Sectoral Analysis of Foreign Direct Investments and Balance Of Payments in Nigeria

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Abstract

This study examined the effect of Foreign Direct Investments flow in agriculture, manufacturing and processing, and mining and quarrying subsectors of the Nigerian economy on Balance of Payments between 1970 and 2016. Conceptual and empirical literature were reviewed and relevant data were extracted from the annual statistical bulletin of the central Bank of Nigeria. Unit root tests were carried out using Augmented Dickey Fuller method which revealed that the variables were integrated at different orders. The autoregressive distributive lag/bound test was used to explore the long run relationship existing among the variables in our model and the result of the bound test showed that the variables in our model are co-integrated thus the study proceeded in evaluating the long run as well as the co-integrating form in the model. It was found that Foreign Direct Investments flows to these subsectors were inversely related to Balance of Payments. The study recommended that government can by the use of moral suasion; appeal to foreign investors to plough back about 70% of their earnings so as to expand their output as such expansion will invariably increase the Gross Domestic Products growth and make our balance of payments favourable; Tax holidays should be granted to investors in Agriculture and Manufacturing and Processing sectors so as to encourage Foreign Direct Investments inflow to these sub-sectors which will no doubt stimulate growth, create more jobs and make more commodities available.

Keywords: Foreign Direct Investment; Balance of Payments; Manufacturing and Processing Sector; Agricultural Sector; Mining and Quarrying Sector.

1.1 Introduction

The Balance of Payments of a country can be conceived as the systematic record of all the economic transactions between the residents of such a country, and the residents of other countries across the world, usually within an accounting period of one year (Abala, 2014). Munteanu and Tudor (2009) posits that Balance of Payments is a statistical statement for a specific period showing the transactions in goods, services and income between an economy and the rest of the world.

Balance of Payments is one of the objectives of macroeconomics which has a significant role to play in the economic development of any nation in the current economic dispensation. Balance of Payments account is subdivided into current account, capital account, and official financing and when added arrives at zero (Kumar, 2007). In this account, the balance may be surplus, deficit and balanced. Surplus is when the debit side is greater than the credit side, the deficit occurred when the debt side is less than the credit side, and balance ensures when both the debit and credit are equal (Kariuki, 2009).

It is generally acclaimed that Foreign Direct Investment play an instrumental role in accelerating the growth of any economy across the world which is proven by the positive indicators of key macro economic variables of which balance of payments is inclusive (Abala, 2014). It is well known that one of the critical economic problems confronting developing countries is the shortage of adequate national savings to meet the financial requirements of positive investment opportunities, thus, these developing countries are usually in constant need of foreign capital inflows which comes in forms of both direct and indirect investments (Munteanu & Tudor, 2009).

Foreign Direct Investment is seen as one of the most important sources of accumulating and building up physical capital which in turn culminates into the creation of employment opportunities, the development of productive capabilities, as well as enhancing the skills of local labour and management capacity through the transfer of technology, and the integration of a country with the rest of the world (Osaro, 2013). Foreign Direct Investment, therefore, is a potential weapon for developing the Nigerian economy which can play an instrumental role in helping to achieve the various macroeconomic objectives of Nigeria, including our much emphasized poverty reduction goal(s). consequently, within the Nigerian economy, Foreign Direct Investment can stand as a significant instrument for building the physical investible capital, create employment opportunities for citizens, develop the productive capacity of the nation enhance the skills and competence of local labour through the transfer of technology and managerial know-how as well as helping to integrate our domestic economy into the large constituted global economy (Kumar, 2007).

Nigeria Balance of Payments in recent times has been deficit unlike the early post-independent

periods when the structure of Nigerian economy was predominantly agrarian and its share to the gross domestic product was relatively high, in other words, about 60% of GDP was from agriculture, while other sectors accounted for the remaining 40% (Ghosh & Ramakrishnan, 2006). Ekpo (1997) posited that Nigerian economy started capsizing in the early 1970's immediately after the oil glut, the oil sector that could hardly contribute 0.6% to the Nigerian gross domestic product suddenly had about 60% accounted for in GDP. Since these periods, the Nigerian Balance of Payments had witnessed deficits (Ekpo, 1997).

1.2 Statement of the Problem

In Nigeria, Balance of Payments problem has been a matter of concern to virtually every citizen of the country for some decades now. Different households in Nigeria are confronted by various economic problems brought about by the Balance of Payments disequilibrium. Our industrialization and technological advancement have remained very low. There has not been any substantial economic growth in the nation despite the fact that a sizeable percent of the country's populations are engaged in Agriculture, the country still import food items to supplement those one produced in the economy.

Unemployment rate in Nigeria economy has become the basic problem in the Balance of Payments disequilibrium. Low rate of employment leads to low level of output and hence high cost of living. It is in view of the above challenges that the researchers carried out this study to examine the effect of Foreign Direct Investment in some major production sectors on Balance of Payments in Nigeria.

2.0 Review of Related Literature
2.1 Conceptual Framework
2.1.1 Foreign Direct Investment

Foreign direct investment (FDI) is defined as investment in foreign assets, such as foreign currency, benefits or property, credits, rights, undertaken by a foreign national for the purposes of production of goods and services which are to be sold either domestically or exported overseas (Abala, 2014). Foreign Direct Investment, according to Kidwell et al, (2008), can also be defined as an investment in a business by an investor from another country for which the foreign investor has control over the company purchased. For balance of payments purposes, Foreign Direct Investment (FDI) is defined as the holding of 10 per cent or more of the voting stock of a foreign enterprise (IMF, 1993). It takes the form of equity capital retained earnings and loans from a parent company.

