

Foreign Direct Investments and Industrial Productivity in Nigeria

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Abstract

The potential impact of Foreign Direct investments (FDI) on recipient and investing economies is of considerable policy interest. Important to the theory of foreign direct investments in Nigeria are the questions of whether foreign investors coming to Nigeria are market seeking or export driven ; if they are natural resource seeking or strategic asset driven. This finding is relevant to economic managers in the design and implementation of appropriate macroeconomic policies to attract FDI. It is also relevant to investigate whether FDI contributes to overall capacity development of the economy or not .This study investigates the contribution of FDI to industrial productivity in Nigeria. Using the disaggregated components of industrial productivity i.e.(Industrial, Manufacturing and Mining sector productivity indices) as proxies for the dependent variables. These were regressed against Foreign Direct Investments ; expressed as a function of Gross Domestic Product ; this is in conjunction with other independent and control variables that are deemed to affect the level of industrial productivity. Outcome of the study indicates that industrial productivity in Nigeria is not FDI driven. However, upon disaggregation into component sectors, it was ascertained that FDI has a positive and significant relationship with mining sector productivity in Nigeria at 5% Alpha level in the short run. This did not come as a surprise seeing that the oil industries belong to this sector. The impact of FDI is mostly restricted to the oil sector. The weak linkage between the oil sector and the rest of the economy hinders any possible spillover effects from FDI unto the larger economy. The study concludes that our over reliance on foreign direct investments as a source of economic growth and industrial productivity has not been justified. While we reiterate that, there might be need for foreign direct investments, we should not be totally dependent on it.. The study therefore, recommends a conscious effort on the path of federal government to look inwards for productivity enhancing attributes that could cater for our developmental needs as no foreign nation will do it for us . It is also being advised that the Nigerian government and policy formulators need to enact some investor friendly policies that will encourage, promote and attract/retain more foreign direct investments and to provide a conducive and enabling environment.

Key words: Foreign Direct Investment, Industrial sector productivity, Manufacturing sector productivity Mining sector productivity.

Background of the study

According to UNCTAD (2009), FDI involves an investor acquiring a lasting interest in overseas enterprises and markets. In doing so, FDI allows an investor to gain an "effective voice" in the management of specific indigenous industries. It is further anticipated that FDI encourages the transfer of management skills, intellectual property, and technology to where it is needed most. Alongside job creation, FDI should also help improve the quality of goods and services produced in the economy, thereby boosting export potential. Accordingly, FDI can stimulate the adoption of international production standards and working methods.

On the other hand, productivity is a crucial factor in production performance of firms and nations. Increasing industrial productivity can raise living standards because more real income improves people's ability to purchase goods and services, enjoy leisure, improve housing and education and contribute to social and environmental programs. Productivity growth also helps businesses to be more profitable. Productivity is considered a key source of economic growth and competitiveness and, as such, is basic statistical information for many international comparisons and country performance assessments (udo aka -1983).

A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker." According to Dutse, Okwoli and kurfi (2011), the national quest for scientific and technological know-how through FDI which is required to improve low level productivity and achieve sustainable economic development has gathered momentum in recent years. Nigeria, after decades of restricting FDI like other developing countries (Marin, 2008), is now falling over to attract external investors, and spending large sums of money to attract foreign companies. Yauri (2006) reports that FDI-related foreign economic policies received most significant attention of the Nigerian government in the last two decades, which resulted in the signing of bilateral and multilateral treaties aimed at encouraging the inflows of FDI.

Young et al. (1994) identified that, FDI inflows if properly harnessed can bring in the latest technology, create employment and lead to tradable goods. They further opined that FDI not only enables the transfer of

intangibles to another country but also makes knowledge spillovers possible and therefore may play a role in the growth and development of indigenous entrepreneurship. These knowledge spillovers can lead to the establishment of new home-grown enterprises in the host country leading to improved industrial productivity.

Terjesen et.al (2007), opined that during the course of FDI activities, there is a transfer of technology and intangibles to the host country that involves people and machinery, and some of these knowledge spillover's are not necessarily intentional, given that the Multinationals are profit-maximizing entities and will not be willing to transfer knowledge unless it obtains a return. Whereas, knowledge spillovers has been regarded as a resultant effect of a gap in technology between foreign and local firms. However, in the literature, not all types of FDI have the same potentials for knowledge spillovers.

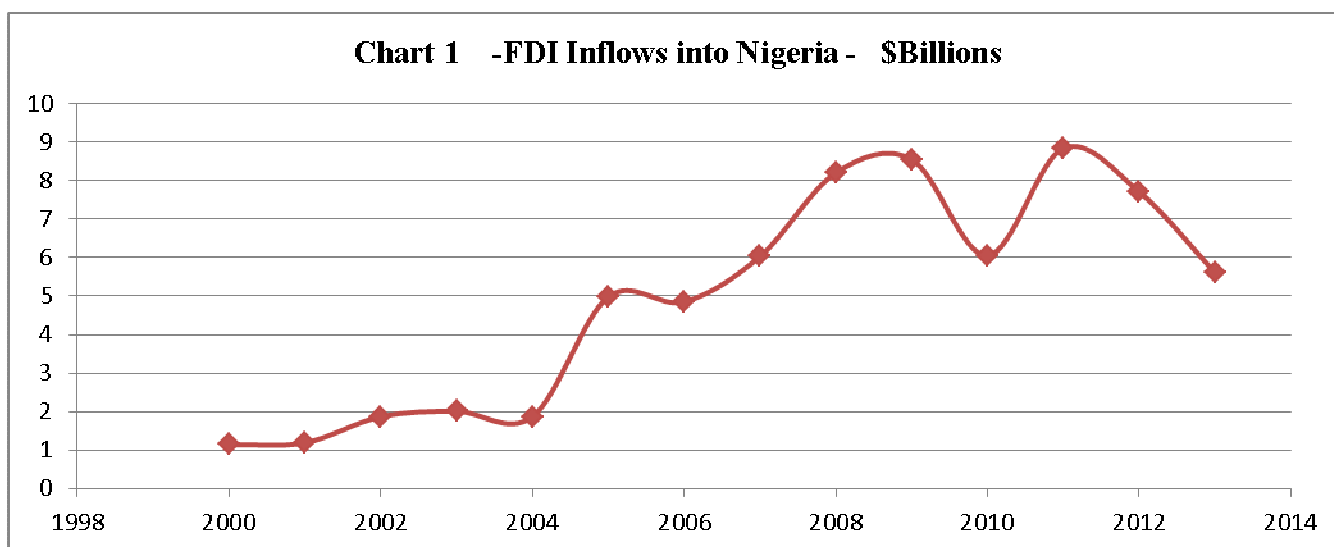
It has also been emphasized by several development economists like Bianchini (2010), that the integration of developing countries with the global economy increased sharply in the 1990s with changes in their economic policies and lowering of barriers to trade and investment. Most countries strive to attract foreign direct investment (FDI) because of a probable or seemingly acknowledged advantages as a tool of economic development and enhanced industrial productivity.

In tandem with these line of thoughts, this study is set to evaluate the contributions or otherwise of foreign direct investment on industrial growth and productivity in Nigeria.

1.2 Statement of Research Problem

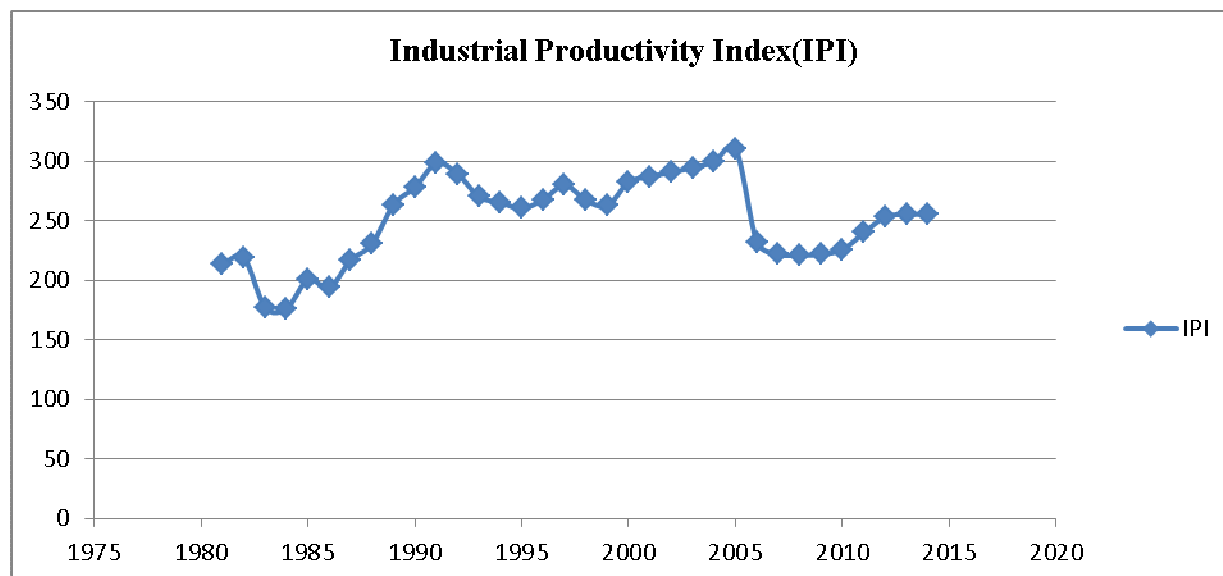
While FDI is assumed to generate a virtuous circle of higher productivity, it can also provide the much needed resources such as capital, techniques of production, managerial and marketing expertise. Others include advanced product and business practices, human capital development and brand access to markets which are essential for developing countries to industrialize.

