A MACRO-ECONOMETRIC ANALYSIS OF TRADE OPENNESS, FOREIGN DIRECT INVESTMENT AND THE PERFORMANCE OF THE NIGERIAN ECONOMY

EMMANUEL TORDUE KPOGHUL[1*], ISA JIBRIN OKPE[2], & GBATSORON ANJANDE[3]

1, 2 & 3 Department of Economics, Benue State University Makurdi, Nigeria.
Email: kpoghultordue@gmail.com Phone No: +2348063595920
Email: ijokpe@yahoo.co.uk Phone No: +2348032939225
Email: ganjande@yahoo.com Phone No: +2348030591764

ABSTRACT

This study investigates the tripartite relationship between trade openness, foreign direct investment and the performance of the Nigerian economy within a framework of macro econometric model. The theoretical underpinning for this study is the factor proportion model of international trade, Flying Geese FDI model and the Keynesian Mundell-Fleming IS-LM framework. The study used secondary data spanning from 1970 to 2018 for within sample forecast and a five-year out-of-sample forecast, spanning from 2019 to 2023 was performed under four policy scenarios in line with the Economic Recovery and Growth Plan (ERGP). The findings reveal that trade openness attracts foreign direct investment and they affect macroeconomic performance in Nigeria through direct and indirect channels. The simulation results established that increase trade openness, FDI, government expenditure and broad money supply would bring about increase in the endogenous variables such as private investment, real consumption, outputs of oil and non-oil, significant increase in non-oil exports, and government revenues among others. The study recommends that in line with ERGP, government should build a globally competitive economy and improves on the business environment; there should be diversification from oil to non-oil and from narrow gauge primary exports to finished products; CBN should ensure macroeconomic stability as a strategy for trade openness and attraction of FDI.

Keywords: Trade Openness, Foreign Direct Investment, Economic Performance and Simulation.

JEL Classification: F4, F41, F47

1. Introduction.

Trade openness is undoubtedly one of the international trade policies adopted by the developing countries in the late 1980s following the World Development Report (1987) which observed that "outward oriented countries performed better than inward oriented countries" even under unfavorable market conditions, as a solution to their economic challenges. It is part of contemporary globalization policies pursued by both developed and developing countries like

Nigeria to promote world economic integration. The Neoclassical and endogenous theoretical submissions underline that the process of trade openness does not only increase trade but also enhance the inflow of Foreign Direct Investment (FDI). Foreign Direct Investment promotes economic growth in a capital scarce economy by increasing volume as well as efficiency of physical investment (Barro & Sala-I-Martin, 1995). On the other hand, FDI provides long-term capital with new technologies, management know-how and marketing capabilities which, in turn, argument economic growth by creating employments, increasing managerial skills, diffusing technologies and fostering innovations (Asiedu, 2006).

Nigeria has benefited immensely from international trade policies and in particular from FDI inflows. According to UNCTAD 2019 World Investment Report, Nigeria is the third host economy for FDI in Africa, behind Egypt and Ethiopia. FDI flows to Nigeria totaled USD 1.9 billion in 2018, and showed a decrease compared to the previous year (USD 305 billion in 2017) under the effects of austerity measures. The total stock of FDI in 2018 represents 25.1 per cent of the country's Gross domestic Product (GDP) and is the least volatile of capital flows, and more importantly, can have direct and indirect effects on macroeconomic performance. However, Nigeria's shares of world trade and foreign direct investment flows have remained unstable and are subject of concern having been regarded as "giant" of Africa. Over the years, the Nigerian government has taken various measures such as the Structural Adjustment Programme (SAP) in 1986 and recently the Economic Recovery and Growth Plan (ERGP) in 2017, necessary to open up other sectors of the economy apart from the oil and gas sector of the economy and also woo foreign investors into Nigeria.

The recent Economic Recovery and Growth Plan (ERGP) launched in 2017 by the Nigerian government, quest to achieve diversification and macroeconomic stability: taking into cognizance the binding regional and multilateral trade obligations. The ERGP as a policy reform is focused on achieving three policy enablers to support initiatives in key sectors of the economy: industrial and trade policy, digital-led strategy for growth, and cross-sector strategies. The overall objective is to promote non-oil export through zero oil plan and use trade policy tools to tackle dumping and balance of payment crisis to raise non-oil exports as a share of total export from 7.5 per cent to 15.0 per cent by 2020 (Ministry of Budget and National Planning, 2017).

In spite of programmes and policies made to open up the economy and stimulate inflow of foreign direct investments and enhance economic performance of Nigeria, the ugly trend persists. Between 2000 and 2014, Nigeria's Gross Domestic Product (GDP) which is one of the indicators of economic performance grew at an average rate of 7.0 per cent per year. Following the oil price collapse (which is the main export commodity) in 2014 up to 2016 combined with negative production shock, the GDP growth rate dropped to 2.7 per cent in 2015. In 2016 during its first recession in 25 years the Nigerian economy contracted by 1.6 per cent. By 2018 economic growth remains muted and averaged 1.9 per cent and remained stable at 2 per cent in the first half of 2019. Domestic demand remains constrained by stagnating private consumption in the context of high inflation averaging 11 per cent in the first half of 2019 (CBN, 2019). This rate of growth is low and insufficient to improve the living standard (as a measure of economic performance) to accepted level coupled with the low savings and investment rate in Nigeria. However, trade openness and foreign direct investment are needed to bridge the gap between

savings and investment and as well resuscitate the dwindling GDP growth rate and other macroeconomic variables in Nigeria.

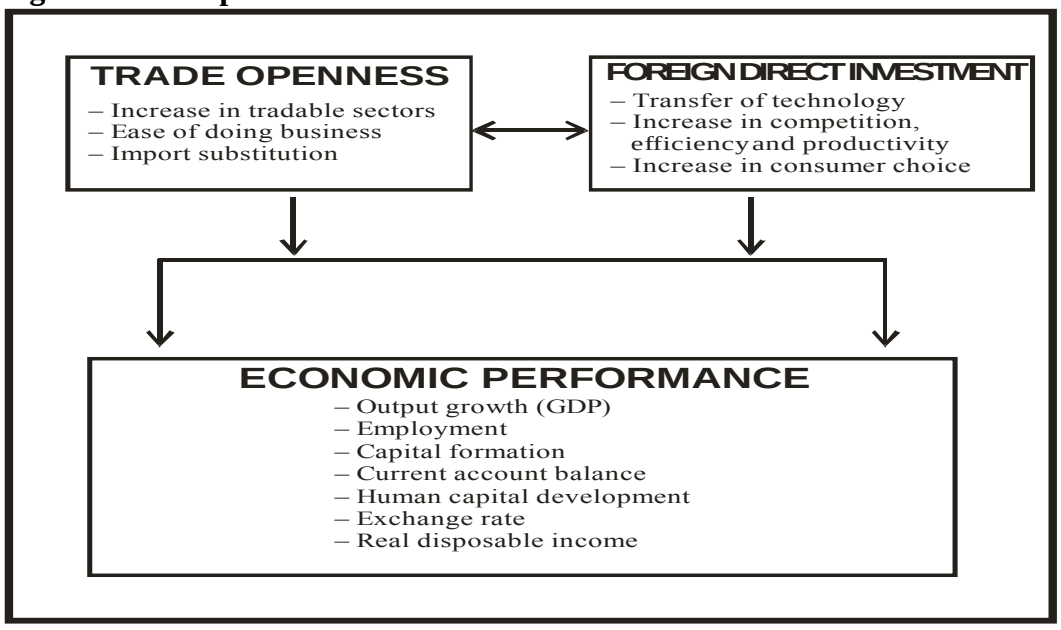
In view of the foregoing, the objective of this study is to examine holistically the sectoral effects of the tripartite relationship between trade openness, FDI and macroeconomic performance in Nigeria within the framework of a macro econometric model. The reminder of the paper is organized as follows: section two presents literature review, while section three provides an exposition of the methodology, section four is results presentation and discussion of findings, and section five concludes the paper with some policy recommendations.

