

Foreign Direct Investment and Sustainable Development: the Nigerian Recession in Perspective

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Abstract

This paper employs a two-stage analysis involving robust regression using M-estimation method and discriminant analysis to assess the impact of foreign direct investment (FDI) on recession in Nigeria, based on monthly data for 2015–2017 and a binary variable for economic recession. Results indicate the highly significant negative co-movement between FDI outflows and economic recession could help explain the prolonged nature of the recession witnessed in Nigeria. Results also show there is a statistically significant difference in dependent variable groups (non-recession and economic recession) for all the three variables (FDI inflow, FDI proportion in total investments and FDI outflow) included in the discriminate analysis. The discriminating power is $p < .028$, $p < .019$ and $p < .018$ for FDI inflow, FDI proportion and FDI outflow respectively with FDI outflow and FDI proportion having about the same discriminating power. Furthermore, the model is very good at identifying group₁ (economic recession) both in the original and cross-validated cases which report 83.3% correct classification. The classification matrix for this model reports 77.4% correct classification of original grouped cases. In addition, the accuracy rate for the cross-validated cases –also 77.4%, is the overall model fit. The paper therefore recommends government employ recession-proof policies to facilitating risk amelioration, stabilize the market for long-term capital and to boost sustainable economic development in Nigeria.

Keywords:

Foreign direct investment,
Sustainable development,
Economic recession,
Discriminate analysis.

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Background to the Study

The starting point for Adam Smith's Theory of Development is capital accumulation whose standard indicators now include capital formation, gross fixed capital formation (GFCF) and foreign direct investment (FDI). Hence, in modern-day society, researchers and policy makers often consider foreign direct investment significant for development and even for sustainable development (Kardos 2014). As such, current trends worldwide have shifted focus from mere development to sustainable development as exemplified by the United Nations' World Transformation Agenda 2030 (United Nations 2014, 2015) comprising 17 sustainable development goals (SDGs). This paper is focused on SDG17 of the United Nations' World Transformation Agenda 2030 dealing with strengthening the means of implementation and revitalize the global partnership for sustainable development (see Box1).

BOX1: SDG17 on Partnership for Sustainable Development

SDG17.1 Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection .

SDG17.3 Mobilize additional financial resources for developing countries from multiple sources .

SDG17.4 Assist developing countries in attaining long-term debt sustainability through coordinated policies aimed at fostering debt financing, debt relief and debt restructuring, as appropriate, and address the external debt of highly indebted poor countries to reduce debt distress.

SDG17.5 Adopt and implement investment promotion regimes for least developed countries .

However, for sub-Saharan African countries, the pattern of the FDI that does exist is often skewed towards extractive industries, implying the differential rate of FDI inflow may be due to natural resources, although the size of the local market may also be a consideration (Morriset 2000; 2001). Nigeria's 2016 recession has been deeper and more prolonged than initially envisaged, lasting for almost two years. Although the recession has now been declared over by the National Bureau of Statistics (NBS), sceptics abound (including this author) given the realities on ground. This is the context in which the study is carried out. Due to the complexity of the subject, the research may also offer prospects for further studies.

Statement of the Problem

Nigeria is largely believed to be a high risk market for investment even as investment yields consistently remains high, because of factors such as bad governance, corruption and unsound economic policies. Hence, despite the various economic measures put in place by the Nigerian government, there seems to be insufficient inflow of FDI into the country even without the added scenario of an economic recession. Moreover, the role of FDI in Nigeria remains an empirical issue since the Nigerian economy is yet to demonstrate clearly the dividends of FDI, despite the observable efforts such as the Nigerian Investment Promotion Council (NIPC) and diverse incentives to foster and attract FDI into the country.

Objectives of the Study

The paper therefore aims to examine the impact of FDI on Nigeria's recession and identify lessons for sustainable development.

Following this introduction, Section Two presents some literature review while Section Three presents the methods and materials. Section Four discusses the results and Section Five concludes with some policy recommendations.