A closer review of FDI trends revealed that, there has been a remarkable level of FDI inflows into Nigeria in the recent past. This is depicted in chart 1 below :



Source: The World Bank

In the above chart, FDI witnessed a period of lull between 2000 and 2004. Thereafter it improved tremendously especially in years 2006, 2008, and 2009 respectively. This nose-dived in 2010 but came up in 2011 and has not maintained nor shown any signs of increased/ improved inflows. The same may not be said of the level of industrial productivity in Nigeria as depicted in chart 2 below :



Source: CBN Statistical Bulletin

From the above chart, industrial productivity index stood at about 200 in 1981. It increased geometrically to about 280 in 1999; maintained a boom and burst cycle till 2005 when it climaxed to 310. After which, it crashed to about 225 in 2010 and has not shown any further sign of improvement. In the ensuing scenario, industrial productivity has not maintained an impressive trend. It's been relatively ineffective. This is quite disturbing. It is far from being satisfactory and obviously points towards an ailing and backward economy.

While FDI inflows has witnessed a relative increase; the same may not be said of the level of industrial productivity in Nigeria. Our apriori expectations are that, with an increased FDI inflows, there should be an increase too in the level of industrial productivity. That is the crux of the matter !

In view of the poor and unsatisfactory productivity trends in Nigeria, this study is set to analyze how much of FDI inflows were actually attracted to Nigeria ; the possible usage to which they were put , the direction, significance and the impact of FDI inflows on industrial productivity in Nigeria.

Research activities based on the relationship between FDI and improved productivity in a developing country like Nigeria has been scanty.(See Ayanwale (2007), Umah (2007) and Abdullahi 2008,). While some of the studies concentrated on FDI as a growth inducing phenomenon, a few others dwelt on its impact on total factor productivity.

Industrial productivity in a third world country like Nigeria is an under researched topic. This is mainly because of the scarcity of comprehensive comparable data suitable for analysis. Thus , the linkage between foreign direct investments (FDI) and productivity in Nigeria is yet unclear.

This research is set to evaluate the impact of foreign direct investments on industrial productivity in Nigeria. Again since international trade is the medium through which FDI thrives, this study will also seek to identify the contributions or otherwise of exports , imports , inflationary trends and trade openness to the level of industrial productivity in Nigeria. The conclusion is therefore trite that existing state of research shows a conceptual weakness providing further impetus for this study.

Centrally, the study is intended to ascertain the impact of foreign direct investments on industrial productivity in Nigeria. It will investigate the mismatch between financial and service accruals from foreign direct investments and an abysmal low industrial productivity in Nigeria. The study also, will accomplish the following:

b) To determine the effect of export and import trades, Gross domestic product per capita, the degree of trade openness and inflationary trends on industrial productivity in Nigeria.

The following hypotheses shall be tested in this study:

Ho₁: There is no significant long run relationship between foreign direct investments and industrial productivity in Nigeria.

Ho₂: Foreign Direct Investments do not have any significant impact on Industrial productivity and its individual components in Nigeria.

Ho₃: There is no causality relationship between foreign direct investments and industrial productivity in Nigeria.

This study will attempt to identify the trend of FDI inflows and the impact it has on industrial productivity in Nigeria.

The study will inform policy decisions and assist policy makers to ascertain if an enabling environment has been created to attract foreign direct investments and to appraise the effectiveness or otherwise of the policy on industrial productivity in Nigeria.

The study will also generate interests and debates on the need for and against foreign direct investments into Nigeria. Hence the study will also serve as reference materials for future and further works in this area. It will also provide basis for further comparative studies, on both the developed and less developed economies.

Finally, this study will add to the existing stock of knowledge on the subject matter, foreign direct investments and industrial productivity in Nigeria. It will also help to educate the general public, private sectors, economists and students alike.

Foreign direct investments and industrial productivity is a vast topic. Thus, the scope of this study is delineated, from 1981- 2015, a period of 35 (thirty five) years.

2.1 Conceptual Framework

The conceptual framework of this study is based on the variables under study.

2.1.1 Foreign Direct Investment (FDI)

Foreign direct investment (FDI) is a direct investment into production or business in a country by a company in another country, either by buying a company in the target country or by expanding operations of an existing business in that country (Danja, 2012).

Foreign direct investment has many forms. Broadly, foreign direct investment includes “mergers and acquisitions, building new facilities, reinvesting profits earned from overseas operations and intra-company loans” (Wikipedia, 2014). In a narrow sense, FDI refers just to building new facilities. As part of the national accounts of a country and in regard to the national income equation $Y = C + I + G + (X-M)$, the ‘I’ in the equation is investment plus foreign investment. FDI is therefore defined as the net inflows of investment (inflow minus outflow) to acquire a lasting management interest (10% or more of voting stock) in an enterprise operating in an economy other than that of the investor (World Bank, 2012). FDI is the sum of equity capital, other long-term capital and short time capital as shown in the BOP. FDI usually involves participation in management, joint-venture, transfer of technology and expertise. There are two forms of FDI “inward and outward”, resulting in a net FDI inflow (positive or negative) and “stock of foreign direct investments” which is the cumulative number for a given period. Direct investment excludes investment through purchase of shares (world fact book 2012). FDI is one example of international factor movements.

According to Alfaro *et al.*, (2012) there are different types of FDI. This includes:

1. **Horizontal FDI:** This arises when a firm duplicates its home country based activities at the same value change stage in a host country through FDI.
2. **Platform FDI:** This is a FDI from a source country into a destination to a third country.
3. **Vertical FDI:** This takes place when a firm through FDI moves upstream or downstream in different value chains, that is when firms perform value-adding activities stage by stage in a vertical fashion in a host country.

Horizontal FDI decreases international trade as the product of them is usually aimed at host country, the two other types generally act as a stimulus for it.

Having discussed the concept of foreign direct investments, it behooves of us now to review the nature and meaning of productivity.

2.1.2 The Nature and meaning of Productivity

There is no one universally acceptable definition of productivity. It has been defined by economists as the ratio of output to input in a given period of time. Put in another way, it is the amount of output produced by each unit of input.

Business managers, on the other hand, see productivity not only as a measure of efficiency but also connote effectiveness and performance of individual organizations. For them, productivity would incorporate quality of output, workmanship, adherence to standards, absence of complaints, customer satisfaction etc. (Udo-Aka, 1983).

To the administrator, productivity means organizational effectiveness while the industrial engineer sees productivity from the point of view of those factors which are more operational and quantifiable, work measure and performance standards. Thus, productivity can be computed for a firm, industrial group, the entire industrial sector or the economy as a whole. It measures the level of efficiency at which scarce resources are being utilized. Hence, according to (Anyanwu, 1999), the study of international trade and productivity involve the analysis of efficiency in the use of international trade flows in increasing productivity particularly at the industrial sector that is international trade induced industrial productivity. Higher or increasing productivity will therefore mean either getting more output with the same level of input or the same level of output with less input. The organization for economic cooperation and development, (OECD, 2013) defined productivity “as a ratio of a volume of input used in production”. While there is no disagreement on this general notion, a look at the productivity literature and its various applications reveals very quickly that there is neither a unique purpose for nor a single measure of productivity.

According to Ukeje, (1999), “productivity in its broad sense, is a measure of how efficient and effective resources are used as inputs to produce products and services needed by the society in the long run. It is the rate of flow of output when compared with rates of flow of resources used in producing the output of goods and services. In financial terms, productivity is the value of output divided by the cost of inputs used in a given period. The basic resource inputs consist of labor, capital and natural resources. Since resource inputs seldom grow much faster than population. Obviously the main source of increase of output per capita is through the growth in productivity.

