	0.459693	-31.26264	
			(0.26048)	(3.70787)	
Log likelihood	-1195.596				
Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)					
M2	INTR	GREV	GEXP	TRANF	
1.000000	0.000000	0.000000	0.000000	41.52318	
				(26.3464)	
0.000000	1.000000	0.000000	0.000000	-0.081190	
				(0.50415)	
0.000000	0.000000	1.000000	0.000000	-47.68203	
				(20.7102)	
0.000000	0.000000	0.000000	1.000000	35.71817	
				(29.3444)	
Log likelihood	-1179.879				
Normalized Cointegrating Coefficients: 5 Cointegrating Equation(s)					
M2	INTR	GREV	GEXP	TRANF	
1.000000	0.000000	0.000000	0.000000	0.000000	
0.000000	1.000000	0.000000	0.000000	0.000000	
0.000000	0.000000	1.000000	0.000000	0.000000	

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0.000000	0.000000	0.000000	1.000000	0.000000
0.000000	0.000000	0.000000	0.000000	1.000000
Log likelihood	-1172.082			
Normalized Cointegrating Coefficients: 6 Cointegrating Equation(s)				
M2	INTR	GREV	GEXP	TRANF
1.000000	0.000000	0.000000	0.000000	0.000000
0.000000	1.000000	0.000000	0.000000	0.000000
0.000000	0.000000	1.000000	0.000000	0.000000
0.000000	0.000000	0.000000	1.000000	0.000000
0.000000	0.000000	0.000000	0.000000	1.000000
0.000000	0.000000	0.000000	0.000000	0.000000
Log likelihood	-1166.469			

5a PETR MODEL

Dependent Variable: LOG(PETR)				
Method: Least Squares				
Date: 08/02/17 Time: 17:51				
Sample: 1981 2015				
Included observations: 35				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.285051	0.531920	15.57575	0.0000
LOG(M2)	-0.114154	0.078130	-1.461084	0.1555
LOG(INTR)	-0.093753	0.053910	-1.739052	0.0934
LOG(GREV)	0.159525	0.051591	3.092126	0.0046
LOG(GEXP)	0.053246	0.077293	0.688892	0.4968
LOG(TRANF)	0.200517	0.148514	1.350157	0.1882
LOG(COMNF)	0.231035	0.106167	2.176148	0.0385
LOG(EGWNF)	0.135495	0.060087	2.254990	0.0324
R-squared	0.930091	Mean dependent var		8.797063
Adjusted R-squared	0.911967	S.D. dependent var		0.232219
S.E. of regression	0.068900	Akaike info criterion		-2.314686
Sum squared resid	0.128175	Schwarz criterion		-1.959178
Log likelihood	48.50701	F-statistic		51.31691
Durbin-Watson stat	1.497644	Prob(F-statistic)		0.000000

5b SOLM MODEL

Dependent Variable: LOG(SOLM)
Method: Least Squares

Date: 08/02/17 Time: 17:53				
Sample: 1981 2015				
Included observations: 35				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.927421	1.268960	-3.094992	0.0045
LOG(M2)	-0.050192	0.186388	-0.269290	0.7898
LOG(INTR)	-0.496223	0.128609	-3.858381	0.0006
LOG(GREV)	-0.016474	0.123076	-0.133850	0.8945
LOG(GEXP)	-0.333031	0.184391	-1.806108	0.0821
LOG(TRANF)	0.745321	0.354298	2.103658	0.0449
LOG(COMNF)	0.902992	0.253274	3.565281	0.0014
LOG(EGWNF)	0.418081	0.143345	2.916611	0.0070
R-squared	0.915633	Mean dependent var		3.540546
Adjusted R-squared	0.893760	S.D. dependent var		0.504287
S.E. of regression	0.164370	Akaike info criterion		-0.575767
Sum squared resid	0.729469	Schwarz criterion		-0.220258
Log likelihood	18.07591	F-statistic		41.86156
Durbin-Watson stat	1.096999	Prob(F-statistic)		0.000000

5c MANU MODEL

Dependent Variable: LOG(MANU)				
Method: Least Squares				
Date: 08/02/17 Time: 17:54				
Sample: 1981 2015				
Included observations: 35				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.092716	1.129422	0.082091	0.9352
LOG(M2)	0.294177	0.165892	1.773304	0.0875
LOG(INTR)	-0.548369	0.114467	-4.790634	0.0001
LOG(GREV)	-0.129782	0.109542	-1.184767	0.2464
LOG(GEXP)	-0.198174	0.164115	-1.207528	0.2377
LOG(TRANF)	1.106662	0.315338	3.509444	0.0016
LOG(COMNF)	0.134905	0.225423	0.598451	0.5545
LOG(EGWNF)	-0.242054	0.127582	-1.897243	0.0685
R-squared	0.929074	Mean dependent var		7.649514
Adjusted R-squared	0.910686	S.D. dependent var		0.489519
S.E. of regression	0.146295	Akaike info criterion		-0.808750
Sum squared resid	0.577861	Schwarz criterion		-0.453242
Log likelihood	22.15313	F-statistic		50.52557
Durbin-Watson stat	1.201623	Prob(F-statistic)		0.000000