2. Literature Review

2.1 Conceptual Clarifications

The concepts of trade openness, foreign direct investment and economic performance are closely interrelated. This interrelatedness is supported by factor proportion theory of international trade, the Flying Geese FDI model and the Keynesian and Mundell-Fleming IS-LM model. The postulations of these aforementioned supportive theories are presented in the following framework to explain the relationship between trade openness, foreign direct investment and economic performance of the Nigerian economy.

Figure 1: Conceptual Framework



Source: Authors' compilation.

From the symbolic interactions as presented in the conceptual framework, trade openness is concerned with increasing the tradable sectors of the economy in relation to total output, also by collapsing barriers at the national frontier with the aim of ensuring the ease of doing business. This implies diversifying the economy from a mono economy which is likely to affect the behavior of macroeconomic variables such as output growth, total exports; capital inflow and it redirect factor endowments to more productive sectors (Eleanya, 2013). Foreign direct investment here is an inflow of package of foreign physical capital, production techniques and

utilities that tends to impact the domestic enterprises in the host economy both direct and indirectly such as increase in competition, technological diffusion, increase in economic efficiency, increase in consumer choice and employment rate among others (Okonkwo, Egbunike, and Udeh, 2015). For economic performance, when an economy is open like the Nigerian economy, it attracts the inflow of foreign direct investment. This according to Hofmann (2013) is expected to affect economic performance directly and indirectly for example the behaviour of macroeconomic variables such as output growth (GDP), private investment, employment, real consumption, human capital development, current account balance, disposable income and capital formation.

2.2 Theoretical Underpinning

In this section, the theoretical postulations about trade openness, foreign direct investment and macroeconomic performance are explored beginning from the classical to the Keynesians. The factor proportion theory as propounded by Hecksher-Ohlin-Samuelson (H-O-S) in 1933 is able to provide an explanation on how free trade leads countries to specialize in the production and export of goods and services that utilize greater quantities of their relatively abundant factors and import goods and services that are relatively scarce. According to Mundell (1976) neutralizing the assumption of factor mobility, trade between two countries takes place to a level at which factor price tends to equalize in both countries, in absolute as well as in relative terms. However, once capital is allowed to move freely across the countries (i.e., from capital-abundant to capital-scarce country) the difference in factor prices are reduced, while the difference in comparative cost will diminish. Hence trade will decline and will be substituted completely by FDI. International trade leads to a Pareto-efficient equilibrium that yields higher welfare through its effect on the allocation of resources between sectors.

The Flying Geese model introduced in the early 1960s exposed the complementary relationship between FDI and trade. It assumed that Multinational Enterprises (MNEs) relocate their production based on labour cost in order to avert production cost and retain competitiveness. On the basis of host country comparative advantage (abundant factors), the presence of MNEs increase the export supply capacity of the host country and brings in modern technology, physical capital, managerial and organizational skills among others.

On the other hand, the Keynesian and by extension the Mundell-Fleming IS-LM model for aggregate demand describe the behavior of macroeconomic variables (output, consumption, investment activities, fiscal trajectories, exports and imports) within the framework of a small open economy considering monetary dynamics with international financial relations.

2.3 Empirical Review

Various empirical studies on the tripartite relationship between trade openness, foreign direct investment and macroeconomic performance have been undertaking, employing divers estimation procedures and submissions. Wahab (2020) examined the role of trade liberalization policy on the nexus between services sector FDI and economic growth in Nigeria for the period 1981 to 2018. The study employed time series analysis with policy scenarios with and without a structural break to account for shift dummy in the series. The findings reveal the existence of long-run relationship between services FDI and economic growth, though services FDI spurs

growth when policy shift is not included but retards growth when it is included. The short-run estimate under scenario without break showed significant positive relationship with growth but negative and statistically insignificant under scenario with break. The study established that services FDI could only play a significant role in Nigeria's growth given the level of trade liberalization when there is no change in government policy or intervention.

Nketiah *et al* (2020) investigated the relationship among FDI, trade openness and economic growth in Ghana taking the period of post-liberalization covering 1975 to 2017. Using the Ordinary Least Squares (OLS) estimator, the study established that trade openness is the main factor affecting GDP growth (annual %) in Ghana. Also, the study finds that FDI and inflation had negative or positive impact but were not statistically significant on GDP growth (annual %). Hence, the study concludes by recommending robust measures to enhance trade openness in terms of encouraging exports and inflow of FDI through the creation of an enabling and friendly environment to do business for output growth dynamics in Ghana.

In another related study by Su, Nguyen and Christophe (2019) on the role of trade openness and FDI inflow on the growth of economic institutions in the 63 provinces of Vietnamese for the period 2005 to 2015. The study employed the General Method of Moments (GMM) estimator to ascertain the influence of institutional quality on the inward FDI, trade and growth. The findings show that first; the combined effect of inward FDI with trade openness has a substitute effect on the economic growth while they have a positive impact taken separately. Second, economic institutions significantly influence the combined effects of FDI with trade openness in improving economic growth.

Zaman et al (2018) examined the relationship among openness of trade and FDI inflows for India, Iran and Pakistan over the period 1982 to 2012. Fixed effect and pooled OLS techniques were employed to analysis the panel data for measuring individual country effects, group effects and time effects while exploring the relationship among openness of trade and FDI inflows. The findings reveal that higher trade openness has significant positive impact on FDI inflows. Again, the study showed that FDI inflows seem to be affected significantly by conventional determinants like exchange rate, inflation and GDP per capita etc. based on the findings, the study lent support to increase in the level of trade openness as a better option for more and sustained FDI inflows for the long run and improvement in the welfare of the people.

In another study by Cinar and Nulambeh (2018) on the impact of FDI and trade openness on economic growth for 34 Sub-Saharan African (SSA) countries, the study employed augmented endogenous growth model using panel data for the period 2006 to 2015. The findings show that FDI and trade openness positively impact SSA growth with the exception of inflation which shows a negative effect on growth. The study lent support to increase efforts towards the creation of favorable business climate that attract more FDI to SSA and enhance long term economic growth.

Mahmoodi and Mahmoodi (2016) investigate the causality among trade openness, FDI and economic growth for eight European developing countries for the period 1993 to 2013, within the framework of Panel-VECM causality. The results of causality for the 8 European countries indicated bi-directional causality between economic growth and FDI, and unidirectional causality from economic growth and FDI to exports in the short-term. The empirical results of the Asian countries indicated bi-directional causality between exports and economic growth in

the short-term. Moreover, there is evidence of long-run causality from export and FDI to economic growth and long-run causality from economic growth and export to FDI for both of the panels.

3. Methodology

The theoretical basis for this macro-econometric model is hinged on the Keynesian and Mundell-Fleming IS-LM framework. The procedure for modeling the Nigerian economy sub-divided the economy in five interrelated blocks namely: production block, aggregate demand block, government block, external block and the financial or monetary block. The model contains 17 equations and is estimated using the Two-Stage Least Squares technique with a view to overcoming the problem of simultaneity that is inherent in a macro model. The macro –econometric model was further simulated employing the dynamic stochastic solution to overcome the long-run challenges other models are confronted with. The schematic framework that guided the specification of the macro-econometric model is presented in the following figure.