There are basically two schools of thought on the concept and interpretations of productivity. The first school of thought sees productivity as the ability to accomplish some specified objectives irrespective of the quantum of resources. This is often referred to as output-centered productivity. To the other class of people, productivity will be synonymous with the ability to allocate resources judiciously and to avoid waste. This represents the cost-oriented concept of productivity. The latter class of adherents stress cost-consciousness and in most cases looks out for opportunities to insist on budget ceilings. The cost-oriented concept of productivity is a sharp contrast to the output-centered. Whereas the former stresses the need for economic use of resources, the latter places emphasis on the achievement of objectives. The premise upon which the output-centered argument is based is that conservation of resources amounts to creating a false economy especially when the basic objectives of an economy or establishment are not achieved.

Some other schools of thought see productivity from the point of labor. Labor productivity is commonly used to refer to the volume of goods and services produced per worker within some specified period of the year, month, week, day or hour. The adoption of this simplified concept do not take cognizance of the fact that labor productivity is a unit resulting from the interdependent contribution of labor and other factors of production. However, the practice of using labor especially direct labor as the most common factor in measuring productivity is due partly to the fact that labor inputs and costs can be ascertained and quantified more easily than those of other factors and partly due to a legacy of classical economists and Marxist thought which not only tend to regard labor as the sole source of value but also tend to regard all forms of indirect labor as “unproductive” labor. This study is adopting the cost-oriented concept of productivity because of its emphasis on the ability of an economy to allocate resources judiciously and to avoid waste. This implies efficiency in the use of international trade flows in increasing productivity at the industrial sector. other useful concepts associated with productivity includes:

Total factor productivity: This is the ratio of output to the aggregate measure of the inputs of all the factors of production. Theoretically, this is the true measure of productivity as it incorporates the contribution of all the factor inputs (Anyanwu, 1999).

Partial Productivity: This estimates the ratio of total output to a single input, usually labor. In most of economic discussion, productivity is taken to be synonymous with labor productivity. This is because it is a simpler concept to estimate and it is a rough measure of the effectiveness with which we use the most important factor of production-labor, (Anyanwu, 1999)

Measurement of productivity

Productivity can be measured by using either partial-factor productivity which is the ratio of output measured in specific units to any input (also measured in specific units), or total factor productivity (TFP) which is the ratio of total outputs to total inputs used in production.

Productivity can be measured in other real sectors of the economy ie the industrial, manufacturing and mining sectors.

The productivity of labor can be measured either as output per operator or output per man-hour expressed in monetary values (economic productivity) or in quantities (physical productivity). Because of the heterogeneity of output, it is more usually expressed in value terms which for the manufacturing sub-sector, is easily calculated from ex-factory prices of finished products, estimated value of semi-finished products and other works and services of an industrial nature (Anyanwu, 1999).

2.1.3 Determinants of Productivity in Nigeria.

According to Adenikinju (2005), several factors have conditioned productivity growth performance in Nigeria. These factors are discussed below under five broad dimensions.

(i) The Fruits of Knowledge

This relates primarily to the role of technology in development. Technology could be acquired or developed using at least three channels: research and development (R&D), technology transfer, and the adoption of new technology. We found Nigeria's activities in these three broad areas to be quite limited. Unfortunately, economic reform programs adopted in the past have given limited attention to the issues of technology. R&D remains one of the weakest links in Nigeria's development process, with very low spending by private firms and the government. While technology transfer policy in the past favored technology imports, the economic crisis of the 1980s has affected the continuous reliance on this policy. Technology adopted in the Nigerian manufacturing sector is quite old and antiquated. The impact of FDI is also restricted mainly to the oil sector. The weak linkage between the oil sector and the rest of the economy hinders any possible spillover effects from this type of FDI. Again, it was identified that the low levels of absorptive capacity in the economy limit the country's ability to effectively utilize the technological assets available to her.

(ii) The Results of Accumulation

It has equally been ascertained that the quality of human capital in Nigeria is not only low but has deteriorated over the years. This was worsened by the low public expenditure on education and the brain drain phenomenon which surged in the late 80s through the 90s. The low availability and poor quality of primary inputs, labour and capital also have an impact on the country's productivity performance. The fragmentation of internal markets also affects the efficiency of the labour market. Low private investment prevents firms from being able to replace ageing capital stock with new capital stock that embodies new and generally more efficient technology. Domestic producers identified the poor quality, unreliability and high cost of infrastructures as a major hindrance to their competitiveness. We found that domestic firms depend primarily on bank finance for working capital and investment. However, the inefficiency of the financial sector leaves them with high capital costs. In fact, the micro and small firms are almost completely left out of the formal credit market.

(iii) The Deeper Level

By all indicators, Nigeria can be classified as an open economy. However, while the country is open on the trade side, it cannot be said to be open on the financial side. There appears to be a weak transmission of trade openness indicators to total factor productivity. Factors responsible for this finding include the impact of depreciation on the naira value of imported inputs as well as the uncompetitiveness of domestic firms. The weak institutional environment also played a negative role on the business environment. The Index of Economic Freedom, published by the Heritage Foundation, put Nigeria among countries classified as "mostly unfree".

(iv) Other factors that matter

Business investment and operations are best conducted in an environment of stability with a minimum level of uncertainty. The Nigerian macroeconomic environment is highly volatile and characterized by uncertainties and high transaction costs. Policy reversals and policy changes are frequent. The seemingly hostile environment altered the preferences of economic agents for short-term investments rather than longer time more risky investments. Thus, the Nigerian corporate sector, including the financial sector, tend to be tilted and highly concentrated.

(v) Other Factors Affecting Productivity

Another factor identified as affecting productivity in Nigeria is the low competitiveness of the economy. The various reform policies implemented in the country have focused primarily on improving the price competitiveness. However, for the Nigerian economy to be competitive, price competitiveness is just one of the important considerations. Non-price competitiveness factors like timeliness, quality, marketing and distribution skills, reliability, after-sales services, technological innovation and the institutional structural environment are equally important. We also identified high macroeconomic volatilities in the economy as also playing a role in productivity trends.

Policies that Impact on Productivity

Various policies have played a role in productivity trend in Nigeria, some of these have a direct impact, and others an indirect impact on productivity. Some of these policies are briefly reviewed below.

A. Policies that Have a Direct Impact on Productivity

According to Adenikinju (2005), until the 1980s, Nigeria had neither a full-fledged Ministry of Science and Technology (S&T) nor a body of coherent national policy on S&T. While this has changed to some extent, S&T policies generally do not attract a high premium in the government policy agenda. Budgetary allocation to the sector is also quite low and direct government policy to support business R&D is also unavailable. The establishment by the government of institutions with productivity related objectives like the National Productivity Centre (NPC) the National Manpower Board (NMB) and training institutions like the Administrative Staff College of Nigeria (ASCON); the Centre for Management Development (CMD); the

Industrial Training Fund (ITF); the National Centre for Economic Management and Administration (NCEMA); the National Institute for Strategic Studies (NIPSS), etc should ordinarily enhance the productivity performance of the country; however, the operations of these institutions have been hampered by a lack of the budgetary support needed to enable them to fulfill their mandate.

The Nigerian educational policy was intended to encourage the development of science and technology through the 6-3-3-4 policy and the universities admission guideline, which recommends a 60:40 ratio in favor of science related courses. In addition, the number of tertiary institutions as well as their enrolment has increased significantly over the years. However, the implementation of these policies and guidelines has fallen short of expectations. The rapid increase in tertiary admissions did not translate to a corresponding increase in the quality of the graduates of these tertiary institutions.

Furthermore, in respect of product quality and standards, the Nigerian government set up two organizations - the Standard Organization of Nigeria (SON) and the National Agency on Food and Drug Administration (NAFDAC) to monitor the quality and safety of goods produced or sold on the Nigerian market. Rules concerning sanitary standards, testing and labeling are relatively well defined, but bureaucratic hurdles slow down the approval process.

B. Policies that have an Indirect Impact on Productivity

Again, according to Adenikinju(2005), there are also a number of policies that have an indirect impact on the productivity trend in Nigeria. High up in the list of these policies are the trade, exchange rates and industrial policies. Nigeria's trade policies over the years have fluctuated between protectionism and liberalism. In the pre-SAP era, trade policy was overwhelmingly protective.