Literature Review

Conceptual Framework

In its classic definition, foreign direct investment is defined as a company from one country making a direct physical investment into building a factory in another country. The direct physical investment in buildings, machinery and equipment is in contrast with making a portfolio investment, which is considered an indirect investment. Hence, foreign direct investment may take many forms, such as a direct acquisition of a foreign firm, construction of a facility, or investment in a joint venture or strategic alliance with a local firm with attendant input of technology, licensing of intellectual property etc.

Foreign direct investment, commonly known as FDI, "refers to an investment made to acquire lasting or long-term interest in enterprises operating outside of the economy of the investor." The investment is direct because the investor, which could be a foreign person, company or group of entities, is seeking to control, manage, or have significant influence over the foreign enterprise (IMF1985). FDI is a key element in international economic integration which creates direct, stable and long lasting links between economies to promote transfer of technology and know-how between countries and allow host economies promote their products more widely in international markets (OECD 2013). FDI is defined as cross-border investment by a resident entity in one economy with the objective of obtaining a lasting interest in an enterprise resident in another economy. The lasting interest implies the existence of a long- term relationship between the direct investor and the benefiting enterprise and significant degree of influence by the direct investor on the management of the benefiting enterprise. Ownership of at least 10% of the voting power, representing the influence by the investor, is the basic criterion used (OECD 2013).

Theoretical Review

Fluctuations in investment explain a large portion of cyclical volatility of output and income and in theory, most economists relate high rates of investment to economic growth in the long run. Investment is therefore a central macroeconomic variable and many works have attempted to investigate theoretical and empirical relationships regarding investment with various conclusions (Ayanwale2007, Abdul-Mottaleb2010, Olokoyo 2012, Akinmulegun2012, Alam, & Shah2013).

According to endogenous growth theorists, economic development creates demand for particular types of financial arrangements, and the financial system responds automatically to these demands (Goldsmith 1969, McKinnon 1973, Baxter and Crucini1993). Hence, the financial system of a country mobilizes savings and allows altering its composition in a way that is favorable to capital accumulation and technological innovation.

This view is however contrary to exogenous growth theorists such as Robinson (1952) and Kuznets (1955) who contend that the role of financial development is exaggerated and that financial development follows growth of the real economy. Hence, to the exogenous growth theorists, causality if it exists, runs from growth to financial development.

Empirical Review

Vast studies emphasize the economic effects of FDI inflows to developing countries and have reported determinants of FDI to include trade openness; natural resource dependence, higher budget deficit, and growth rate (Alfaro2006, Olokoyo2012, Chia and Ogbaji 2013, Idoko et al 2015, Abdul Rahim et al 2017). Nevertheless, the importance of political institutions in host countries or the host country's governing institutions have also received attention (i.e. competent regulatory agencies, efficient legislatures, transparent judiciaries and fundamental democratic rights). For instance, a study by Singh (1995) considered not only economic variables but also social and political determinants of FDI namely political risk and business conditions, which turned out to be significant determinants of FDI. Similar empirical studies have however reported contradicting results concerning linkages between democracy and FDI. While some studies report positive linkages between democracy and FDI (Jensen 2003), others report negative relationships (Li and Resnick 2003).

Methodology and Data

Data

Secondary data for 31 months from January 2015 – July 2017 on domestic and foreign portfolio participation in equity trading is obtained from the Nigerian Stock Exchange. The data period ranges from one year (12 months) prior the onset of economic recession and a month after the recession is declared over.

Methodology

The methodology employs a two-stage approach.

Stage1: Robust Regression

Robust Least Squares (RLS) regression modeling using M-estimation method is employed in Stage1 using **computer software**-Views 8 in preference to Ordinary Least Squares (OLS) regression given the nature of the study's dependent variable defined below. The advantage of RLS regression is that this approach is not as vulnerable as OLS to unusual data and the M-estimation method addresses dependent variable outliers where the dependent variable differs noticeably from the regression model norm. Moreover, RLS can also be used to detect influential observations and its standard errors take into account issues of lack of normality, heterogeneity and whether observations may be non-independent.