According to Meyer (2003), Foreign Direct Investment comes with several advantages to developing countries. Foreign Direct Investment is considered a large and growing source of finance that may help developing countries close the technology gap with high income countries, upgrade managerial skills, and develop their export markets and this could leads towards a spillover effect in form of improving productive efficiency in the economy. The earnings from Foreign Direct Investment are, of course, directly related to the activities of transnational companies (TNCs). More than any other component of international transactions, they represent a strong inter-temporal as well as international dimension of those activities. The current values of investment income credits from FDI are related to the overall stock of capital invested abroad in previous years. Thus the history of foreign involvement by a particular country plays a crucial role in its current flow of earnings and, through them, in the structure of its balance of payments.

The volume and the value of FDI flows increased significantly under the impact of globalization and intensification of the existing connections between different financial markets, among developed economies and the developing ones. The recent evolutions of global economy have strongly affected the dynamic of FDI and also the impact that foreign capital flows exert on economic development. The current economic crisis highlighted the fundamental role foreign flows play in the reintegration process of transition and developing economies in the structure of the global market, as FDI are appreciated to be "the definite element of the economic growth, of promoting intensive, qualitative and efficient factors (Munteanu & Tudor, 2009).

2.1.2 Balance of Payments

The Current Account Balance (CAB) is a key component of the Balance of Payment (BOP) and of vital importance in macroeconomic analysis of an open economy. Current account balance measures current payments (cash outflows) and current receipts (cash inflows) between residents of a country and the rest of the world. Kariuki, (2009) explains that current account balance comprises of factor income, balance of transactions of goods and services and current transfers. Current account balance is an important economic measure of how well an economy fairs in international economic transaction and a key indicator of the level of national savings, spending behavior and investment (Wanjau, 2014).

Current account covers all transactions that involve real sources (goods, services, income) and current transfers. The Current Account records exports and imports of goods and services, income receivable and payable abroad as well as current transfers. Current Account transactions are recorded on a

International Journal of Research

Available at https://pen2print.org/index.php/ijr/

e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 05 Issue 22
November 2018

transactions gross basis. All credit transactions (i.e. receipts from abroad) and debit transactions (i.e. payments to abroad) are recorded. According to Todaro and Smith, (2003), current account balance is the difference between a country's total exports and imports of goods and services, plus net investment income, debt service payments, remittances and transfers.

Current account balance is said to be in deficit when there is negative balance and surplus when the balance is positive. The balance of payment identity states that the net balance on the current account should exactly reflect the net balance on the capital and financial account (International Monetary Fund, 2009).

Kandil (2008) observed that the accounting relationship in the balance of payments indicates that a deficit in the current account may be associated with an increase in either the financial balance or a reduction in foreign reserves.

2.1.3 Relationship between Foreign Direct Investment and Balance of Payment

Foreign Direct Investment is a large and growing source of finance that may help developing countries close the technology gap with high income countries, upgrade managerial skills, and develop their export markets and this could lead towards a spillover effect in form of improving productive efficiency in the economy. This is probably the reason why Foreign Direct Investment over the last decade has grown at least twice as rapidly as trade (Meyer, 2003). However at the same time, it is also noticed that widening current account deficits is one of the less desirable macroeconomic effects of large capital inflows like FDI. Developing countries normally ran current account deficit problems and the surge in international capital flows to developing countries have coincided with widening current account deficits in many of these countries (Calvo, Leiderman & Reinhart, 1996).

As a result of the oil prices shocks in 1970s, there have been large swings in current account balances of most countries. These imbalances are caused by mismatch between saving and investment. If international capital inflows are used to increase investment, but savings remains stable; this implies an increase in current account deficit. Hence investment and saving and ultimately current account balance may depend on capital flows. And Foreign Direct Investment is considered to be a critical component of capital flow. And indeed empirical evidence (Ogwuru, 2008; Kariuki, 2009; Ozturk & Acaravci, 2011) suggests that Foreign Direct Investment flows are significantly correlated with the current account financing requirement.

2.2 Theoretical Framework

This study was anchored on the neoclassical theory of investment, and the Balance of Payments constraint model of Balance of payment.

(i) Neoclassical Theory

Early neoclassical theories explain international capital flows with differentiated rates of return across countries that lead to capital arbitrage, with capital seeking the highest return. Cockcroft and Riddell (1991) argue that the future investment flows are directly related to the package of incentives, which influence the expected rate of return; the security of the investment; the scope and speed with which companies are able to disinvest. The tax regime; investment code or guidelines; and overall macroeconomic policies are all elements affecting FDI.

Cockcroft and Riddell (1991) suggest that addressing these problems would certainly help improve the foreign investment climate. According to Meier (1994), the major supply-side determinant of FDI in developing countries is the expectation of higher returns or higher profits by firms.

(ii) Balance of Payment Constraint Model

The Balance of payment constrained model, otherwise known as Thirlwall Law' has gained a lot of popularity. Formulated in 1979 by Thirlwall adopted a Keynesian view of aggregate demand and output but fundamentally incorporates the neoclassical elasticity approach in its formulation. According to this theory, export is the only component of national output that provides foreign reserves which consequently allows the growth of other demand components in an open economy (Bahmani, Oskooee & Ratha, 2004).