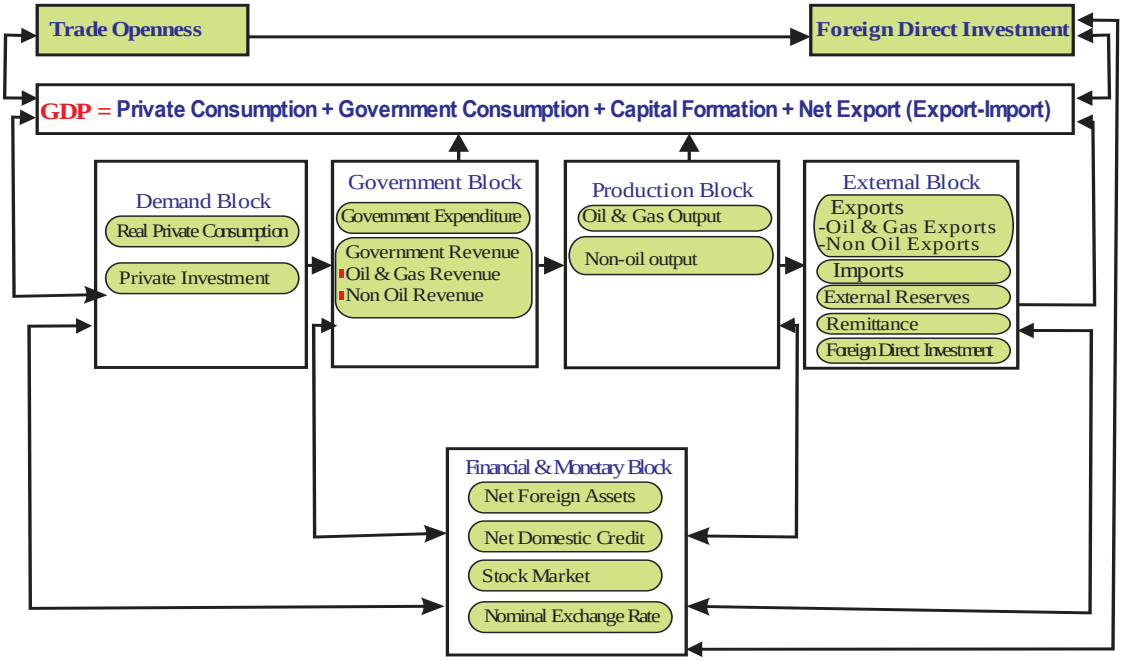


Figure 2: Schematic Framework for the Macro-econometric Model
Source: Authors' Compilation

3.1 Model Specification

On the bases of the schema model, the equations in the macro model are specified sector by sector based on theory; empirical strategy and the conventional knowledge of the Nigerian economy (see Appendix for the variable definitions). The schematic framework for the macro-econometric model is presented in the following figure.

The Production Block

Production activities are segregated into oil and non-oil following CEAR model MAC-IV of Olofin, Iyaniwura, Adeniyi and Olayide (1985); Agu (2010); and CBN (2013). In modeling the

production block, the Cobb-Douglas production function that incorporates the regular inputs of labour and capital was employed.

Oil and Gas Sub-sector

Oil and gas sub-sector production activities receive a large chunk of FDI and are dominated by foreign firms, hugely capital-intensive and import-dependent. Oil and gas production is a function of import of capital goods (*MK*), index of openness (OPN), oil price (*PO*), OPEC output (*OPEC*), foreign direct investment in the industrial sector (*FDII*), gross domestic product deflator for oil ($RGDP_O$).Therefore, the relevant specification for the oil sector becomes.

$$RGDP_O = f(MK^{\alpha 1}, OPN^{\alpha 2}, PO^{\alpha 3}, OPEC^{\alpha 4}, FDII^{\alpha 5}, RGDP_O(-1)^{\alpha 6}) \quad \text{-(1)}$$

Non-oil Sector

The non-oil sector embraces all other sectors of the economy besides oil and gas. Production in the non-oil sector is a function of credit to the private sector (CPS), Domestic maximum leading rate (DMR), non-oil foreign direct investment (FDIN), the index of electricity production (IEP), inflation rate (INF), and the import of intermediate goods (IMG).

$$RGDP_N = f(CPS^{\alpha 1}, DMR^{\alpha 2}, FDIN^{\alpha 3}, IEP^{\alpha 4}, INF^{\alpha 5}, MIG^{\alpha 6}) \quad \text{-(2)}$$

Aggregate Demand Block

In modeling the aggregate demand block following the Keynesian theoretical identity, this study captured only real private consumption and private investment.

Private Consumption

Following the Keynesian psychological law of consumption, the main determinants of household consumption in the literature are income and prices. Real private consumption (*PC*) is functionally related to real personal disposable income (*YD*), inflation rate (*INF*), real money balance (M_2), remittances (*RMT*), and the real private consumption deflator (PC_{t-1}).

$$PC = f(YD, INF, M_2, RMT, PC_{t-1}) \quad \text{-(3)}$$

Aggregate Investment

Private investment is specified in line with the accelerator and Keynesian theory which gives credence to the role of investment and cost of capital. Hence, private investment is determined by output variability (YV), consumer price index (CPI), real gross domestic product (RGDP), foreign direct investment (FDI), degree of openness (OPN), aggregate investment deflator (INV_{t-1}), and domestic maximum lending rate (DMR). The above relationship for aggregate investment is specified as:

$$INV = F(YV, CPI, RGDP, FDI, OPN, INV_{t-1}, DMR) \quad \text{-(4)}$$

Government Block

The modeling of the government block is predicated on the Keynesian public sector-led development strategy typical to developing countries. The specification of this block will be sub-divided into government expenditure and government revenue.

Government consumption expenditure

In modeling government consumption expenditure, only government recurrent expenditure is endogenised, capital expenditure is treated as a policy variable. Given that the size of government in Nigeria is huge relative to other sectors of the economy, its expenditure behavior often exhibits ratchet effect and incrementalism. Government recurrent expenditure (GRE) is therefore a function of total government revenue (GRV), credit to government by deposit money banks (CGDMB), public sector employment and inflation rate (INF), real gross domestic product (RGDP), and total debt services (TDS). Thus the specification is as follows.

$$GRE = f(GRV, CGDMB, INF, RGDP, TDS) \quad - \quad - \quad - \quad - \quad -(5)$$

Government Revenue

In line with budgetary and macroeconomic conventions, government revenue is classified into tax and non-tax receipts, the fundamental drivers and peculiarities of the Nigerian economy suggest a different classification of government revenue into oil and non-oil revenue. According to CBN (2013) this categorization is informed by the dominance of oil revenue in the basket of government receipts.

a) Oil and Gas Revenue

Government oil revenue (GRV_O) is a function of oil real Gross Domestic Product (RGDPo), oil exports (XO), oil price (PO), nominal exchange rate (NER), and petroleum profit tax (PPT). The specification here is given as follows:

$$GRV_O = f(RGDP_O, XO, PPT, NER, PO) \quad - \quad - \quad - \quad - \quad - \quad -(6)$$

b) Non-oil Revenue

Government non-oil revenue is a function of non-oil gross domestic product ($RGDP_N$), imports (M), oil revenue (GRV_O), external borrowing (EXB), tariff (*TAR*), and non-oil foreign direct investment (FDIN).

$$GRVN = f(RGDP_N, M, GRV_O, EXB, TAR, FDIN) \quad - \quad - \quad - \quad - \quad -(7)$$

External Block

The external block comprises of trade balance, current account, and capital account. Trade and service flows, transfers as well as foreign direct investments are endogenised, with an underlying small country assumption. Total trade consists of exports and imports. Exports are sub-divided into oil and non-oil exports, while imports are considered in aggregate.