Specification of RLS Regression Model

The RLS model estimated using M-estimation method is of the following form:

$$GDP = C_1FPP + C_2FPI + C_3FPO + C_4 \dots \dots \dots (1)$$

Where C_i = coefficients estimated
The other variables are as defined in Table 1 below.

Stage2: Discriminate Analysis

Discriminate analysis is employed in Stage 2 using **computer software** IBM SPSS 23 to identify the independent variable (s) that have a strong relationship to group membership in the categories of the dependent variable and to deriving the discriminate function.

Specification of Discriminate Model

Equations 1 above is re-specified as a discriminate function and estimated as follows:

$$Z_{GDP} = \alpha + \omega_1FPP + \omega_2FPI + \omega_3FPO \dots \dots \dots (2)$$

Where:
 Z_i = Discriminant (Predicted) Z score of discriminate function for DV_i ,
 α = Intercept or constant.
 ω_i = Discriminant coefficient or weight for the Independent variables.

Definition of Variables

Foreign portfolio investments (FPI) as captured by the Nigerian Stock Exchange are proxy for foreign direct investment (FDI). The categories of the variables are defined and specified as follows:

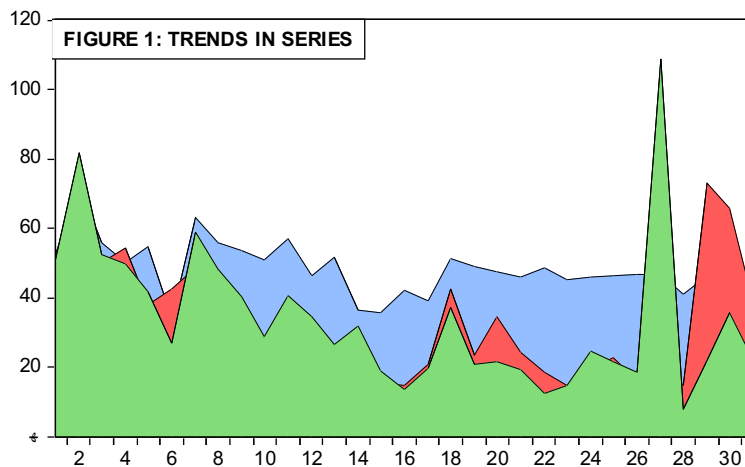
Table 1: Definition of Variables

Variable	Definition
FPI	Foreign Portfolio Inflow which is proxy for FDI inflow
FPO	Foreign Portfolio Outflow which is proxy for FDI outflow
FPP	Foreign Portfolio as percent of Total Investments which is proxy for percent FDI in Total Investments
GDP	This is the Dependent Variable proxy for Recession which has value of 0 if before or after the 2016 recession and 1 otherwise.

Results and Discussions

Trend Analysis

Total foreign transactions decreased by 33.39% from ₦1,538.92 billion recorded at the end of 2014 to ₦1,025.07 billion at the end of 2015 and further by 49.51% from ₦1,025 billion recorded at the end of 2015 to ₦517.55 billion at the end of 2016. At the end of July 2017, at a time the National Bureau of Statistics (NBS) declared Nigeria was out of recession, total foreign transactions further decreased by 59.5% from ₦101.53 billion recorded at the end of June 2017 to ₦60.507 billion. Consequently, domestic investors outperformed foreign investors by a 37.68% margin at the time the NBS declared Nigeria out of recession.



Source: Nigerian Stock Exchange

The area graph of the series presented in Figure 1 indicates FDI outflows overwhelmed FDI inflows for most of the study period. Trends in FDI as percentage of total investments was generally negative during the period of study as also indicated.