However, the deliberate policy of maintaining an overvalued exchange rate and protective tariff created weak and sleepy firms that were unwilling to compete and innovate. In the post-adjustment period, trade policy has deemphasized protection and import substitution and favored export promotion. However, the effectiveness of these policies in achieving their objectives was hampered by the sharp decline in real income, which has been the dominant factor behind the poor manufacturing growth performance, and credibility problems relating to the sustainability of the policies.

Furthermore macroeconomic policies pursued for most of the period were anti-growth and fueled volatility in the economy. High and persistent fiscal imbalances translate into high public debt and since monetary policy was generally accommodating, it fueled inflationary rates. The shallow financial market adversely influences interest rates and risks also crowding out private sector credit in the face of the government's large borrowing requirements. The weakness of the capital market did not allow it to serve as a substitute for the weak financial sector. All of these work together to stifle much needed funds required by the real sector both for working capital and to finance investment.

The infrastructure policy which in the past precluded private sector participation resulted in inefficiency and a high cost of public provision of infrastructure services. However, current policy reforms in respect of the infrastructure sector have shifted the frontiers of private sector involvement in the management and financing of this sector. Nigerian and foreign investors are now operating in telecommunications, power, airways, and energy sectors among others.

The Land Use Act was also a major constraint to business investment in Nigeria. The Act, introduced in 1976, conferred land ownership on the state. However, the bureaucracy and costs associated with its operations was a major constraint to investment activities. Recently, the President promised to pursue the amendment of this controversial Act in order to ensure unfettered property development and the industrialization of the country.

2.1.4 Constraints to Productivity Growth in Nigeria

Among the most important constraints to productivity growth in Nigeria are, first, the absence of a consistent and long-term strategy for productivity improvement; secondly, the extensive dominance of the public sector in the economy, which stifles private sector initiatives and operations; thirdly, the very weak corporate linkages among the various sectors of the economy – business linkages facilitate innovation, higher productivity through specialization and flexibility in meeting customer needs, and enables economies of scale; fourthly, the weak linkage between the educational system and the requirements of the economy; and fifthly, the poor functioning of the labour and capital markets. In addition, productivity has been largely hindered by the inefficient state of the physical and social infrastructures. Government involvement in business R&D in the past was limited to tax incentives provided for R&D activities, without directly providing funds to support business R&D.

2.1.5 Possible Actions to Overcome Constraints to Productivity Growth in Nigeria.

These include, first, making the financial sector highly responsive to the needs of the real sector for investment. In respect of the labour market, it must be made more flexible. The government must fund business-related researches and provide more direct support for innovation. The intellectual property environment, including copyright and patents, must be strengthened to encourage private initiatives. The government's current effort to improve the macroeconomic environment and to re-orientate its budgetary allocation to favor social and

economic infrastructures is a step in the right direction. There is urgent need to address the observed technological weaknesses in the country. There is limited R&D activity and the capacity of the country to absorb technological innovation is quite weak. The government must seek ways to redress this limitation. A corollary of the above is the need to strengthen existing feeble institutional linkages across business firms, technical departments of universities or polytechnics, and government research laboratories.

2.2. Theoretical Framework On Foreign Direct Investments

A number of theories have been developed in FDI literature. These have subsequently been grouped into micro and macroeconomic approaches. The microeconomic theories focus on firm specific characteristics that influence the decision making of firms, for instance, market imperfections theories. Macroeconomic theories seek to analyze country characteristics that explain FDI flows within and across countries, that is, internalization and product cycle theories. FDI literature has also tended to review another set of theories in terms of FDI motives, that is, natural resource seeking, market seeking and efficiency seeking FDI. In explaining FDI theories, the aim is to identify determinants of FDI and how each of the factors impacts on FDI.

2.2.1 Market Imperfection Theories

Hymer (1976) developed the market imperfections theories which aim at explaining behavior of firms in non-perfect competitive environments, that is, oligopolistic or monopolistic environment. For firms to undertake FDI they need some unique advantage such as technology to compete abroad with local firms who already have location specific advantages. Considering the market disequilibrium hypotheses, FDI will be transitory as it acts as an equilibrating force among segmented markets, which will be eliminated through the re-establishing of equilibrium. The disequilibrium is usually found in factor markets i.e. labor markets where FDI flows from high labor cost countries to low labor cost countries. Cost of labor emerges as an important determinant of FDI.

Market power theories focus on structural imperfections i.e. deviations from purely market determined prices brought about by the existence of monopolistic or oligopolistic market characteristics.

2.2.2 Internationalization Theory

The internalization theory of Buckley and Casson (1976) supports the idea that there is a tendency in the economic system to generate sophisticated information and to transfer this information internationally in the form of FDI. There are times and cost savings associated with transferring information internally.

Internalization theories concentrate on identifying transactional market imperfections with a focus on the firm's choice to directly own the foreign assets. The internalization of markets across the boundaries of national markets creates MNCs. Knowledge and expertise is the important factors in imperfect markets. (Hymer: 1976, Dunning: 1977, Denisia: 2010)

2.2.3 Product Life –Cycle Hypothesis

Vernon's (1966) product life-cycle hypothesis postulate that firms engage in FDI at a particular stage in the life-cycle of products that they initially produced as innovations. Innovation and economies of scale are then used to explain the product cycle. The theory is production oriented, focusing on the production of industrial goods in manufacturing sectors. New products or initial production takes place in a domestic developed country because of high per capita income, easy access to markets and efficient communication process. Other countries are served initially through exports and as a customer base are established, then production would follow. The maturity stage takes place when production methods are standardized and markets are saturated in emerging and less developed countries.

2.2.4 Eclectic Theory

Eclectic theory attempts to answer the question of why a firm would want to produce in a foreign location instead of exporting or entering into a licensing arrangement with a local firm. According to Dunning (1988) three conditions must be satisfied for a firm to engage in FDI and these are ownership, firm specific assets or internalization and locational advantages which subsequently came to be known as the eclectic theory or OLI paradigm.

Ownership advantage entails technological advantages, size and access to raw materials as well as comparative advantage over other firms arising from the ownership of some intangible assets. Location advantage applies where expansion by a firm is best accomplished either at home or in a foreign country. Countries might have advantages such as size of local market, availability of resources, government incentives and other location variables. Voutilanen (2005:7) emphasizes the importance of superior production processes, cheap labor and nearness to customers as factors that make production by MNCs preferable in host countries. Focusing on internalization advantages, multinationals choose between accomplishing expansion internally or alternatively selling the rights to means of expansion to other firms.

The eclectic theory brings out a number of determinants of FDI and these include market size, cost of labor, government incentives, and access to raw materials (Hymer: 1976, Dunning: 1977, Denisia: 2010)

2.3 Empirical Reviews

The relationship between FDI inflows and industrial productivity is an under researched topic. Empirical investigations concentrated more on the impact of FDI on economic growth than on industrial productivity. The available and relevant literatures are reviewed below:

Thiam Hee Ng (2007), examined the linkage between foreign direct investments and productivity in fourteen sub Saharan economies namely Benin , Congo , Cote divoire , Gambia, Ghana, Malawi , Mauritius , Nigeria , Senegal Seychelles , Togo, Tanzania and Zambia. He used the Toda- Yamamoto version of the granger causality test to test if FDI inflows result in higher productivity growth . He found a limited evidence that FDI inflows contribute to higher total factor productivity growth. There was no evidence that FDI inflows lead to higher technical change but there was some evidence that FDI inflows lead to higher efficiency in three countries.

Dutse, Okwoli and kurfi (2011), opined that ,the inability to achieve appreciable level of productivity in the Nigerian manufacturing has generated questions on the effectiveness of current FDI policy approach in facilitating effective spillover. They made attempts in their study to depart from the earlier FDI policy perspective that considers technology as a public good that can normally be transferred to the host economy. Accordingly they argued that empirical evidences exist which indicate that significant technology spillover is most likely to occur among subsidiary firms that are technologically active as well as indigenous firms with absorptive capability while those that are not active are unlikely to do so. In providing a new approach, a policy priority framework for targeting technologically active firms is recommended which basically involve creating favorable condition for knowledge exchange, promoting selected technologies & products, supporting technological capabilities of active indigenous firms, and improvement of technical education of potential workforce. This is will encourage MNCs to transfer more valuable technologies to subsidiaries in Nigeria and also increase domestic firms' ability to absorb superior technology from MNCs

Nevide Seville Tuluca and Dogun (2014), reviewed the impact of Foreign Direct Investments on SME's development and suggests that many of the empirical estimates of productivity spillover from FDI to domestic firms in economies are biased. Foreign Direct Investment (FDI) is considered, in most countries, to be an important component of their development strategy, and policies are accordingly designed to stimulate inward flows. The spread of productivity spillovers is thus a matter of externalities being transmitted from established foreign producers to domestic ones. FDI presence may also improve the infrastructure, quality of labor force and R&D activities of domestic firms, which would have long term positive but would not show up in productivity measures. In transition economies, the regulatory environment might improve in response to the FDI presence.