1) ***Exports***

In line with Solodu (1995) exports in Nigeria are sub-divided into oil and non-oil exports. Oil exports are sensitive to domestic production, OPEC quota and price.

a) Oil and gas exports

Oil and gas exports (XO) are functionally determined by domestic oil production (YO), OPEC output (OPEC), index of openness (OPN), oil price (PO), and foreign direct investment in the industrial sector (FDII). The specification is stated as follows:

$$XO = f(YO, OPEC, OPN, PO, FDII) \quad - - - - - \quad -(8)$$

b). Non-oil exports

Non-oil exports (XN) are determined by non-oil gross domestic product ($RGDP_N$), nominal exchange rate (NER), credit to the private sector (CPS), and index of economic freedom (ECF), non-oil foreign direct investment (FDIN). The specification is as follows:

$$XN = f(RGDP_N, NER, CPS, ECF, FDIN) \quad - - - - - \quad -(9)$$

2) ***Imports***

Imports constituted a significant share of inputs for both domestic production and final consumption. on the whole, import (M) were determined by real gross domestic product (RGDP), nominal exchange rate (NER), domestic maximum lending rate (DMR), implicit tariff rate (TAR), and reserves (RES).

$$M = f(RGDP, NER, DMR, TAR, RES) \quad - - - - - \quad -(10)$$

External Reserves

External reserves in Nigeria depend crucially on the oil sector which is the main foreign exchange earner. Thus external reserves (RES) are functionally determine by real exchange rate (REXR), oil prices (PO), the volume of oil exports (XO), net export (NX) and external debt services (EDS). The external reserves model specification for this study is given as follows:

$$RES = f(REXR, PO, XO, NX, EDS) \quad - - - - - \quad -(11)$$

Remittance

Inward remittances (RMT) were specified as a function of interest rate differential (IRD), nominal exchange rate (NER), the ratio of stock market capitalization to GDP (SMK_Y), and macroeconomic stability (YV). The specification is as follows:

$$RMT = f(IRD, NER, SMK_Y, YV) \quad - - - - - - \quad -(12)$$

Foreign Direct Investment

In line with literature, Soludo, 1995; Akinlo 2004; and Okon et al 2012 foreign direct investment (FDI) in Nigeria were assumed to depend on nominal exchange rate (NER), real gross domestic product (RGDP), degree of trade openness (OPN), macroeconomic stability (YV), interest rate differential (IRD), and oil prices (PO). The specification for foreign direct investment is as follows:

$$FDI = f(NER, RGDP, OPN, YV, , IRD, PO) \quad - \quad - \quad - \quad - \quad -(13)$$

Financial Block

The financial or monetary sector in this model is in line with the LM equilibrium condition that money demands is equal to money supply and are determined by interest rate and level of income. This block comprises of four equations on net foreign assets, net domestic credit, stock market and nominal exchange rate.

Net Foreign Assets

Net foreign assets (NFA) of the banking system are the net position of the current account balance (CAB) plus the net capital inflow from the rest of the world to the economy. It is the channel through which international transactions impacts are transmitted to the domestic economic conditions. Theoretically, net foreign assets (NFA) are driven by external reserves (RES), nominal exchange rate (NER), interest rate differential (IRD), trade balance (TBL), and the index of economic freedom (ECF). The specification for the model is as follows.

$$NFA = f(, RES, NER, IRD, TBL, ECF) \quad - \quad - \quad - \quad - \quad -(14)$$

Net Domestic Credit

A distinctive feature of monetary survey of the economy consists of assets and liabilities sides. On the asset side, the net domestic credit (NDC) comprises the major part of total monetary assets. Domestic credit in this study is a function of monetary policy rate (MPR), money supply (M2), imports (M), and real gross domestic product (RGDP). The specification is as follows.

$$NDC = f(MPR, M2, M, RGDP) \quad - \quad - \quad - \quad - \quad - \quad -(15)$$

Stock Market

In line with the geometrical Brownian movement for modeling stock prices which takes into consideration continuous stock price and value development, the stock market proxy as the stock price (SKP) is specified as a function of the rate of return (INTR), foreign portfolio investment inflow (FPI), nominal exchange rate (NER), and macroeconomic stability (YV).

$$SKP = f(INTR, FPI, NER, YV) \quad - \quad - \quad - \quad - \quad - \quad -(16)$$

Nominal Exchange Rate

Nigeria's exchange rate policy had moved from a fixed to a fairly liberalized regime, with occasional intervention by monetary authorities. Hence, nominal exchange rate is modeled using a modified Uncovered Interest Parity (UIP). Nominal exchange rate is a function of real money supply (M2), interest rate differential (IRD), consumer price index (CPI), total government expenditure (TGE), oil price (PO), and the index of trade openness (OPN).

$$NER = f(M2, IRD, CPI, TGE, PO, OPN) \quad - \quad - \quad - \quad - \quad -(17)$$

3.2 Policy Scenarios

The four policy scenarios for this macro model were set in line with the Nigeria Economic Recovery and Growth Plan (ERGP) 2017-2020, which is aimed at restoring growth, investing in people and building a globally competitive economy. Scenario 1 considers a 5.54 per cent increase in the level of trade openness to impact on foreign direct investment inflow in Nigeria and other important macroeconomic variables. The second scenario entails 0.36 per cent increase in FDI inflow in Nigeria and its attendant influence on macroeconomic performance. The third scenario focused on 5.89 per cent increase in government expenditure as an optimal fiscal policy to simulate its impact on trade openness and its attendant impact on FDI inflow in Nigeria. The fourth scenario is 20.47 per cent change in money supply as an optimal monetary policy to simulate its impact on trade openness and its attendant impact on FDI inflow in Nigeria.

4. Results and Discussion of Findings

The model estimated for this study consist of five interrelated blocks namely the production block, aggregate demand block, government block, external block and the financial block with 17 equations. The estimation results and discussions are presented below.

Production Block

The estimates for the production block comprises of two equations namely oil and gas real output and non-oil real output. The results of the production block are presented in the following table.

Table 1: Model Estimation Results for the Production Block

RGDPO = 3.61 - 0.54 * MK + 1.04 * OPN + 0.06 * PO - 1.29 * OPEC + 0.87 * FDII + 0.53 * RGDPO(-1)						
(0.19)	(-7.79)	(2.52)	(3.19)	(-2.86)	(2.31)	(2.15)
Adjusted R-Square = 0.50			D.W = 1.77			
RGDPN = 7.38 + 1.55 * CPS + 0.54 * DMR - 1.71 * FDIN + 0.26 * IEP - 0.19 * INF + 0.69 * MIG						
(1.80)	(3.29)	(2.85)	(2.60)	(4.23)	(4.19)	(2.42)
Adjusted R-Square = 0.97			D.W = 2.02			

Source: Authors' computation using Eviews 9

Note: Values in parenthesis are the t-test ratios

The index of openness has a positive and significant relationship with oil and gas output in Nigeria; hence, 1 per cent increase in the index of openness would raise oil and gas real gross domestic product by 1.04 per cent. Foreign direct investment inflow into the industrial sector impacted positively and significantly on oil and gas real gross domestic product. The result showed that, 1 per cent increase in the inflow of foreign direct investment into the industrial sector would lead to 0.87 per cent increase in oil and gas real gross domestic product. This may

be attributed to the fact that foreign direct investment inflow to the oil and gas sector has a greater degree of positive impact on the sector. This finding is in tendon with that of Nwachukwu (2019) that Nigeria being an oil dependent economy, most of the FDI inflows are directed to the oil and gas sector where human capital and infrastructure plays a significant role.