BOP constraint model explains that if an economy's rate of import exceeds the rate of exports then balance of payments deteriorates which in turn impedes economic growth. Balance of payment constraints model holds that faster income relative to export growth may only cause balance of payment disequilibrium because it increases demand for imports relative to export thus worsening the Balance of Payment (BOP) position. BOP constraint model conjectures that BOP equilibrium can only be maintained by export led growth. According to the theory, the relationship between export and growth is circular and cumulative to the extent that export led growth increases productivity which further increases competitiveness and revenue growth from exports (Bahmani, Oskooee & Ratha, 2008).

2.3 Empirical Review

This section reviews empirical research relevant to the area of interest to this study. Given the influence of Foreign Direct Investments on the balance of payment position in developed and developing countries, this study focused on literature from different countries within and

outside Africa in an attempt to review literature that was relevant to this study.

Onafowara (2003) investigated the effect of real exchange rate changes on trade balance in three Asian countries namely Malaysia, Indonesia and Thailand. The study used quarterly data from 1980 to 2001. Using Vector error correction model and impulse response method, the results indicated a positive long run relationship between exchange rate and trade balance in all countries under consideration. Comparatively, the results showed that real exchange rate shocks worsened Thailand and Indonesia's balance of trade with respect to major economies such as Japan and the U.S. In all cases, Co-integration analysis shows that there exists a stable long run relationship among current account balance, real income, real exchange rate, and real foreign direct investment and income.

Ogwuru (2008) used time series data from 1970 to 2005 to evaluate the impact of current account balance on the domestic interest rate, exchange rate, money supply and foreign capital flows in Nigeria. Using an error correction model, it was established that depreciation of Naira (Nigerian currency) which allegedly reduces in import demand and increase of Nigeria's export, does not act to improve the Nigeria's current account balance.

Kariuki (2009) used inter-temporal approach to investigate determinants of current account balance in Kenya. Using Annual time series data from 1970 to 2006, the study applied error correction model and Engle-Granger co-integration in an attempt to investigate the short run and long run relationships. It was established that there existed one co-integrating relationship between real exchange rate and economic growth rate, relative prices, degree of openness and level of money supply. The study also found out that current account balance was positively influenced by favorable terms of trade, depreciation in real exchange rate, economic growth and fiscal balance. Shocks such as oil crisis, coffee boom were found to have a significant negative impact on current account balance. This study shows that degree of openness has an important implication on current account balance in the economy.

Britto and McCombie, (2009) examined whether Thirlwall law applies in Brazil but factored in capital inflow into the equation. The study used Autoregressive distributed lag model to estimate import demand function. The study estimated the import demand function and compared the estimated income elasticity from import demand function to the hypothetical income elasticity calculated by dividing average exports over average income as given in Thirlwall's law. The results showed in the short run, Thirlwall law did not apply in Brazil meaning that balance of payment constraint is one of the real inhibitors of short run economic growth in the country. However, the long run model showed that there is a stable relationship between relative prices and current account movement. This means that Thirlwall law holds in the long run. The paper also showed that including capital inflow explains the model balance of payment dynamics further thus recommending that Thirlwall hypothesis should be extended to accommodate capital inflow. The study also observed that if there is a significant co-integrating vector between series of actual growth rates calculated using estimated income elasticity from imports can be interpreted economically as the existence of an equilibrium growth rate around which two series fluctuates.

Ozturk and Acaravci, (2010) utilized an Autoregressive Distribution lag model to investigate the Thirlwall law which states that balance of payment position constrained economic growth in South Africa. Using monthly time series data from 1984 to January 2006, the study found out that Thirlwall hypothesis was supported in South Africa meaning that equilibrium income was equal to the actual income growth in South Africa. The study also established that imports were co-integrated with relative prices and equilibrium growth rate.

Mudida et al. (2012) examined whether Marshal-Lerner condition was applicable in Kenya. Using fractional integration and co-integration methods, the study utilized quarterly data from 1996 to 2011. It was established that there exists a co-integrating relationship between balance of payment and real exchange rate and real income. The study also proved that although the convergence process or J-curve effect was slow, the Marshal-Lerner condition was satisfied in the long run.

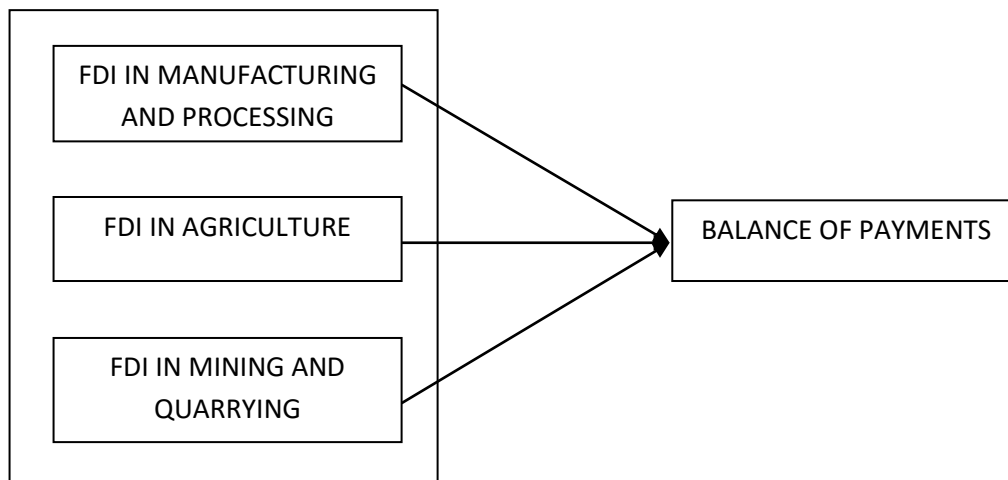**2.4 Conceptual/Operational Framework of the Study Variables**

Figure 2.1: Conceptual/Operational Framework on FDI in Manufacturing and Processing, Agriculture, Mining and Quarrying and Balance of Payments in Nigeria.
Source: Researcher Concept, 2017

3.0 Methodology
This was centred on the method that was adopted by the researchers in achieving the stated objectives of the study. It covered the research design, data source, model specification, justification of variables used and method of data analysis.