2.4A critique OF related works On Foreign Direct Investments and industrial productivity in Nigeria and a consequent research gap

The relationship between foreign direct investments and industrial productivity has been reviewed in the immediate past section. Apparently ,there is a dearth of related studies as none of them have been able to spell out in clear terms whether low productivity in Nigeria can be attributed to FDI inflows or to so say with certainty that the low level of industrial productivity currently being experienced in Nigeria is as a result Inadequate FDI inflows. The inability to be clear in this area constitute a serious gap. To this end, one of the main thrusts of this study is to take an objective view (or spell out in clear terms) regarding the actual role which FDI inflows have played in industrial productivity in Nigeria.

The conclusion is therefore trite that existing state of research has not adequately reviewed this topical issue as it affects Nigeria. Thus, providing further impetus for this study.

3.0 Research Methodology

3.1 Method overview

In order to realize the objective of this paper, a least square as well as a vector author regression analysis are adopted to understand the behavior of the time series data before suitable model can be developed. The operationalization and analytical procedure is based on the following relationship model:

3.2 Specification of Models

We specify the relationship between industrial productivity and foreign Direct investments as follows:

$$IPI = a_0 + a_1 FDI/GDP + a_2 X + u_i$$

$$MAPI = a_0 + a_1 FDI/GDP + a_2 X + u_i$$

$$MIPI = a_0 + a_1 FDI/GDP + a_2 X + u_i$$

Where IPI, MAPI and MIPI are the Industrial productivity components or indicators , FDI/GDP is Foreign Direct Investments expressed as a function of Gross Domestic Product and X are the vector of other control variables that affect the level of industrial productivity. Here we intend to use GDP Per Capita to control for the level of economic development, EXPT/GDP (Export as a function of gross domestic product) and IMPT/GDP (Import as a function of Gross Domestic Product) for international trading positions. Other control variables will include Inflation (INFL) and Degree of trade openness(OPN).

Foreign direct investments inflows for the period 1981-2015, herein represented by the symbol FDI/GDP, are regressed on components of Industrial productivity indicators for the corresponding period.

Other variables used in this study are hereby represented as follows:

EXPT/GDP_t=Ratio of export trades to GDP in year, t.

IMPT/GDP_t=Ratio of Import trades to GDP in year, t.

We assume a possibility that the data could be affected by other exogenous variables over the period and therefore we control such fluctuations by incorporating inflationary trends, Degree of trade openness (**DOPN**), and GDP Per capita into the model equation

INFL =Inflationary trends in year, t

OPN = Degree of trade openness in year, t.

GDP_{PCt} = Gross Domestic Product per capita in year, t.

t = time and **ε**=The error term assumed to be normally and independently distributed with zero mean and constant variance, which captures all other explanatory variables which influence Industrial productivity but are not captured in the model

3.2.1 Antecedents to the present study

This work drew some inspiration from the earlier works of Adenikinju (2005), where she examined the determinants of industrial productivity in Nigeria. He posit that foreign Direct Investment (FDI) is an important harbinger of technology. However, Nigeria has not really been a favored country in terms of non-oil FDI inflows. As at 2015, the ratio of FDI to economic growth stood at 0.643. The resurgence of FDI in recent years has gone to the oil sector, which has very limited linkage with the economy and thus can only contribute marginally to productivity growth in the economy in general or in the manufacturing sector in particular.

it is over 12 (twelve) years now, that the above research was conducted. It has become expedient that we undertake a fresh study to ascertain the current trends.

3.2.2 Model formulation

Industrial productivity index (represented by IPI) is made up of two main sectors, namely the manufacturing productivity index (represented by MAPI) and the mining sector productivity index (represented by MIPI).

For industrial sector productivity (IPI) ,the model is represented thus .

Model 1:

In the short run

$$IPI=f(FDIGDP + EXPTGDP + IMPTGDP +GDPPC +NFL +OPN) \dots\dots 3.1$$

In the long run

$$IPI = f(FDIGDP + EXPTGDP + IMPTGDP +GDPPC +NFL +OPN +IPI_{(t-1)}+IPI_{(t-2)}) \dots\dots \text{Eq.3.2}$$

Model II

For manufacturing sector productivity (MAPI) ,the model is represented thus

In the short run:

$$MAPI = f(FDIGDP + EXPTGDP + IMPTGDP +GDPPC +NFL +OPN) \text{Equation} \dots\dots 3.3$$

In the long run:

$$MAPI = f(FDIGDP + EXPTGDP + IMPTGDP +GDPPC +NFL +OPN +MAPI_{(t-1)}+MAPI_{(t-2)}) \dots \text{Equation} 3.4$$

Model 111

For mining sector productivity (MIPI) ,the model is represented thus

In the short run:

$$MIPI = f(FDIGDP + EXPTGDP + IMPTGDP +GDPPC +NFL +OPN) \dots\dots \text{Equation} 3.5$$

In the long run:

$$MIPI = f(FDIGDP + EXPTGDP + IMPTGDP +GDPPC +NFL +OPN +MIPI_{(t-1)}+MIPI_{(t-2)}) \dots \text{Equation} 3.6$$

3.6.3 Justification of the chosen variables

Our choice of the under listed variables is borne out of the fact that, they were adjudged as indicators of industrial Performance in some of the reviewed relevant literatures .

Industrial Productivity:

Industrial productivity is an average measure of the efficiency of production. It can be expressed as the ratio of output to inputs used in the production process, i.e. output per unit of input (Udo-Aka, 1983). For purpose of this study, industrial productively is split into three component parts namely **industrial, manufacturing and mining** sectors productivity

Productivity is considered a key source of economic growth and competitiveness and, as such, is basic statistical information for many international comparisons and country performance assessments. There are different measures of productivity and the choice among them depends either on the purpose of the productivity measurement and/or data availability.(Wikipedia).

Foreign direct investment:

Foreign direct investment (FDI) is a direct investment into production or business in a country by a company in another country, either by buying a company in the target country or by expanding operations of an existing business in that country. FDI has many forms. Broadly, FDI includes “mergers and acquisitions, building new facilities, reinvesting profits earned from overseas operations and intra-company loans” (Wikipedia)

Exports

The term export means shipping the goods and services out of the port of a country. The seller of such goods and services is referred to as an "exporter" and is based in the country of export whereas the overseas based buyer is referred to as an "importer". In International Trade, "exports" refers to selling goods and services produced in the home country to other markets. In this study, export is expressed as a function of economic growth(GDP)

Import

An import is a good brought into a jurisdiction, especially across a national border, from an external source. The party bringing in the good is called an importer. An import in the receiving country is an export from the sending country. Importation and exportation are the defining financial transactions of international trade.(Wikipedia). Import and export trades are said to be veritable tools for FDI transmission. In this study, import is expressed as a function of economic growth(GDP)

Degree of Trade openness

Openness to trade (measured as exports/GDP in this study), has been used extensively in economic growth literature as a major determinant of growth performance and productivity.(Weil, 2005)

Inflation

In economics, inflation is a sustained increase in the general price level of goods and services in an economy over a period of time. When the price level rises, each unit of currency buys fewer goods and services; consequently, inflation reflects a reduction in the purchasing power per unit of money – a loss of real value in the medium of exchange and unit of account within the economy. Inflation affects economies in various positive and negative ways. (Wikipedia)

Gross Domestic product per capita

This concept represents a further refinement of economic growth .Measured in this way an economy is said to have witnessed economic growth if there has been an increase in per capita output at constant prices overtime, the per capita concept connoting that the real increase in output is divided by the number of people among whom it is shared.

3.6.4. Expected Results or a Priori Expectations

For the sake of clarity and in line with above justification of chosen variables, we hereby state precisely, the a priori expectations of this research: while the coefficient of inflationary trends are expected to have a negative relationship, that of Foreign direct investment, export and import trades, degree of trade openness and Gross Domestic product per capita are expected to maintain a positive relationship with industrial productivity in Nigeria.

4.2.1 Data Estimation

4.2.1.1 Unit Root Tests

This is carried out using Augmented Dickey Fuller Test to determine whether the data set is stationary or not and the order of integration.