Foreign direct investment into the non-oil sectors has a negative and statistically significant influence on non-oil GDP in Nigeria. The level of significance indicated that foreign direct investment into the non-oil sector has the potentials of influencing non-oil output in Nigeria though it has been inconsistent. This finding conforms to that of Wahab (2020) that non-oil FDI would spur growth in the non-oil sector if there is consistency in policy and no intervention by government, the inflows of non-oil FDI would bring about expansion in employment, more inclusive growth and development.

Aggregate Demand Block

The aggregate demand block contains two equations namely private real consumption and private investment. The results of the model estimations are presented in the following table.

Table 2: Model Estimation Results for the Aggregate Demand Block

PC = 1.57 + 0.24 * YD - 0.0002 * INF + 0.01 * M2 + 0.06 * RMT + 0.69 * PC(-1) - 0.09 * EXR

(0.89) (2.27) (1.79.) (2.20) (2.31) (2.34) (-4.33)

Adjusted R-Square = 0.89 D.W = 2.12

INV = 0.04 - 1.31 * YV + 0.19 * CPI + 0.19 * RGDP + 0.11* FDI + 0.71 * OPN + 0.39 * INV(-1) + 0.06 * DMR

(0.01) (-0.77) (3.97) (0.34) (4.84) (2.72) (2.51) (3.77)

Adjusted R-Square = 0.99 D.W = 2.32

Source: Authors' computation using Eviews 9

Note: Values in parenthesis are the t-test ratios

The result revealed that disposable income, broad money supply, remittance and the real private consumption deflators are positively and significantly related with real private consumption in Nigeria. These results mean that 1 per cent increase in disposable income, broad money supply, and remittance would trigger real private consumption by 0.24, 0.01, and 0.06 per cent respectively. Hence, real private consumption being a function of income will increase. Also, in the investment model, foreign direct investment and trade openness are positively related with private investment in Nigeria. These suggest that 1 per cent increase in foreign direct investment inflow and trade openness would increase investment activities in Nigeria by 0.11 and 0.71 per cent respectively. The increase in private investment accounted for as a result of trade openness and foreign direct investment inflows has the potentials of influencing the behavior of other macroeconomic variables. These findings conform to that of Ullah *et al* (2014) that the nexus between trade openness and FDI significantly affect domestic investment and consequently other macroeconomic variables.

The Government Block

In estimating the government block for the Nigerian economy, three basic components namely, government recurrent expenditures, oil and non-oil revenues were considered and the results are presented in the following table.

Table 3: Model Estimation Results for the Government Block

GRE = 2.79 + 0.85 * GRV + 0.50 * CGDMB + 0.25 * INF - 0.53 * RGDP + 0.20 * TDS
(2.58) (7.45) (2.07) (1.10) (-2.44) (3.22)
Adjusted R-Square = 0.97 D.W = 2.61

GRVO = - 5.90 + 2.34 * RGDPO + 0.17 * XO + 0.57 * PO - 0.54 * NER - 0.43 * PPT
(-2.76) (3.32) (2.60) (2.91) (-2.43) (-5.19)
Adjusted R-Square = 0.43 D.W = 1.95

GRVN = - 0.01 + 0.22 * RGDPN + 0.38 * M - 0.33 * GRVO + 0.35 * EXB - 0.08 * TAR + 0.41 * FDIN
(-0.03) (2.09) (2.84) (-2.48) (3.33) (-3.96) (2.40)
Adjusted R-Square = 0.99 D.W = 1.80

Source: Authors' computation using Eviews 9

Note: Values in parenthesis are the t-test ratios

The estimated results shows that total government revenue, credit to the government by deposit money banks, inflation and total debt services are positively related with government recurrent expenditure in Nigeria. The results revealed that 1 per cent increase in total government revenue, credit to the government by deposit money banks, inflation rate and total debt services would lead to 0.85, 0.50, 0.25, and 0.20 per cent increase in government expenditure respectively. This finding conforms to the study by NISER (2016) that historically, surge in government revenue provokes an expansion in government expenditure in Nigeria. Also, the positive relationship between government total revenue and government recurrent expenditure can be attributed to the role that FDI plays in the Nigerian oil and gas sector.

Furthermore, in the government oil revenue equation, oil output exerts a positive and significant effect on government oil revenue as does oil exports and oil price in Nigeria. The result showed that 1 per cent increase in oil output, oil export and oil price would lead to 2.34, 0.17, and 0.57 per cent increment in government oil revenue respectively. Similarly, the specification of government non-oil revenue retained revenue incorporated external and real sector variables – imports, tariff and domestic output. This was adopted to capture the significance of international taxes to the government as a source of revenue. Non-oil FDI and imports influenced government non-oil revenue positively, hence 1 per cent increase in non-oil FDI and imports would lead to 0.41 and 0.38 per cent increase in government non-oil revenue in Nigeria respectively.

The External Block

The external sector comprises five equations namely, oil export, non-oil export, import, external reserves, and foreign direct investment. Their estimated results are presented in the following table with the explanations.

Table 4: Model Estimation Results for the External Block

XO = - 9.40 + 8.86 * YO - 7.53 * OPEC + 0.57 * OPN + 0.45 * PO + 0.94 * FDII
(-1.11) (2.49) (-3.13) (2.06) (2.49) (3.65)
Adjusted R-Square = 0.96 D.W = 1.98

XN = - 7.55 + 1.00 * RGDPN + 0.04 * NER - 0.70 * CPS + 1.96 * ECF + 0.85 * FDIN
(-0.69) (2.89) (0.13) (-2.85) (4.49) (0.51)
Adjusted R-Square = 0.97 D.W = 2.40

M = - 0.78 - 0.14 * RGDP + 0.58 * NER - 0.34 * DMR - 0.12 * TAR + 0.39 * RES
(-0.57)(2.92) (2.28) (-2.91) (-1.26) (9.12)
Adjusted R-Square = 0.84 D.W = 1.89

RES = - 2.72 + 0.02 * REXR + 1.47 * PO + 1.05 * XO - 0.57 * NX + 0.17 * EDS
(-1.84) (2.05) (2.80) (3.87) (-2.85) (2.01)
Adjusted R-Square = 0.96 D.W = 2.11

FDI = 5.20 - 4.39 * NER + 1.68 * RGDP + 2.04 * OPN - 4.41 * YV - 2.39 * IRD - 1.88 * PO
(0.97) (-3.08) (1.95) (2.02) (-3.78) (-2.27) (-3.23)
Adjusted R-Square = 0.71 D.W = 2.03

Source: Authors' computation using Eviews 9

Note: Values in parenthesis are the t-test ratios

In the oil exports equation, the index of trade openness and FDI impacted oil and gas exports positively and are statistically significant. 1 per cent increase in the index of trade openness and inflow of foreign direct investment in the industrial sector would increase oil and gas exports in Nigeria by 0.57 and 0.94 percent respectively. This may be ascribed to the fact that, most of the FDI into the Nigerian economy are directed to the extractive industry and oil sector in particular. Different test statistics for the model confirmed the validity of the estimates. This is in line with the findings of Nwachukwu (2019) that FDI inflows contribute significantly to oil and gas exports in Nigeria.

