AN EXAMINATION OF THE IMPACT OF MACROECONOMIC POLICIES ON DOMESTIC INVESTMENT IN NIGERIA

[1]Udo N. Ekpo; [2] Inibeghe M. Okon and [3]Ekere J. Daniel

Department of Economics
Akwa Ibom State University,
Ikot Akpaden, Nigeria.
udonekpo@yahoo.com; udonekpo@aksu.edu.ng

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Abstract

Investment is the mainstream of economic growth and development of a nation. Investment decision and activities in a country is greatly influenced by macroeconomic policies and outcomes. This paper examined the impact of macroeconomic policies variables on gross domestic investment in Nigeria for the period (1981-2021) using the econometric techniques of Ordinary Least Square and error correction model for analysis. The result revealed that national income, government capital expenditure and external debt had positive and significant impact on domestic investment. Also, interest rate and market size had positive but insignificant effects on domestic investment. Both exchange rate and inflation rate had negative but insignificant relationship with domestic investment. This study therefore, concludes that macroeconomic policies affect domestic investment in Nigeria, and the drivers of domestic investment in Nigeria in relation to macroeconomic policies as identified in this study are national income, government expenditure especially capital expenditure, interest rate and external debts while volatile exchange rate and inflation rate exerted negative effect. Based on the findings, it is recommended that government policy should be directed toward expanding the productive base of the economy in order to reduce unemployment, increase output and income in the economy, and consequently increase national income to boost investment. Government should ensure that capital expenditure forms the bulk of total government expenditure and should be prudently employed in the provision of economic and social overhead capital (infrastructure) which is known for complementing private investment. To minimize uncertainty, fiscal policy in the country should be complemented with effective monetary policy in order to handle inflation rate and interest rate issues, and exchange rate management should be intentionally geared toward ensuring relative stability of exchange rate.

Keywords: Domestic investment, Macroeconomic policy, Ordinary Least Square, Nigeria.

Introduction

Investment involves postponement of present consumption and commitment of resources by economic agents (individuals, firms and government) to acquire (or produce) real capital goods which will yield a future flow of goods and services with the hope of receiving adequate risk premium (returns) overtimes. In a country, investment is that part of national income not spent on consumption but expended on acquisition of real capital goods for further production of goods and services. As a crucial variable in both the demand and supply sides of the economy, investment plays vital roles in the functioning of the economy and is a principal variable necessary for economic growth and development of a country.

As a component of aggregate demand, investment encompasses physical capital accumulation undertaken by business firms overtime, such as the real capital goods (that is, building of new

factories and offices, acquisition of new machinery and equipment), and investing in new techniques and products to enable industries supply a greater quantity of sophisticated products and services to the consuming public. It also consists of government outlays on the provision of economic and social overhead capital (infrastructure) including good road networks, electricity supply, communications, waterways, airports, and on human capital development, such as all the inherent and acquired production abilities of a country's nationals through education, on-the-job training, health, housing, etc., which contribute to upgrading and enhancing productivity and general living standard in the country. As a channel which brings about increase in the real capital stock which expands a country's productive capacity, investment is also an important variable on the supply side of the economy.

Both empirical studies carried out in developing and developed economies (Soludo, 1998; Green and Vilanuena (1991) and growth theories have indicated the existence of a strong correlation between investment and economic growth. Soludo (1998) asserted that all growth models had come to accept that the rate of growth of an economy is determined by the accumulation of physical and human capital, the efficiency of resource use and the ability to acquire and apply modern technology. He also stressed that physical and human capital accumulations can only take place through net investment. Similarly, Development economists had emphasized the critical role of domestic investment in the sustenance and strengthening of investment-growth chain in developing countries. Scott (1991) acknowledged the crucial role of investment in economic development and asserted that the keyword for economic growth and development is investment.

According to him, growth is proximately caused by only two things: material investment and growth of quality-adjusted employment, which includes the effect of investment in human capital. Similarly, premised on the fact that investment enlarges the productive capacity of the economy, as far back as the early sixties, Nurseke (1966) had stressed that the vicious circle of poverty in developing countries can be broken through domestic investment. The spin-off of investment is the establishment of different types of industries and rendering of differs services, creation of jobs, production of varieties of goods, increase in national output and income, improvement in economic welfare and standard of living of the residents, and reduction in poverty. Domestic investment also ensures fuller utilization of available resources in a country through accumulation of physical and human capital on a sufficient scale for exploitation of national resources. By providing machines, tools, equipment and infrastructure for the growing labor force as well as improving the capability of the labour force through training, research and development, investment enhances innovations and technical progress which promotes economies of large-scale production, increased specialization and productivity, and consequently economic growth.