Table 4.2: Unit Root Test

Variable	Level	First Difference	Second Difference	Level of Integration	Prob.	Test Statistics @1%	Test statistics @5%	Test Statistics @10%
MAPI	-	First Diff	-	-5.46		-3.65	-2.95	-2.62
MIPI	-	First Diff	-	-5.26		-3.65	-2.95	-2.62
IPI	-	First Diff	-	-4.99		-3.65	-2.95	-2.62
FDIGDP	-	First Diff	-	-7.74		-3.66	-2.96	-2.62
OPN	-	First Diff	-	-5.34		-3.65	-2.95	-2.62
GDPPC	-	First Diff	-	-5.63		-3.66	-2.95	-2.62
IMPTGDP	-	First Diff	-	-10.28		-3.65	-2.95	-2.62
EXPTGDP	-	First Diff	-	-5.72		-3.65	-2.96	-2.62

Source: E-Views version 7 statistical package

From tables 4.2 above, we observed that all the variables turned stationary at "first difference".

4.3 . Hypotheses Testing

Ho₁: There is no significant long run relationship between foreign Direct investments and the level of industrial productivity in Nigeria.

Ho₂: Foreign direct investments do not have any significant long run relationship with the disaggregated components of industrial productivity Nigeria.

Ho₃: There is no causality relationship between foreign direct investments and the level of industrial productivity in Nigeria.

4.3.1. The Influence of Foreign Direct Investments on Industrial Productivity in Nigeria.

Test of Hypothesis 1

Ho₁: There is no significant long run relationship between foreign direct investments and the level of industrial productivity in Nigeria.

Table 4.3: Summary of the Global Statistics (Ordinary least Square (OLS) and Vector Autoregressive (VAR) Models (1981–2015).

Test Statistics	IPI		MAPI		MIPI	
	Model 1 OLS	Model2 VAR	Model 1 OLS	Model 2 VAR	Model 1 OLS	Model2 VAR
R-Square	0.507784	0.778101	0.520087	0.744248	0.722356	0.895728
Adjusted R-Square	0.398402	0.704134	0.413439	0.659045	0.660658	0.860970
S.E of Regression	27.67497	19.35721	20.04725	15.50089	12.14431	7.627807
Sum Sqrd Residual	20679.41	8992.840	10851.09	5766.659	3982.073	1396.403
Log Likelihood	-157.2230	-139.356	-146.2601	-132.021	-129.2183	-108.6199
Durbin Watson Stat	0.624908	1.682391	0.773821	1.659681	0.871373	1.959648
Mean Dep. Variance	251.5794	252.7313	125.0000	125.2303	126.5735	127.4939
SD Dep. Variance	35.68075	35.587	26.17570	26.54655	20.84749	20.45718
Akaike.Inf Criterion	9.660	8.991008	9.015302	8.546672	8.012839	7.128479
Schwarz Criterion	9.97	9.399146	9.329553	8.954811	8.327090	7.536617
F-Statistics	4.64	10.51965	4.876695	8.731755	11.70782	25.77051
Prob-(F-Statistics)	0.002	0.000003	0.001712	0.000016	0.0000002	0.000001

Source: E-view statistical package version 7.0

Ordinary Least Square Model : IPI, MAPI and MIPI in the Short run.

IPI:

The model posted an R-Square of 50.77%, Adjusted R-Square 39.84 %, Standard Error 27.68, Log Likelihood-157.22, Akaike information criterion 9.66 and Schwarz criterion of 9.97.

MAPI:

The model posted an R-Square of 52 %, Adjusted R-Square 41.34 %, Standard Error 20.04, Log Likelihood-146.26, Akaike information criterion 9.015 and Schwarz criterion of 9.33.

MIPI:

The model posted an R-Square of 72.24%, Adjusted R-Square 66.06%, Standard Error 12.14, Log Likelihood-3982.073, Akaike information criterion 8.012 and Schwarz criterion of 8.38.

4.3.2. Test of Model Significance: In order to confirm the specification status of our model, we employ the analysis of variance or ANOVA, for short.

4.3.3 Decision Rule in the Short Run for IPI, MAPI AND MIPI.

Employing the E-views software, since F-ratio calculated (4.64, 4.87 and 11.71) respectively for IPI, MAPI and MIPI are greater than F-ratio critical (3.50,2.43), at both 1% and 5% levels of significance respectively. We conclude thus; that foreign direct investments have a significant relationship with the level of industrial productivity in Nigeria in the short run.

4.3.4 Vector Auto Regression Model : Industrial Productivity (IPI), Manufacturing Sector Productivity , (MAPI) and Mining Sector Productivity (MIPI) in the long run.

For IPI , the model posted an R-Square of 727.81%, Adjusted R-Square 70.41%, Log Likelihood-139.35, Akaike information criterion 8.99 and Schwarz criterion of 9.39.

For MAPI, the model posted an R-Square of 74.42%, Adjusted R-Square 86.09%, Log Likelihood-108.62, Akaike information criterion 8.54 and Schwarz criterion of 8.95.

For MIPI, the model posted an R-Square of 89.57%, Adjusted R-Square 86.09%, Log Likelihood-108.62, Akaike information criterion 7.13 and Schwarz criterion of 7.54. (See table 4.3 above.).

4.3.5. Decision rule in the long run for IPI, MAPI AND MIPI

Employing the E-views software, since F-ratio calculated (10.52, 8.73 and 25.77) respectively for IPI, MAPI and MIPI are greater than F-ratio critical (3.26, 2.31), at both 1% and 5% levels of significance respectively. Thus, we reject H_{01} and conclude that foreign direct investments have a significant long run relationship with the level of industrial productivity in Nigeria.

4.3.6. Test of Hypothesis 2

H_{02} : Industrial productivity indicators individually do not have any significant long run relationship with the level of foreign direct investments in Nigeria.

Having tested for the model significance , we go a step further to ascertain how foreign direct investments have contributed to the total variation in the level of industrial productivity in Nigeria. This is achieved through the student t-test. We refer to the regression result in Table 4.5 below:

4.3.6.1 Industrial Productivity (IPI) and Foreign Direct Investments

Table 4.4: T-Statistics Table- For IPI in the short run

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	189.6889	14.99496	12.65018	0.0000
FDI/GDP	3.219119	2.760881	1.165975	0.2538
EXPT/GDP	3.115465	1.326066	2.349404	0.0264
IMPT/GDP	3.755832	1.832298	2.049793	0.0502
GDPPC	-4.77E-05	0.005988	-0.007959	0.9937
INFL	-0.242728	0.357656	-0.678664	0.5031
OPN	-1.044108	0.610943	-1.709011	0.0989

Source: E-views statistical package version 7.0

From Table 4.5, while export has a significant relationship with industrial productivity in Nigeria at 5% Alpha level in the short run. The other variables i.e. FDI , Imports , GDP per capita, Inflation and Degree of trade openness proved not to have a significant relationship with the level of industrial productivity in Nigeria.

Note: F-ratio tabulated DF= (6, 29); 1% = 2.76, 5% =2.04,; T-ratio DF (29) and N.S =”Not Significant”. The resulting estimated model in the short run is given as:

$$IPI = 189.69 + 3.22FDI/GDP + 3.12 EXPT/GDP + 3.76IMPTGDP - 4.77E-05GDPPC - 0.24INFL - 1.044OPN \dots \dots \dots \text{Equation 4.1}$$

From equation 4.1 above, the Beta coefficient of FDI/GDP, EXPT/GDP, and IMPT/GDP are 3.22, 3.12, and 3.76 respectively. This implies that while FDI/GDP, EXPT/GDP, and IMPT/GDP have positive relationship with IPI, GDPPC, INFL and OPN have negative relationship with IPI in the short run. The implication of this result is that a 1% increase in foreign direct investments will lead to a 3.22 increase in industrial productivity in Nigeria ;etc, etc; all things being equal.

Next, is to ascertain the impact of foreign direct investments on industrial productivity in Nigeria in the long run.