The index for economic freedom and non-oil FDI indicated positive influence on non-oil export in Nigeria. This implies that 1 per cent rise in the index of economic freedom and non-oil FDI would increase non-oil export by 1.96 and 0.85 per cent respectively in Nigeria. However, non-oil FDI was not statistically significant. The statistically insignificant relationship may be attributed to the minimal inflow of foreign direct investment into the non-oil sector and the poor state of infrastructure. This conform with the study by Bayar (2016) that economic freedom, and FDI inflows impacts an economy positively and the effect depends on the ability of the countries to develop their technology as well as infrastructure.

In the foreign direct investment equation, the index of trade openness and real gross domestic product impacted foreign direct investment positively and are statistically significant; hence, 1 per cent rise in the index of trade openness and real gross domestic product would induce FDI inflow by 2.04 and 1.64 per cent into Nigeria respectively. This finding confirmed the a priori expectation that increase in the level of openness and productive activities in the real sector of the economy attracts foreign direct investment.

Financial/Monetary Block

In the financial/monetary block, six stochastic equations namely, net foreign assets, net domestic credit, money demand, domestic maximum lending rate, stock market price and nominal exchange rate.

Table 5: Model Estimation Results for the Financial/Monetary Block

NFA = - 2.42 + 1.05 * RES + 1.61 * NER + 0.89 * IRD + 2.45* TBL - 1.28 * ECF
(-0.18) (5.66) (1.97) (2.52) (1.93) (-2.80)
Adjusted R-Square = 0.93 D.W = 1.99

NDC = - 3.11 + 3.53 * MPR - 0.18 * M2 + 2.10 * M + 0.65 * RGDP
(-1.11) (4.38) (-3.03) (7.83) (2.09)
Adjusted R-Square = 0.82 D.W = 1.69

SKP = - 2.75 + 0.53 * INTR + 0.69 * FPI + 0.87 * NER - 6.83 * YV
(-0.93) (2.42) (3.42) (3.12) (-1.09)
Adjusted R-Square = 0.52 D.W = 2.29

NER = 4.78 - 0.16 * M2 - 0.89 * IRD + 0.27 * CPI - 0.20 * TGE -0.25 * PO + 0.14 * OPN
(3.88) (-3.19) (-4.69) (1.31) (-2.01) (-2.08) (2.76)
Adjusted R-Square = 0.63 D.W = 1.91

Source: Authors' computation using Eviews 9

Note: Values in parenthesis are the t-test ratios

In the financial/monetary block, trade balance showed a positive and statistically significant relationship with the net foreign assets in Nigeria. This implies that 1 per cent increase in trade balance would induce net foreign assets in Nigeria by 2.45 per cent. This is in line with a priori expectation and it signifies a rise in net foreign assets and ultimately the money stock. The index for economic freedom has a negative and statistically significant impact on net foreign assets in Nigeria. This suggests that 1 per cent increase in the index of economic freedom would reduce net foreign assets by 1.28 per cent. This may be attributed to the difficult business environment in Nigeria which has discouraged foreign investors. But the level of statistical significance indicates the potentiality of the index of economic freedom in determining the net foreign assets in Nigeria. This finding is contrary to that of Bayar (2016) that economic freedom impacts the economy positively. Foreign portfolio investment also impacted stock market price positively and statistically significant in Nigeria. The result revealed that 1 per cent increase in the inflow of foreign portfolio investment would induce stock market activities by 0.69 per cent. These reflect investors' confidence in the market and it conforms to a priori expectation.

Validation of the Estimated Model

In carrying out the simulation experiment, the model was evaluated using graphical and statistical approaches. It is expected that the actual values of the endogenous variables tracked with the simulated values. Hence, the actual and the simulated paths of the endogenous variables were plotted together and are presented in the following figure.

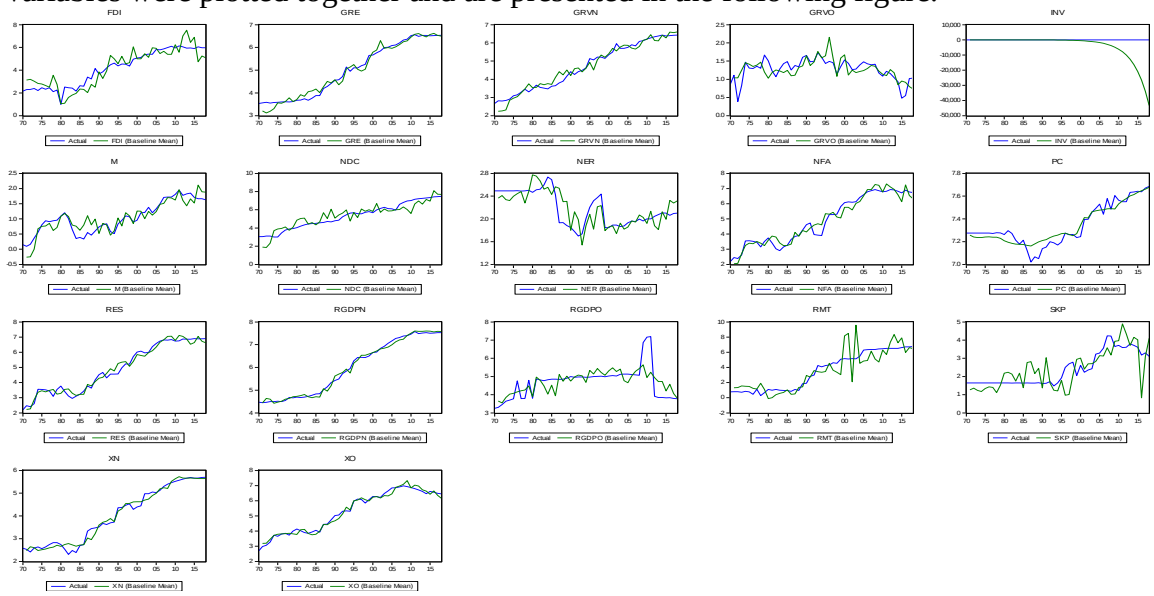


Fig 3: Baseline Simulation of the Endogenous Variables

A cursory examination of the graphs indicated that the model tracked the time paths and the turning points of the endogenous variables reasonably well. This was a good indication that the model captured the working of the Nigerian economy with respect to the behavior of the variables of interest and, suggested its suitability for policy simulation.

Furthermore, the model validation statistics that were used to validate the performance of the model are presented in the following table.