3.1 Research Design
The research design adopted for the study is based on quasi-experimental research design. This design was informed based on the nature of data involved, which is a time series data. The researcher used the quasi-experimental design method in the cause of this study.

3.2 Data Source
The data used for this study were obtained from the CBN Statistical Bulletin and Various Issues (1970 – 2016).

3.3 Model Specification
3.3.1 Balance of Payments Model
BOP =f (FDIAF, FDIMP, FDIMQ)   (1)
Stating the exact or mathematical form of (10) above we have:
$BOP = \pi_0 + \pi_1(FDIAF)_t + \pi_2(FDIMP)_t + \pi_3(FDIMQ)_t$ (2)
Economic relationships are inexact therefore stating (11) above in econometric form we have:
$BOP = \pi_0 + \pi_1(FDIAF)_t + \pi_2(FDIMP)_t + \pi_3(FDIMQ)_t + U$ (3)

Apriori Expectation
Foreign Direct Investments (FDI) on the development of Nigerian economy. Foreign Direct Investments is assumed to benefit a developing country like Nigeria, not only by supplementing domestic investment, but also in terms of employment creation, transfer of technology, increased domestic competition, increased export base and other positive externalities. Therefore we expect a positive relationship between FDI and Balance of Payments (BOP).
Where:
FDIAF   =   Foreign Direct Investments in Agriculture
FDIMP =   Foreign Direct Investments in Manufacturing and Processing
FDIMQ =   Foreign Direct Investments in Mining and Quarrying
BOP   =   Balance of Payments

3.4 Data Analysis and Estimation Technique
This study adopted econometric technique. According to Theil (1971) cited in Gujarati and Sangeetha (2007), econometrics is concerned with the empirical determination of economic laws. It is a combination of economic theory, mathematical economics and statistics but it is completely distinct from each of these three branches of science (Koutsoyianis, 1977).
In line with the above, an Autoregressive Distributed Lag (ARDL)/bound testing approach developed by Pesaran, Shin and Smith (2001) was adopted to establish a long run relationship between the variables in each model. This approach

International Journal of Research
Available at https://pen2print.org/index.php/ijr/

e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 05 Issue 22
November 2018

was adopted because it can be used without considering the order of integration of variables, i.e. it can be used with a mixture of variables integrated at levels 1(0), variables integrated at first difference 1(1) or variables that are fractionally integrated (see Persaran et al, 2001). But for the avoidance of having any variable integrated at order 2, we used the Augmented Dickey Fuller (ADF) test to formally explore the stochastic properties of each individual series. Another reason why this approach was adopted is because it involves a single equation setup, making it simple to implement and interpret. Also, different variables can be assigned different lag lengths as they enter the model. And finally because of its extra robustness and better performance for small sample size such as this study period (see Pesaran & Shin, 1997). The bound test is based on the F-test which has a non-standard distribution and with two sets of critical bounds provided by Pesaran, Shin and Smith (2001). The lower critical bound assumes that all the variables are integrated at levels 1(0), while the upper bound assumes all the variables to be integrated at first difference 1(1).

The generic form of the autoregressive distributed lag, unrestricted Error Correction Model is given as:

$$\Delta Y_t = \alpha_0 + \sum_{t=1}^{K1} \alpha_1 i\Delta Y_{1t-i} + \sum_{t=0}^{K2} \alpha_2 i\Delta X_{1t-i} + \sum_{t=0}^{K3} \alpha_3 i\Delta X_{2t-i} + \cdots + \sum_{t=0}^{K4} \alpha_n i\Delta X_{nt-i} + \theta_0 Y_{t-1} + \theta_1 X_{1t-1}$$
$$+ \theta_2 X_{2t-1} + \theta_n X_{nt-1} + \varepsilon_t \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (4)$$

The test for the Null hypothesis of no co-integration against the alternative of the existence of a long run relationship is given as:

H_0: $\theta_{0=} \theta_{1=} \theta_{2=} \theta_n = 0$

H_1: $\theta_{0=} \theta_{1=} \theta_2 = \theta_n \neq 0$

If the computed F-statistic exceeds the upper bound critical values for the asymptotic distribution of the F-statistic provided by Pesaran, Shin and Smith (2001), we conclude that there is co-integration i.e., the null is rejected. On the other hand, if the computed F-statistic falls below the lower bound critical value, we conclude that the variables are 1(0) and the null of no co-integration cannot be rejected. If the F-statistic falls between the bounds, the test is inconclusive.