Table 4.5 : T-Statistics Table- FDI/GDP and IPI in the Long Run

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	78.75559	27.99876	2.812825	0.0096
FDI/GDP	2.120894	2.131557	0.994997	0.3297
EXPT/GDP	1.618273	0.994829	1.626685	0.1169
IMPT/GDP	1.478768	1.359392	1.087816	0.2875
GDPPC	0.000345	0.004247	0.081354	0.9358
INFL	-0.178596	0.255888	-0.697946	0.4919
OPN	-0.539170	0.438922	-1.228395	0.2312
IPI(-1)	0.913329	0.188663	4.841066	0.0001
IPI(-2)	-0.333764	0.192594	-1.732991	0.0959

Source: E-views statistical package version 7.0

From the above table, only the lagged value of IPI, taken as a variable was found to be positively significant in the long run. The resulting estimated model in the long run is thus:

$$\text{IPI} = 78.8 + 2.12 \text{ FDI/GDP} + 1.61 \text{ EXPT/GDP} + 1.48 \text{ IMPT/GDP} + 0.0003 \text{ GDPPC} - 0.18 \text{ INFL} - 0.54 \text{ OPN} + 0.91 \text{ IPI}(t-1) - 0.33 \text{ IPI}(t-2) \dots \text{Eq.4.2}$$

From equation 4.2 above, the Beta coefficient of FDI/GDP, EXPT/GDP, IMPT/GDP, GDPPC, INFL, OPN, IPI (t-1), and IPI (t-2) are 2.12, 1.61, 1.48, 0.0003, -0.18, -0.54, 0.91 and 0.33 respectively. This implies that, while there is a positive relationship between FDI/GDP, EXPT/GDP, IMPT/GDP, GDPPC, IPI(t-1), IPI(t-2) and IPI, there exists a negative relationship between INFL, OPN and IPI in the long run. The implication of this result is that a 1% increase in foreign direct investment will lead to 2.12 Industrial productivity (IPI) in the long run;etc, etc; all things being equal.

Next is to consider the relationship between foreign direct investments and manufacturing sector productivity in Nigeria.

4.3.6.2 Manufacturing Sector Productivity (MAPI) and Foreign Direct Investments.

Table 4.6: T-Statistics Table- For MAPI in the short run

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	102.2243	10.86208	9.411113	0.0000
FDI/GDP	0.662976	1.999932	0.331499	0.7428
EXPT/GDP	2.228355	0.960578	2.319806	0.0282
IMPT/GDP	3.000295	1.327284	2.260477	0.0321
GDPPC	-0.008763	0.004337	-2.020508	0.0534
INFL	0.091076	0.259079	0.351535	0.7279
OPN	-1.138041	0.442556	-2.571519	0.0160

Source: E-views statistical package version 7.0

From Table 4.6 above, while export, import and degree of trade openness have a significant relationship with manufacturing sector productivity in Nigeria at 5% Alpha level in the short run. The other variables i.e. FDI, GDP per capita and Inflation proved not to have a significant relationship with the level of manufacturing sector productivity in Nigeria in Nigeria.

Note: F-ratio tabulated DF= (6, 29); 1% = 2.76.26, 5% = 2.04, T-ratio DF (29) and N.S = "Not Significant". The resulting estimated model in the short run is given as:

$$\text{MAPI} = 102.22 + 0.66 \text{ FDI/GDP} + 2.22 \text{ EXPT/GDP} + 3.0 \text{ IMPT/GDP} - 0.008 \text{ GDPPC} + 0.09 \text{ INFL} - 1.13 \text{ OPN} \dots \text{Eq. 4.3}$$

From equation 4.3 above, the Beta coefficient of FDI/GDP, EXPT/GDP, and GDPPC, INFL and OPN are 0.66, 2.22, and 3.0, 0.008, 0.09 and -1.13 respectively. This implies that while FDI/GDP, EXPT/GDP, IMPT/GDP and INFL have positive relationship with MAPI, GDPPC and OPN have negative relationship with MAPI in the short run. The implication of this result is that a 1% increase in foreign direct investments will lead to a 0.66 increase in Manufacturing productivity in Nigeria;etc, etc; all things being equal.

Next, is to ascertain the impact of foreign direct investments on manufacturing sector productivity in Nigeria in the long run.

Table 4.7 : T-Statistics Table- FDI/GDP and MAPI in the Long Run

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	44.92714	19.06630	2.356364	0.0270
FDI/GDP	1.546927	1.725124	0.896705	0.3788
EXPT/GDP	1.038620	0.821225	1.264719	0.2181
IMPT/GDP	1.502235	1.097298	1.369031	0.1837
GDPPC	-0.003473	0.003733	-0.930163	0.3615
INFL	-0.129328	0.207496	-0.623282	0.5390
OPN	-0.586821	0.371685	-1.578814	0.1275
MAPI(-1)	0.859886	0.204318	4.208568	0.0003
MAPI (-2)	-0.303544	0.211703	-1.433817	0.1645

Source: E-views statistical package version 7.0

From the above table, only the lagged value of MAPI at the first lag, taken as an explanatory variable was found to be positively significant in the long run. The resulting estimated model in the long run is thus:

$$\text{MAPI} = 44.93 + 1.55\text{FDI/GDP} + 1.03\text{EXPT/GDP} + 1.50\text{IMPT/GDP} - 0.003\text{GDPPC} - 0.13\text{INFL} - 0.59\text{OPN} + 0.85\text{MAPI}_{(t-1)} - 0.31\text{MAPI}_{(t-2)} \dots \text{Eq.4.4}$$

From equation 4.4 above, the Beta coefficient of FDI/GDP, EXPT/GDP, IMPT/GDP, GDPPC, INFL, OPN, MAPI_(t-1), and MAPI_(t-2) are 1.55, 1.03, 1.5, -0.003, -0.13, -0.59, 0.85 and 0.31 respectively. This implies that, while there is a positive relationship between FDI/GDP, EXPT/GDP, IMPT/GDP, OPN and MAPI_(t-1) and MAPI, there exists a negative relationship between GDPPC, INFL, OPN, MAPI_(t-2), and MAPI in the long run. The implication of this result is that a 1% increase in foreign direct investment will lead to about 1.55 increment in manufacturing sector productivity (MAPI) in Nigeria in the long run;etc, etc; all things being equal.

Next is to consider the relationship between foreign direct investments and Mining sector productivity in Nigeria.

4.2.6.3 Mining Sector Productivity (MIPI) and Foreign Direct Investments

Table 4.8:T-Statistics Table- Foreign Direct Investments(FDI) and Mining Sector productivity (MIPI) in the short run.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	87.40788	6.580077	13.28372	0.0000
FDI/GDP	2.560592	1.211527	2.113524	0.0439
EXPT/GDP	0.888994	0.581903	1.527734	0.1382
IMPT/GDP	0.756559	0.804048	0.940938	0.3551
GDPPC	0.008730	0.002627	3.322649	0.0026
INFL	-0.334099	0.156946	-2.128747	0.0425
OPN	0.093563	0.268093	0.348992	0.7298

Source: E-views statistical package version 7.0

From Table 4.8 above, while Foreign direct investments ,GDP per capita and inflation have a significant relationship with mining sector productivity in Nigeria at 5% Alpha level in the short run. The other variables i.e. export, import and degree of trade openness proved not to have a significant relationship with the level of mining sector productivity in Nigeria.

Note: F-ratio tabulated DF= (6, 29); 1% = 2.72, 5% =2.04, T-ratio DF (29) and N.S =”Not Significant”. The resulting estimated model in the short run is given as:

$$\text{MIPI} = 87.41 + 2.56\text{FDI/GDP} + 0.89\text{EXPT/GDP} + 0.76\text{IMPT/GDP} + 0.009\text{GDPPC} - 0.33\text{INFL} + 0.09\text{OPN} \dots \text{Equation 4.5}$$

From equation 4.5 above, the Beta coefficient of FDI/GDP, EXPT/GDP, IMPT/GDP, GDPPC, INFL and OPN are 2.56, 0.89, 0.76, 0.009, -0.33 and 0.09 respectively. This implies that while FDI/GDP, EXPT/GDP, IMPT/GDP, GDPPC and OPN, all have positive relationship with MIPI, INFL has a negative relationship with MIPI in the short run. The implication of this result is that a 1% increase in foreign direct investments will lead to a 2.56 increase in Mining sector productivity in Nigeria ; ...tc, etc; all things being equal.

Next, is to ascertain the impact of foreign direct investments on mining sector productivity in Nigeria in the long run.