Table 6: Summary Statistics of Model Validation

Equation	Root Mean Squared Errors	Theil's Inequality Coefficient	Bias Proportion	Variance Proportion	Covariance Proportion
RGDPO	**0.2816**	**0.0306**	**0.0003**	**0.1783**	**0.8214**
RGDPN	**0.0869**	**0.0072**	**0.0000**	**0.0014**	**0.9986**
HFC	**0.0632**	**0.0043**	**0.0000**	**0.1467**	**0.8533**
INV	**0.0997**	**0.0131**	**0.0324**	**0.0046**	**0.9631**
GRE	**0.1482**	**0.0147**	**0.0000**	**0.0043**	**0.9957**
GRVO	**0.1978**	**0.0756**	**0.0000**	**0.1555**	**0.8445**
GRVN	**0.1038**	**0.0108**	**0.0000**	**0.0018**	**0.9982**
XO	**0.1719**	**0.0159**	**0.0000**	**0.0042**	**0.9958**
XN	**0.1502**	**0.0183**	**0.0000**	**0.0041**	**0.9959**
M	**0.1787**	**0.0796**	**0.0000**	**0.0327**	**0.9672**
RES	**0.2344**	**0.0232**	**0.0000**	**0.0059**	**0.9941**
RMT	**1.1286**	**0.1381**	**0.0000**	**0.0633**	**0.9367**
FDI	**0.4483**	**0.0512**	**0.0000**	**0.0241**	**0.9759**
NFA	**0.1625**	**0.0161**	**0.0000**	**0.0027**	**0.9973**
NDC	**0.4706**	**0.0434**	**0.0000**	**0.0337**	**0.9663**
SKP	**0.4567**	**0.0921**	**0.0000**	**0.0782**	**0.9218**
NER	**0.1373**	**0.0312**	**0.0000**	**0.0607**	**0.9393**

Source: Authors' Computation.

The results of the test statistics on Root Mean Squared percentage Error (RMSE); Theil's inequality, bias proportion and variance proportion, between the simulated values and the endogenous variables showed low coefficients. This implies that the discrepancies between the actual and the forecasted values of most variables are not predicated by the differences in the mean values or the variance of the endogenous variables. The Covariance's are high, thus the actual and simulated values co-move. The implication of the result is that the model is suitable for forecasting and policy simulation in the Nigerian.

Simulation Results

There were four policy scenarios employed for the simulation in the study: increase in the index of trade openness, increase in FDI inflow, increase in government expenditure and increase in money supply. The results of the four policy scenarios are presented in the following tables.

Table 7: Estimated Results for the Four Policy Scenarios

Variables	5.54% increase in Openness		36% increase in FDI		5.89% increase in Government Expenditure		20.47% increase in M2	
	Within	Forecast	Within	Forecast	Within	Forecast	Within	Forecast
FDI	**3.12**	**4.24**	**-**	**-**	**3.12**	**3.33**	**3.13**	**3.33**
HFC	**6.33**	**6.40**	**3.86**	**2.91**	**6.33**	**6.35**	**6.33**	**6.35**
INV	**4.07**	**4.30**	**8.82**	**10.9**	**4.12**	**4.26**	**4.12**	**4.26**
GRVN	**3.70**	**3.82**	**6.62**	**7.92**	**3.67**	**3.79**	**3.67**	**3.79**
GRVO	**0.27**	**0.22**	**1.76**	**2.61**	**0.29**	**0.25**	**0.29**	**0.25**
GRE	**3.95**	**4.10**	**3.95**	**4.08**	**-**	**-**	**3.95**	**4.08**
YO	**3.79**	**3.74**	**23.9**	**31.8**	**3.75**	**3.69**	**3.76**	**3.70**
YN	**4.96**	**5.10**	**4.96**	**5.10**	**4.94**	**5.07**	**4.94**	**5.07**
XN	**2.96**	**3.10**	**2.42**	**3.42**	**2.95**	**3.08**	**2.95**	**3.08**
XO	**4.24**	**4.31**	**8.30**	**9.97**	**4.27**	**4.33**	**4.27**	**4.33**
M	**0.01**	**0.06**	**5.98**	**8.38**	**0.02**	**0.05**	**0.02**	**0.05**
RES	**3.81**	**3.94**	**7.51**	**9.09**	**3.85**	**3.97**	**3.85**	**3.97**
NFA	**3.84**	**3.93**	**19.5**	**25.7**	**3.89**	**3.92**	**3.87**	**3.92**
SKP	**1.37**	**1.40**	**9.68**	**12.9**	**1.36**	**1.36**	**1.35**	**1.36**
NER	**22.9**	**25.9**	**43.9**	**64.4**	**1.17**	**1.16**	**1.17**	**1.16**

Source: Authors' Computation.

The simulation results for the first scenario which is the impact of 5.54 per cent increase in the index of trade openness showed that, increase in the index of trade openness would attract foreign direct investment inflows into the Nigerian economy by 3.12 per cent within the sample experiment. The result further indicated that trade openness would increase the inflow of foreign direct investment by 3.24 per cent for the remaining period of the out-of-sample forecast. This may be ascribed to the fact that Nigeria is a capital scarce economy; therefore given a relative increase in the level of trade openness, more foreign direct investment inflow would be attracted into the economy. Also, the comparative advantage of the economy in terms of natural resources endowment such as crude oil, human resource and other mineral resources has attracted inflow of foreign direct investment into the Nigerian economy over the years. This conforms to the findings of Zaman *et al* (2018) that higher level of trade openness has significant positive impact on FDI inflows into the economy.

The simulation results of the second scenario which is the impact of 0.36 per cent increase in foreign direct investment inflow in Nigeria on some selected macroeconomic variables reveals both the direct and indirect effects of the variables of interest. The simulation experiment showed that 0.36 per cent increase in FDI would increase private investment, oil output, and non-oil output by 8.82, 23.87, and 4.96 from the within sample respectively. When forecasted up to 2023, increase in FDI inflow would private investment, oil output and non-oil output by 10.87, 31.8 and 5.10 per cent respectively. Furthermore, 0.36 per cent increase in FDI inflow would increase oil exports, non-oil exports and stock market by 8.30, 2.42 and 9.68 per cent from within sample. When forecasted up to 2023, oil exports, non-oil exports and stock market would increase by 9.97, 3.42 and 12.9 per cent respectively. This finding is in line with Jawaid

and Waheed (2018) that increase in FDI is growth enhancing and that all sectors of the economy would grow. Increase in the inflows of FDI as forecasted would stimulate the behavior of macroeconomic variables such as private investment and consequently enhance domestic output growth, especially in the tradable sectors of the economy.

The results of the third simulation scenario shows that 5.89 per cent increment in government expenditure would increase the index of trade openness and FDI inflow by 0.65 and 3.12 per cent from the within sample respectively. When forecasted up to 2023, the index of trade openness and FDI would increase by 0.70 and 3.33 per cent respectively. These increases may be attributed to the strategies embacked upon by the government to cushion the effects of economic crisis and recession especially, by way of increasing supply of funds into critical physical infrastructure, human capital development and implementation of sectoral reforms. These validates the studies by Azolibe *et al* (2020) and Fogel (2006) that for an economy to achieve the desired objective of quadrupled rate of GDP, improvement in funding critical infrastructures such as quality education, defense, energy, roads transport, and other institutions must be given attention in order to open up the economy and attract FDI inflows.

The simulation results for 20.47 per cent increase in broad money supply shows that, the index of trade openness, FDI inflow and private investment would increase by 0.65, 3.13 and 4.12 per cent from within sample respectively. The out-of-sample forecast showed that trade openness, FDI and private investment would increase by 0.69, 3.33 and 4.26 per cent respectively. The implication of the results is that, increase in money supply will enable the opening of tradable sectors (like agriculture, manufacturing and services) and this has the possibility of enhancing output growth and consequently FDI inflow in the economy. This finding conforms to the work of Dogga *et al* (2014) that financial openness and money supply in particular create a sustained domestic demand which stimulate FDI inflow and consequently increase in the level of traded sectors.