Robust Least Squares Analysis

The result of the RLS regression using M-estimation method is presented in Table 2 below and the estimated RLS regression equation is given as:

$$GDP = 0.0212FPP + 0.0025FPI - 0.0323FPO + 0.4802 \dots \dots (3)$$

The results indicate all the signs of the variables are in line with economic expectations. From the results, increases in both the inflow of FDI and the proportion of FDI in total investments positively affect recession but only the effect of proportion of FDI in total investments is significant. As more FDI flows into the recession economy, this is expected to stimulate growth in line with several findings in literature (Kinda 2010, Solomon and Eka 2013).

On the other hand, an increase in outflow of FDI worsens the recession and the effect is highly significant. In the same vein as inflows, as more FDI flows out of the recession economy, this is expected to further put pressure on measures to get out of the recession as growth is further dampened. The highly significant negative co-movement between FDI outflows and economic recession in this study could help explain the prolonged nature of the recession witnessed in Nigeria from the beginning of 2016.

Table 2: Robust Least Squares Regression - Dependent Variable: GDP Method: M-estimation

Variable	Coefficient	Std. Error	z-Statistic	Prob.
FPP	0.021214	0.010827	1.959390	0.0501
FPI	0.002478	0.004961	0.499418	0.6175
FPO	-0.032268	0.004277	-7.544252	0.0000
C	0.480216	0.451372	1.063901	0.2874
Robust Statistics				
R-squared	0.418702	Adjusted R-squared	0.354113	
Rw-squared	0.593953	Adjust Rw-squared	0.593953	
Akaike info criterion	42.12198	Schwarz criterion	48.86726	
Deviance	3.887493	Scale	0.332650	
Rn-squared statistic	64.86014	Prob(Rn-squared stat.)	0.000000	
Non-robust Statistics				
Mean dependent var	0.580645	S.D. dependent var	0.501610	
S.E. of regression	0.677728	Sum squared resid	12.40152	

Multiple Discriminate Analyses

The results of the model estimation using discriminate analysis procedure of the computer software IBM SPSS Statistics 23 is presented below in Tables 3 – 5 and Figures 2 – 3.

Table 3: Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
FPI	.843	5.386	1	29	.028
FPP	.825	6.163	1	29	.019
FPO	.821	6.326	1	29	.018

From Table 3 above, the **results of the discriminate analysis estimation of Model 2** show there is a statistically significant difference in dependent variable groups (non- recession and economic recession) for all the three variables (FDI inflow (FDI), %FDI in total capital market investments (FPP) and FDI outflow) included in the discriminate analysis.

This indicates all the predictors are relevant to discriminating between the groups of months where development rates in the Nigerian economy (GDP) indicate either non- recession or economic recession with outflow of FDI producing highest value F. The discriminating power is $p < .028$, $p < .019$ and $p < .018$ for FDI inflow, FDI proportion and FDI outflow respectively with FDI outflow and FDI proportion having about the same discriminating power.

GDP			Predicted Group Membership		Total
			0	1	
Original	Count	0	9	4	13
		1	3	15	18
	%	0	69.2	30.8	100.0
		1	16.7	83.3	100.0
Cross-validated ^b	Count	0	9	4	13
		1	3	15	18
	%	0	69.2	30.8	100.0
		1	16.7	83.3	100.0

a. 77.4% of original grouped cases correctly classified.

b. Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.

c. 77.4% of cross-validated grouped cases correctly classified.