Recasting (3) in consonance with equation (4) we have:

$$(BOP)_t = \alpha_0 + \sum_{t=1}^{K1} \alpha_1 i\Delta(BOP)_{t-i} + \sum_{t=0}^{K2} \alpha_2 i\Delta(FDIAF)_{t-i}$$
$$+ \sum_{t=0}^{K3} \alpha_3 i\Delta(FDIMP)_{t-i} + \cdots + \sum_{t=0}^{K4} \alpha_4 i\Delta(FDIMQ)_{t-i} + \theta_0(BOP)_{t-1} + \theta_1(FDIAF)_{t-1}$$
$$+ \theta_2(FDIMP)_{t-1} + \theta_3(FDIMQ)_{t-1} + \varepsilon_t \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (5)$$

4.0 Results and Discussions
Table 4.1: Data on the rates of Balance of Payments, and Foreign Direct Investment in Agriculture, Mining & Quarry, Manufacturing & Processing, expressed in Billions

Year	FDIMP (%)	FDIAF (%)	FDIMQ (%)	BOP (%)
1970	22.4	1	51.4	4.534863
1971	28.6	1.2	52.5	5.458752
1972	22.7	0.6	54.7	4.739777
1973	23.2	0.4	52.5	5.978892
1974	20.7	1	54.1	8.733014
1975	22.2	0.8	41.1	5.752583
1976	23.5	0.9	39.3	-6.51026
1977	27.8	3	43.1	-6.11898
1978	44.1	4.3	14.7	7.858332
1979	44.5	3.8	7.32	8.226253
1980	41.5	3.3	18.7	8.477287
1981	45.4	3.2	14	8.706424
1982	37.7	2.2	18.1	7.93616
1983	35.8	2.1	8.6	-6.40126
1984	32.9	2	10.9	6.564985
1985	33.7	1.9	10.9	6.548508
1986	30	1.4	27	-7.35794
1987	31.2	1.2	22.6	5.763318

1988	32.2	1.1	30	-8.43124
1989	49.6	1.2	5.8	9.767416
1990	60.7	3.2	10.5	10.51858
1991	71	3.1	-6.6	9.385906
1992	47.5	1.9	31.3	-11.7795
1993	19.3	1.8	41.5	10.21214
1994	19.9	1.7	37.7	-11.3533
1995	23.2	1	47.5	-12.8755
1996	24.3	1	46.3	-11.5741
1997	24.4	0.9	46.2	7.674432
1998	22.6	0.8	39.3	-12.9976
1999	23.5	0.8	38.2	-13.3898
2000	23.7	0.8	38.5	13.35074
2001	23.5	0.8	38	10.80927
2002	24	0.7	37	-13.9351
2003	25.6	0.7	34.6	-12.6903
2004	26.5	0.7	38	14.62569
2005	0.01	4.6	4.05	14.89632
2006	34.5	0.2	0.21	15.38676
2007	30.4	0.18	0.13	15.37537
2008	15.9	0.2	0.09	15.75634
2009	13.5	0.98	0.07	15.23373
2010	19.9	1.61	0.1	15.28116
2011	13.6	1.13	0.1	15.1669
2012	16.8	1.41	0.83	15.66916
2013	22.8	1.8	0.11	13.4816
2014	17.32	1.38	0.24	15.20729
2015	18.08	1.46	0.27	15.48461
2016	17.72	1.43	0.31	13.45655

Source: CBN Statistical Bulletin (2016)

4.1 Pre-Estimation Test

The data were pre-subjected to descriptive statistics and the result is presented on table 4.2 below.

Table 4.2: Descriptive Statistics

	BOP	FDIAF	FDIMP	FDIMQ
Mean	4.821369	1.550638	28.29638	23.44319
Median	7.936160	1.200000	24.00000	22.60000
Maximum	15.75634	4.600000	71.00000	54.70000
Minimum	-13.93506	0.180000	0.010000	-6.600000
Std. Dev.	10.20035	1.065367	12.72252	19.63315
Skewness	-0.727324	1.212099	1.128214	0.064673
Kurtosis	2.045390	3.806263	4.980580	1.491270
Jarque-Bera	5.928421	12.78165	17.65274	4.490450
Probability	0.051601	0.001677	0.000147	0.105904
Sum	226.6043	72.88000	1329.930	1101.830
Sum Sq. Dev.	4786.172	52.21028	7445.679	17731.19
Observations	47	47	47	47

Source: Eview Data Output, 2018

From the above table, the mean values are 1.55, 28.29, 23.44 and 4.82 for foreign direct investment inflows for agriculture, manufacturing and processing, mining and quarrying and BOP respectively. From these, the data suggests that FDI to the agricultural sector is the least relative to FDI

to manufacturing and processing and mining and quarrying,

The standard deviation showed that foreign direct investment in the agricultural sector (FDIAF) has a smaller spread relative to foreign direct investment to manufacturing and processing and mining and quarrying used in this study. The standard deviation for balance of payments was 10.20.

The table also shows that FDI to manufacturing and processing had the highest inflow in relation to agriculture and mining and quarrying. The agricultural sector had its highest/maximum as 4.6% which is far below mining and quarrying that recorded 54.70% and 71% for manufacturing and processing. This suggests that the agricultural sector receive very little attention from foreign

investors. Furthermore, the minimum for agricultural FDI stood at 0.18% which was greater than both that for manufacturing and processing and mining and quarrying. This implies that FDI to agriculture is much more stable than FDI to the other subsectors.

Table 4.2 further reveal that all the data for the respective variables have a positive tail. This is evidenced by their skewness coefficients.

The Jarque-Bera test statistics which compares the difference between the skewness and kurtosis calculated with that of normal distribution shows that all variables except foreign direct investment in mining and quarrying are not normally distributed given their respective probability values.