5. Conclusions and Policy Recommendations

This study set out to investigate the impact of trade openness and foreign direct investment on some macroeconomic variables in Nigerian. This is particularly important in view of the diversification drive by the government as encapsulated in the Economic Recovery and Growth Plan (ERGP) to meet its trade obligation by building a globally competitive economy. A macro econometric model was employed to achieve the objective of this study. The findings suggest that the level of trade openness attracts foreign direct investment into the Nigerian economy and they jointly affect macroeconomic performance in Nigeria through direct and indirect channels. The simulation experiments conducted established various gains that increase in the level of trade openness and foreign direct investment would have on the performance of macroeconomic variables in Nigeria such as increase in private investment, real consumption, outputs of oil and non-oil, government revenue among others; also increase in government expenditure and money supply as fiscal and monetary policy mix impacted positively on foreign direct investment and the level of trade openness in Nigerian. The behavior of some macroeconomic variables such as non-oil exports and revenue are not as expected and this is as a result of the dominance of oil.

However, this study lends support to effective trade openness strategies that allows the opening of traded sectors and free flow of goods and services as well as inflow of foreign direct investment as a necessary condition for macroeconomic economic performance. Also, creating

the enabling environment for business and productive activities to strive through manipulating contemporaneously monetary and fiscal measures, this is believed to be the major stimulus to the performance of macroeconomic variables.

On the basis of the findings, this study makes the following recommendations: First, in line with the ERGP government should build a competitive economy by investing more in critical infrastructures such as power, roads, rail, ports, and broadband network. This will improve the infrastructural backbone of the country and will attract more foreign investors into the economy. This can be done through Public Private Partnership (PPP) arrangement. Second, government should ensure the implementation of the ease of doing business by consolidating on the efforts of the Presidential Enabling Business Environment Council (PEBEC) as an incentive to domestic and foreign investors. This can be done through institutional or regulatory reforms, friendly tax reforms, property right, concessionary interest rates, and by resolving insolvency. Third, the diversification of the economic base from oil to non-oil sector should be pursuit vigorously. This can be done by ensuring that revenue realized from oil and gas sector are channeled to the real sector and non-oil sector in particular where local content and import substitution will be promoted. For effective revenue mobilization from the oil sector to the non-oil sector, the government should ensure quick passage of the Petroleum Industrial Bill (PIB) into law; where petroleum equalization fund should be scrapped in order to recoup revenue leakages and to further checkmate the activities of Multinational companies that tend to defraud the Nigerian government of her revenue. Fourthly, in order to combat the continuous export of narrow range of goods, mostly primary commodities in both oil and non-oil sectors with less value addition, the Nigeria Export Promotion Council (NEPC) and the Bank of Industry (BOI) should revamped exports incentive schemes to domestic producers to encourage and increase value addition to our primary products and exports. Finally, the Centre Bank of Nigeria (CBN) should ensure macroeconomic stability as a strategy for trade openness and attraction of foreign direct investment. This can be done by increasing money supply in the economy by way of reducing the monetary policy rate as a signal. This will make available capital for investment that if properly managed will improve the capital base and productive capacity of our producers for exports.

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7. Appendix I: VARIABLES DEFINITIONS, TYPE AND UNITS

Notation	Definition	Type	Unit
ASI	**All Share Index**	**Exogenous**	**Index**
CGDMB	**Credit to Government by deposit Money Banks**	**Exogenous**	**Million Naira**
CPI	**Consumer Price Index**	**Exogenous**	**Index**
CPS	**Credit to the Private Sector**	**Exogenous**	**Million Naira**
DDS	**Domestic Debt Stock**	**Exogenous**	**Million Naira**
DDSK	**Domestic Debt Stock**	**Exogenous**	**Million Naira**
DMR	**Domestic Maximum Leading Rate**	**Endogenous**	**Per cent**
ECF	**Degree of Economic Freedom**	**Exogenous**	**Index**
EDS	**External Debt Service**	**Exogenous**	**Million Naira**
EXB	**External Borrowing**	**Exogenous**	**Million Naira**
FDI	**Foreign Direct Investment**	**Endogenous**	**Million Naira**
FDII	**Foreign Direct Investment in the Industrial**	**Exogenous**	**Million Naira**
FDIN	**Sector**	**Exogenous**	**Million Naira**
FIR	**Non-oil Foreign Direct Investment**	**Exogenous**	**Per cent**
FPI	**Foreign Interest Rate**	**Exogenous**	**Million Naira**
FTD	**Foreign Portfolio Investment**	**Identity**	**Million Naira**
GRE	**Foreign Trade**	**Endogenous**	**Million Naira**
GRV	**Government Recurrent Expenditure**	**Identity**	**Million Naira**
GRVN	**Total Government Revenue**	**Endogenous**	**Million Naira**
GRVO	**Non-oil Government Revenue**	**Endogenous**	**Million Naira**
INFe	**Oil Government Revenue**	**Exogenous**	**Per cent**
INF	**Inflation Expectation**	**Exogenous**	**Per cent**
INV	**Inflation Rate**	**Endogenous**	**Million Naira**
IRD	**Investment**	**Exogenous**	**Per cent**
INTR	**Interest Rate Differential**	**Exogenous**	**Per cent**
IEP	**Interest Rate**	**Exogenous**	**Index**
M	**Index of Electricity production**	**Identity**	**Million Naira**
MD	**Imports**	**Endogenous**	**Million Naira**
MIG	**Demand for Money**	**Exogenous**	**Million Naira**
MK	**Import of Intermediate Goods**	**Exogenous**	**Million Naira**
MPR	**Import of Capital Goods**	**Exogenous**	**Per cent**
M2	**Monetary Policy Rate**	**Exogenous**	**Million Naira**
NDC	**Money Supply**	**Endogenous**	**Million Naira**
NER	**Net Domestic Credit**	**Endogenous**	**Per cent**
NFA	**Nominal Exchange Rate**	**Endogenous**	**Million Naira**

NX	**Net Foreign Assets**	**Identity**	**Million Naira**
OPN	**Net Exports**	**Endogenous**	**Index**
OPEC	**Index of Trade Openness**	**Exogenous**	**Million Naira**
PO	**Oil Production by OPEC Quota**	**Exogenous**	**Million Naira**
PPT	**Oil Price**	**Exogenous**	**Million Naira**
PC	**Petroleum Profit Tax**	**Exogenous**	**Million Naira**
RGDP	**Private Investment**	**Exogenous**	**Million Naira**
RGDPN	**Real Gross Domestic Product**	**Endogenous**	**Million Naira**
RGDPO	**Non-oil Real Gross domestic Product**	**Endogenous**	**Million Naira**
RES	**Oil Real Gross Domestic Product**	**Endogenous**	**Million Naira**
REXR	**External Reserves**	**Exogenous**	**Per cent**
RMT	**Real Exchange Rate**	**Endogenous**	**Million Naira**
SKP	**Personal Remittance**	**Endogenous**	**Index**
SMKY	**Stock Prices**	**Exogenous**	**Per cent**
TAR	**Stock Market Capitalization**	**Exogenous**	**Per cent**
TBL	**Tariff Rate**	**Exogenous**	**Million Naira**
TDS	**Trade Balance**	**Identity**	**Million Naira**
TGE	**Total Debt Service**	**Identity**	**Million Naira**
X	**Total Government Expenditure**	**Identity**	**Million Naira**
XN	**Total Exports**	**Endogenous**	**Million Naira**
XO	**Non-oil Exports**	**Endogenous**	**Million Naira**
YD	**Oil Exports**	**Exogenous**	**Million Naira**
YV	**Real Personal Disposable Income**	**Exogenous**	**Per cent**
	Macroeconomic Variability		