Figure 2: Discriminant Function for Non-recession

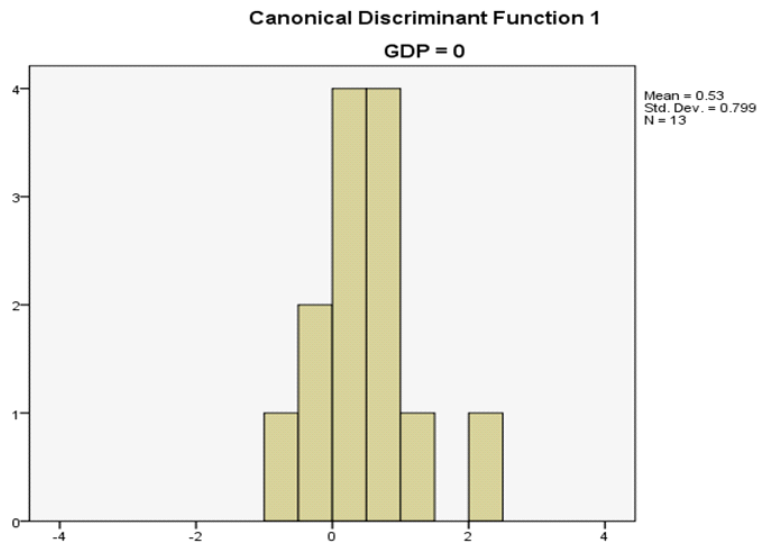
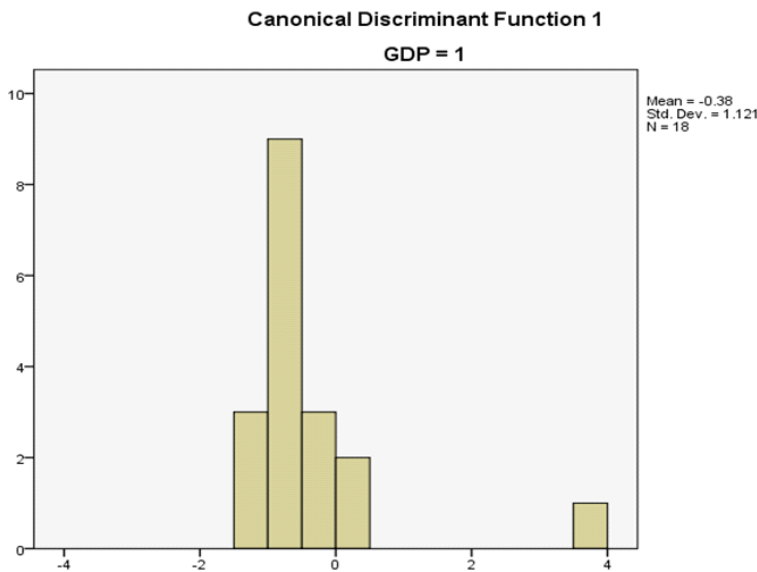


Figure 3: Discriminant Function for Recession



From Table 4 and Figures 2 – 3 above, the model is very good at identifying group₁ (economic recession) both in the original and cross-validated cases which report 83.3% correct classification. The classification matrix for this model reports 77.4% correct classification of original grouped cases. In addition, the accuracy rate for the cross-validated cases –also 77.4%, is the overall model fit.

From Table 5 below, the discriminate function as a whole (Function₁) has significant discriminating power of $p < .018$ (the same as FDI outflow) but does not explain 82.1% of the variation in the grouping variables i.e. it explains only 18.9% of the variation in the grouping variables.

Table 5: Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	.821	5.623	1	.018

Conclusions

This paper employs a two-stage analysis involving robust regression using M-estimation method and discriminant analysis to assess the impact of foreign direct investment (FDI) on recession in Nigeria, based on monthly data for 2015–2017 and a binary variable for economic recession. Results indicate the highly significant negative co-movement between FDI outflows and economic recession could help explain the prolonged nature of the recession witnessed in Nigeria. Results also show there is a statistically significant difference in dependent variable groups (non- recession and economic recession) for all the three variables (FDI inflow, FDI proportion in total capital market investments and FDI outflow) included in the discriminant analysis. This indicates all the predictors are relevant to discriminating between the groups of months where development rates in the Nigerian economy (GDP) indicate either non- recession or economic recession with outflow of FDI producing highest value F. Furthermore, the model is very good at identifying group₁ (economic recession) both in the original and cross-validated cases which report 83.3% correct classification. The classification matrix for this model reports 77.4% correct classification of original grouped cases. In addition, the accuracy rate for the cross-validated cases –also 77.4%, is the overall model fit.

Policy Recommendations

The paper therefore recommends government employ recession-proof policies to facilitating risk amelioration, stabilize the market for long-term capital and to boost sustainable economic development in Nigeria.

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