4.1.2 Plots for the Series
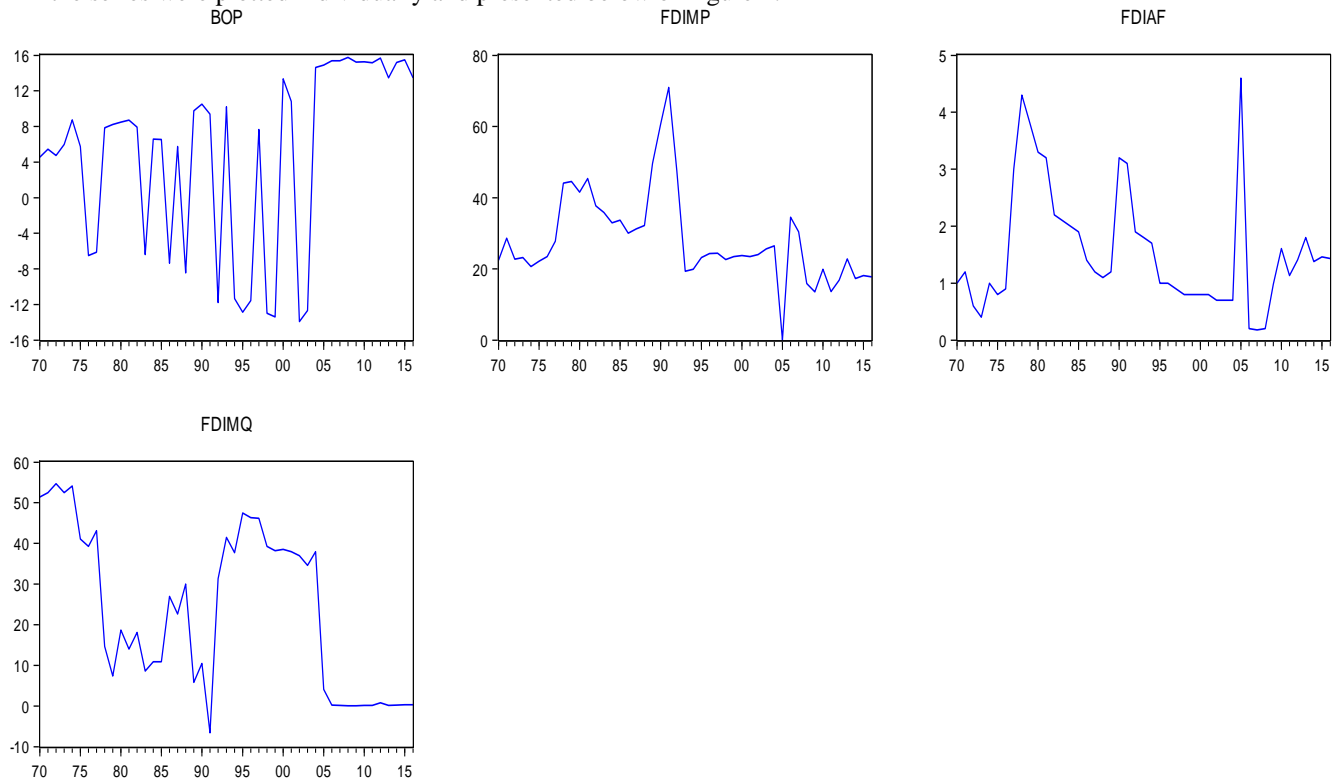All the series were plotted individually and presented below on figure 4.1

Figure 4.1: Line graph for BOP and FDI to various subsectors
Source: Eview Data Output, 2018

The diagram above suggests that all our series are non-stationary. Technically, the diagrams show that all the series are not mean- reversing and they don't have a constant variance given the wide fluctuation as suggested above. Thus, a more formal test for non stationarity or the presence of unit root is required.

4.1.3 Unit Root Test
The series were subjected to the Augmented Dickey-Fuller (ADF) test to explore their stochastic properties. The result of the ADF test is presented below on table 4.3.

Table 4.3: Unit Root Result

VARIABLE	LEVEL		1ST DIFFERENCE		REMARK
	C	C&T	C	C&T	
FDIAF	-3.80*	-3.96**	-8.70	-8.60	I(0)
FDIMP	-2.82	-3.28	-7.08*	-7.00*	I(1)
FDIMQ	-2.03	-2.32	-7.90*	-7.81*	I(1)
BOP	-4.41*	-4.73*	-7.53	-7.54	I(0)

C is Intercept; C&T is Intercept and Trend. * indicate significance at 1% and ** indicate significance at 5%.
Source: E-view Data Output, 2018

The formal unit root result presented on table 4.3 above shows that some of the variables (series) had the presence of unit root while some had no unit root. In other words, some of the series were stationary at level while some were stationary at first difference. For instance, Foreign Direct Investment in Agriculture (FDIAF) and Balance of Payments (BOP) were stationary at level or integrated at order zero I(0) while foreign direct investment to manufacturing and processing (FDIMP) and foreign direct investment to mining and quarrying (FDIMQ) were stationary at first difference or integrated at order one I(1). This result suggest that we may likely estimate a spurious relationship using the data without differencing therefore we explore the long run relationship existing (if any) among our variables in various models. To this end, we adopt the Autoregressive Distributive Lag/Bound testing procedure put forward by Pesaran *et al* (2001) as it allows for the combination of variables integrated at order 1 and order 0.