Table 4.9 : T-Statistics Table- FDI/GDP and MIPI in the Long Run

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	28.03434	10.68878	2.622783	0.0149
FDI/GDP	0.239691	0.844971	0.283668	0.7791
EXPT/GDP	0.594871	0.374525	1.588336	0.1253
IMPT/GDP	-0.021501	0.519112	-0.041419	0.9673
GDPPC	0.002761	0.001931	1.429937	0.1656
INFL	-0.002196	0.110636	-0.019846	0.9843
OPN	-9.32E-05	0.170429	-0.000547	0.9996
MIPI(-1)	0.888395	0.179842	4.939854	0.0000
MIPI(-2)	-0.214633	0.167321	-1.282759	0.2118

Source: E-views statistical package version 7.0

From the above table, only the lagged value of MIPI at the first lag, taken as an explanatory variable was found to be positively significant in the long run. The resulting estimated model in the long run is thus:

$$\text{MIPI} = 28.03 + 0.24\text{FDI/GDP} + 0.59\text{EXPT/GDP} - 0.02\text{IMPT/GDP} + 0.002\text{GDPPC} - 0.002\text{INFL} - 9.32\text{E} - 0.5\text{OPN} + 0.88 \text{MIPI}_{(t-1)} - 0.21\text{MIPI}_{(t-2)} \text{ Eq.4.6}$$

From equation 4.6 above, the Beta coefficient of FDI/GDP, EXPT/GDP, IMPT/GDP, GDPPC, INFL, OPN, MIPI_(t-1), and MIPI_(t-2) are 0.24, 0.59, -0.02, 0.002, -0.002, -9.32E-0.5, 0.88 and 0.21 respectively. . This implies that, while there is a positive relationship between FDI/GDP, EXPT/GDP, GDPPC and MIPI(t-1) and MIPI, there exists a negative relationship between IMPT/GDP, INFL, OPN and MIPI(t-2) MIPI in the long run. The implication of this result is that a 1% increase in foreign direct investment will lead to about 0.24 increment in Mining sector productivity (MIPI) in Nigeria in the long run;etc, etc; all things being equal. Next is to run a co-integration test to ascertain the level of co integration

4.4 Co- Integration Tests

The tests below strongly reject the null hypothesis of no co integration .i.e. no long run relationship between the dependent and the independent variables in favor of at least three(3),co-integrating vectors.

Table 4.10 : Johansen Co-integration tests

Model	Number of Co-integrating Equations (Trace Test)	Number of Co-integrating Equations(Max-Eigen Value)	Nature of Equilibrium
Industrial Productive Index(IPI) and foreign Direct Investments	4	3	Long-run
Manufacturing sector Productive index (MAPI) and foreign Direct Investments	4	3	Long-run
Mining sector Productive index (MIPI) and foreign Direct Investments	4	3	Long-run

Source: E views statistical package version 7

4.5 Granger causality test on FDI and Industrial productivity in Nigeria.

Null Hypothesis:	Obs	F-Statistic	Prob.
MAPI does not Granger Cause IPI	33	0.15046	0.8610
IPI does not Granger Cause MAPI		0.69830	0.5059
MIPI does not Granger Cause IPI	33	0.15294	0.8589
IPI does not Granger Cause MIPI		0.27367	0.7626
FDI/GDP does not Granger Cause IPI	31	1.40169	0.2642
IPI does not Granger Cause FDI/GDP		1.61997	0.2172
MIPI does not Granger Cause MAPI	33	0.70330	0.5035
MAPI does not Granger Cause MIPI		0.27193	0.7639
FDIGDP does not Granger Cause MAPI	31	1.02300	0.3735
MAPI does not Granger Cause FDI/GDP		5.37031	0.0112
FDIGDP does not Granger Cause MIPI	31	0.50802	0.6075
MIPI does not Granger Cause FDI/GDP		0.20609	0.8151

Source: E views statistical package version 7

From table 4.10 above, It was observed that the manufacturing sector productivity granger causes Foreign Direct Investments but the reverse was not the case.

4.6 DISCUSSION OF RESULTS

In our current study, it was ascertained that industrial productivity in Nigeria is not FDI driven. However, upon disaggregation into its component sectors i.e. the industrial, manufacturing and mining sectors' productivity profiles, it was confirmed that Foreign direct investments have a positive and significant relationship with mining sector productivity in Nigeria at 5% Alpha level in the short run. This did not come as a surprise seeing that the oil industries belong to this sector. The impact of FDI is mostly restricted to the oil sector. The weak linkage between the oil sector and the rest of the economy hinders any possible spillover effects from FDI into the larger economy.

Our research findings corroborates the earlier works of Adenikinju(2005) where she posit that Foreign Direct Investment (FDI) is an important harbinger of technology. but that, Nigeria has not really been a favored country in terms of non-oil FDI inflows. The resurgence of FDI in recent years has gone to the oil sector, which has very limited linkage with the economy and thus can only contribute marginally to productivity growth in the economy in general or in the manufacturing sector in particular.

4.7.Application of Research Findings and Contribution to Knowledge

Ordinarily, foreign direct investments are expected to exert wide and significant influence on industrial productivity in Nigeria. Hence, its application rests mainly on the contributions of the various findings of the study and how it could help in the formulation and implementation of economic policies. The impact of such policies will be appreciated from the standpoint of how rapidly and effectively it fosters, innovates or modernizes industrial productivity in Nigeria. Thus, this study produced the following prediction models, both in the short and long runs respectively on the relationship between foreign Direct investments and industrial productivity in Nigeria.

4.7.1. Prediction Models

The relationship between industrial productivity and Foreign direct investments in Nigeria gave rise to equations 4.1 to 4.6 as highlighted in the relevant sections above. Thus, one of the major contributions of this study, is that it is possible from these set of models to predict the level of industrial productivity in Nigeria (both in the short and long runs), given that the levels of foreign direct investments and the other variables known. It is expected that; results obtained in this study will provide better and more robust estimates of the relationship between foreign direct investments and industrial productivity in Nigeria.

5.0 Summary, Conclusion and Recommendations

5.1 Summary

This section is concerned with the summary of main findings, conclusions drawn therein and necessary recommendations based on the research findings. The main findings are itemized below as follows:

The level of industrial productivity in Nigeria is expected to bear a significant relationship with the level foreign direct investments inflows in both in the short and long runs and so desires a closer watch for improved performance.

Industrial Productivity and Foreign Direct Investments In Nigeria.

Exports proved to have a significant relationship with industrial productivity in Nigeria at 5% Alpha level in the short run. The other variables i.e. Foreign Direct Investments, Imports, GDP per capita, Inflation and Degree of trade openness did not have a significant relationship with the level of industrial productivity in Nigeria. In the long run, FDI still did not have a significant relationship with the level of Industrial productivity in Nigeria, it was only the lagged value of IPI, taken as a variable was found to be positively significant.

Manufacturing Sector Productivity and Foreign Direct Investments In Nigeria.

Exports, imports and degree of trade openness have a significant relationship with manufacturing sector productivity in Nigeria at 5% Alpha level in the short run. The other variables i.e. Foreign Direct Investments, GDP per capita and Inflation proved not to have a significant relationship with the level of manufacturing sector productivity in Nigeria in Nigeria. In the long run it was only the lagged value of MAPI at the first lag, taken as an explanatory variable was found to be positively significant in the long run with manufacturing sector productivity in Nigeria.

Mining Sector Productivity and Foreign Direct Investments In Nigeria.

Foreign direct investments, GDP per capita and inflation have a significant relationship with mining sector productivity in Nigeria at 5% Alpha level in the short run. The other variables i.e. export, import and degree of trade openness proved not to have a significant relationship with the level of mining sector productivity in Nigeria.

In the long run it was, only the lagged value of Mining sector productivity (MIPI) at the first lag, taken as an explanatory variable that was found to be positively significant with mining sector productivity in Nigeria.

5.2 Conclusion

On the basis our findings, the study therefore concludes that industrial productivity in Nigeria is not FDI driven. However, upon a disaggregation into the industrial, manufacturing and mining sectors' productivity profiles, it was ascertained that Foreign direct investments have a positive and significant relationship with mining sector productivity in Nigeria at 5% Alpha level in the short run. This did not come as a surprise seeing that the oil industries belong to this sector. The impact of FDI is mostly restricted to the oil sector. The weak linkage between the oil sector and the rest of the economy hinders any possible spillover effects from FDI into the larger economy.

Presently, the Nigerian economy relies heavily on crude oil export revenues; representing about 90% of total earnings and on an average of 70% of government revenues in annual budgets.

5.3 Recommendations

Based on the above findings and conclusions, the following policy options are recommended.

It could be seen that the over reliance on foreign direct investments as a source of economic growth and industrial productivity in Nigeria has not been justified. While we reiterate that, there might be need for foreign direct investments, we should not be totally dependent on it. As it were, FDI are only attracted to a region with favorable operating environment. It is not by coercion or compulsion. Thus, government and policy formulators in Nigeria, need to enact some investor friendly policies that will encourage, promote and attract more foreign direct investments and to provide a conducive and enabling environment. Subsequent FDI inflows should be geared towards the manufacturing sector. The essence is to improve on the level of productivity in that sector.

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