4.2 Autoregressive Distributive Lag/Bound Test

4.2.1 Balance of Payment Model

About five hundred models were estimated from which the most preferred model was chosen using the Akaike model selection criterion (AIC). Figure 4.2 below is a chart of the top twenty models.
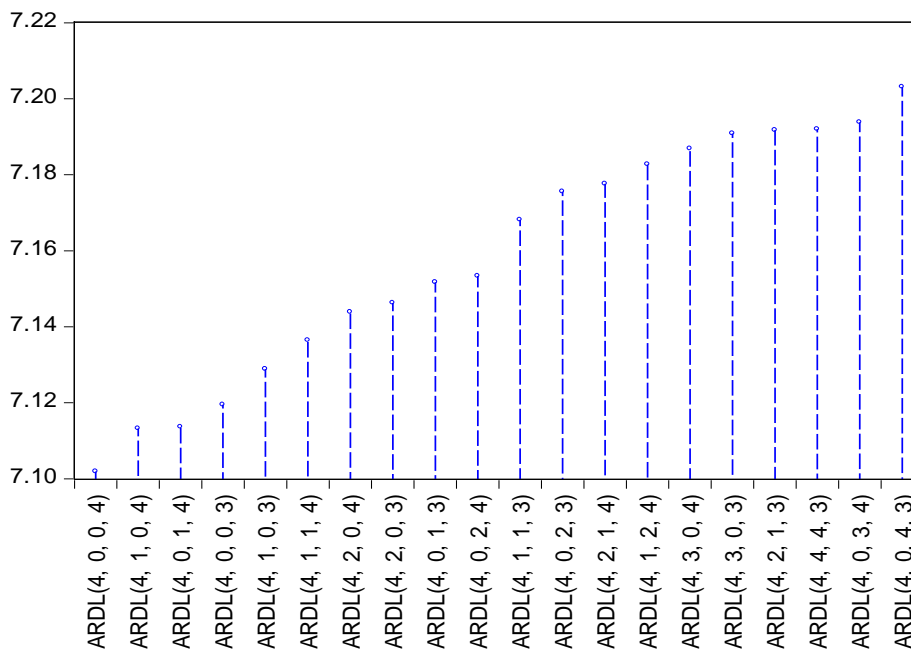

Figure 4.2: Top twenty models preferred by AIC
Source: E-view Data Output, 2018

From the diagram, the most preferred model among the top twenty models is (ARDL 4, 0, 0, 4). Extract of this preferred model is presented below on table 4.4.

Table 4.4: ARDL Model (4, 0, 0, 4)

Variable	Coefficient	t-Statistic	Prob.*

BOP(-1)	-0.069193	-0.426115	0.6730
BOP(-2)	-0.281501	-1.843608	0.0748
BOP(-3)	0.079584	0.533997	0.5972
BOP(-4)	0.432574	2.751473	0.0098
FDIAF	-1.883271	-1.364426	0.1823
FDIMP	-0.078376	-0.673835	0.5054
FDIMQ	-0.389070	-3.044130	0.0047
FDIMQ(-1)	-0.071527	-0.445625	0.6590
FDIMQ(-2)	-0.265484	-1.779259	0.0850
FDIMQ(-3)	0.246243	1.594654	0.1209
FDIMQ(-4)	0.174000	1.432132	0.1621
C	14.92624	2.509593	0.0175

R-Square = 0.63, Adjusted R-Square= 0.50, F-Stats = 4.88, Prob. 0.00

Source: E-view Data Output, 2018

From table 4.4 above, the coefficient of Foreign Direct Investments to Agriculture (FDIAF) shows that FDIAF is inversely related to balances in the country's payments and receipts but on statistical ground, the coefficient is not significant given its reported probability value of 0.18 which is greater than 0.05 (5%) significance level. The coefficient of Foreign Direct Investments in Manufacturing and Processing (FDIMP) shows that it is inversely related to Balance of Payments (BOP) but not significant given its reported probability value of 0.50 which is greater than 0.05 (5%) significance level. The coefficient of Foreign Direct Investments to Mining and Quarrying (FDIMQ) and its first and second lag coefficient are inversely related to BOP but the third and fourth lag coefficients suggest otherwise.

The R-Square value of 0.63 suggest that the model has an explanatory power of 63% and the F-Statistic of 4.88 and its associated probability value of 0.00 shows the overall significance of the model given that it is less than 0.05 (5%) significance level.

The ARDL model (4, 0, 0, 4) was subjected to bound test to explore the long run relationship among the variables and the result is presented below on table 4.5. From the result, the null hypothesis of no long run relationship existing among the variables was rejected as the calculated F-Statistic of 4.66 is greater than the upper critical bound of 4.35 at 5%. Thus, the variables in the balance of payments model are co-integrated. Put differently, the variables have long run relationship among them.

Table 4.5: Extract of Bound Test

ARDL Bounds Test

Date: 04/06/18   Time: 10:31

Sample: 1974 2016

Included observations: 43

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	4.666414	3

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.72	3.77
5%	3.23	4.35

International Journal of Research

Available at https://pen2print.org/index.php/ijr/

e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 05 Issue 22
November 2018

2.5%	3.69	4.89
1%	4.29	5.61

Source: E-view Data Output, 2018

It is required that the error term from the ARDL model should be serially independent otherwise the parameter estimates will not be consistent due to the lagged values of the independent variables that appear as regressors in the model. To this end, we look out for the serial independence of the error term using correlogram presented in the appendix. It is evidenced that there is no autocorrelation in the residuals of the model. Thus, there is serial independence of the residuals in the model. The autocorrelation and partial correlation suggest the absence of serial dependence of the error term given that all probability values are greater than 0.05 (5%) significance level.

ARDL Co-integrating Form and Long Run Form

The long run and co-integrating form are presented below on table 4.6. The long run coefficient of FDIAF indicates that in the long run FDIAF flow is inversely related to balances of Nigeria's payments and receipts. Similarly, the coefficient of FDIMP is inversely related to balances of Nigeria's payments and receipts. Going further, the coefficient of FDIMQ appeared with a negative sign suggesting that FDI flows to Mining and Quarrying is inversely related to payments and receipts balances.

On statistical ground, the coefficients FDIAF and FDIMP are not significant but FDIMQ is significant. This implies that increased flows of FDIAF, FDIMP and FDIMQ have the tendency to reduce payments and receipts balances.

The co-integrating form which is the equivalent to the famous error correction mechanism shows that in the short-run, the coefficients of Foreign Direct Investments in Agriculture (FDIAF) and Foreign Direct Investments in Manufacturing and Processing (FDIMP) are inversely related to BOP suggesting that an increase in FDIAF and FDIMP reduce payment and receipt balances in Nigeria. These coefficients are not significant given their probability values which are greater that 0.05 (5%) significance level. The contemporaneous coefficient of Foreign Direct Investments in Mining and Quarrying (FDIMQ) and its second and third lags indicate an inverse relationship between BOP and FDIMQ whereas the first lag suggest otherwise. The contemporaneous coefficient of Foreign Direct Investment in Mining and Quarrying (FDIMQ) is significant given its reported probability value of 0.00 which is less than 0.05 (5%) significance level.

Table 4.6: ARDL Co-integrating and Long Run Form

ARDL Co-integrating And Long Run Form
Dependent Variable: BOP
Selected Model: ARDL(4, 0, 0, 4)
Date: 04/07/18   Time: 14:31
Sample: 1970 2016
Included observations: 43

Co-integrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BOP(-1))	-0.230657	0.245758	-0.938554	0.3552
D(BOP(-2))	-0.512158	0.198583	-2.579059	0.0149
D(BOP(-3))	-0.432574	0.157215	-2.751473	0.0098
D(FDIAF)	-1.883271	1.380267	-1.364426	0.1823
D(FDIMP)	-0.078376	0.116313	-0.673835	0.5054
D(FDIMQ)	-0.389070	0.127810	-3.044130	0.0047
D(FDIMQ(-1))	0.265484	0.149210	1.779259	0.0850
D(FDIMQ(-2))	-0.246243	0.154418	-1.594654	0.1209
D(FDIMQ(-3))	-0.174000	0.121497	-1.432132	0.1621
CointEq(-1)	-0.838536	0.295635	-2.836390	0.0080

Cointeq = BOP - (-2.2459*FDIAF -0.0935*FDIMP -0.3647*FDIMQ + 17.8004)

Long Run Coefficients				

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDIAF	-2.245905	1.822366	-1.232412	0.2271
FDIMP	-0.093468	0.128498	-0.727384	0.4724
FDIMQ	-0.364729	0.089986	-4.053168	0.0003
C	17.800359	4.252820	4.185542	0.0002

Source: E-view Data Output, 2018

5.0 Conclusion and Recommendations
5.1 Conclusion
This study analysed sectoral Foreign Direct Investment inflows and its effect on Balance of Payment in Nigerian over the period 1970 – 2016. Before this, it explored the trends of this flow and the impact of FDI on the Nigerian economy and the Balance of Payment within the years under review. Based on the analysis and the hypotheses tested, the major findings of the study are summarized as follows:

The outcome of our analysis on the balance of payments model reveals that in the short run, Foreign Direct Investments in the agricultural sector is inversely and insignificantly related to balance of payments; Foreign Direct Investments in the manufacturing and processing sector is inversely related to balance of payments and the relationship is not significant; Foreign Direct Investments in mining and quarrying sector is inversely related to balance of payments in the first and second lag, but positively related to balance of payments in the third lag, however, the relationship is not significant; r^2 of 0.63 shows that the model has an explanatory power of 63% and the f-statistics of 4.88 shows the overall significance of the entire model.

In the long run, Foreign Direct Investments in the agricultural sector is inversely and insignificantly related to balance of payment; Foreign Direct Investments in the manufacturing and processing sector is inversely related to balance of payments and the relationship is not significant, Foreign Direct Investments in the mining and quarrying sector is inversely related to balance of payments and the relationship is not significant, Foreign Direct Investments in the mining and quarrying sector is inversely related to balance of payments and the relationship is significant; the error correction term of the model turned up with the appropriate negative sign, it also showed that 84% of disequilibrium in the model is reconciled annually.

5.2 Recommendations
Based on the findings of the study, the following policy recommendations are proposed:
1. The Nigerian Government should build a strong institutional framework, mainly in areas of investor protection and investment facilitation. Investors should be convinced of the efforts being made regarding tackling political, security risks and the environment of uncertainty. With these in place, these sub sectors will attract more FDI and consequently lead to a favourable Balance of Payment, increase in the economic growth and development of the country.
2. Government can by the use of moral suasion; appeal to foreign investors to plough back about 70% of their earnings so as to expand their output as such expansion will invariably increase the Gross Domestic Products growth and make our balance of payments favourable.
3. Policy makers should put all machinery in place to encourage FDI inflow in the Nigerian most active sectors, especially Agric and manufacturing sectors as they have the lowest influence on the Balance of Payments. Government should examine the existing laws, remove bottlenecks and devise ways of increasing foreign investment flow in Agric and manufacturing investments.
4. Tax holidays should be granted to investors in Agriculture and Manufacturing and Processing sectors so as to encourage Foreign Direct Investments inflow to these sub-sectors which will no doubt stimulate growth, create more jobs and make more commodities available.

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