As crucial as investment is to economic growth and development of a country, available data on the trend of investment in Nigeria indicates that the growth rate of investment in Nigeria had been sluggish and the level of domestic investment is low. In the 1970s and early 1980s, there was hike in investment, especially by the public sector due to the oil boom experienced in the country. However, with collapse of the oil market in the mid1980s, investment fell and the level of domestic investment in the country eroded. Though the level of investment increased marginally during the Structural Adjustment Programme (SAP) era, it was short-lived. Nigeria has one of the world's lowest investment ratios and lowest productivity of capital, and has been classified as low savings and even lower investment economy (Ajaikaiye, 2003; Ali and Mshelia,

2007). Investment/GDP ratio was about 10% of GDP from the mid - 1980 to 1989, 6.33% in 1990, 4.95% in 1995 and 5.40% in 1999 (Ajakaiye, 2003). Based on data from CBN (2012), gross capital formation/GDP ratio was 12.19% in 2000, 7.10% in 2005, 17.93% in 2010 and, 14.97% and 11.26% in 2011 and 2012 respectively. In terms of the composition of gross capital formation, building and construction accounted for about 70% of the total between 1990 and 1999 while machinery and equipment largely required by the manufacturing sector peaked at 21% in 1993 and since then it has been declining (Ajaikaiye, 2003). Private investment share of gross investment in Nigeria had remained at about 25%, against an average of 60% for comparatively endowed countries such as Indonesia, Venezuela and Malaysia.

The literature on determinants of investment indicates that among the traditional factors which affect business fixed capital formation include marginal efficiency of capital, marginal revenue of capital, the user cost of capital, marginal adjustments cost of investment (Harchaoui, et. al, 2005; Ekpo, 2014). In addition to these traditional factors, investment decision and activities in a country is greatly influenced by macroeconomic policies and outcomes. The works of Pindyck (1991), Greene and Villanueva (1991) and Serven and Solimano (1991) show that macroeconomic policy (monetary, fiscal and exchange rate), uncertainty, irreversibility, macroeconomic instability and investment incentives affect investment decisions and performance. Similarly, Pfefermann and Madarassy (1992) identified determinants of investment, especially foreign direct investment, to include the size of domestic market, capacity utilization, fiscal deficits, inflation rate, exchange rate volatility, interest rates, macroeconomic policies and institutional factors.

Indisputably, macroeconomic policies (monetary, fiscal and exchange rate policies) and outcomes greatly affect investment decisions and performance. Monetary, fiscal and exchange rate policies affect investment through their effects on macroeconomic variables such as inflation rate, exchange rate, interest rate, money supply, public expenditure and receipts (taxes), budget deficit, public debt (external and domestic debts), debt service ratio and credits to the economy (credit to private and public sectors). These variables strongly affect both the rate of savings and investment. Amazingly, the macroeconomic policies outcomes in Nigeria in recent years have been characterized with high rate of inflation, huge public debt stock (domestic and external) and debt services burden, unstable exchange rate with wide swing and volatility and persistence budget deficit. These macroeconomic policies outcomes, in addition to causing unstable macroeconomic environment, create an atmosphere of uncertainty in the economy. As it has been acknowledged by the World Bank (1994), it is a stable macroeconomic environment characterized by low inflation rate, relatively stable exchange rate, manageable internal and external debt and quick resolution of shocks or crises as was the case of high performing Asian economies that engenders high rates of real capital accumulation and strong productivity growth rate.

Unequivocally, uncertainty strongly affects investment because of irreversibility of investment. Iyoha (1998) identified causes of uncertainty in the economy to include macroeconomic policies outcomes like high and unpredictable inflation and price variability, uncertain demand or fluctuating real output, exchange rate variability, interest rate volatility, foreign debt burden and macroeconomic instability arising from external shocks, incomplete credibility of policy reforms and socio-political instability. An atmosphere of uncertainty in the economy engenders the “wait -and-see” strategy and “postponement” of investment behaviour among investors. The prevalence of macroeconomic instability and uncertainty in Nigeria is not in doubt. The objective

of this study is to examine empirically the impact of macroeconomic policies variables on domestic investment in Nigeria for the period (1981 - 2021) using Ordinary Least Square (OLS) method of analysis.

This study becomes necessary in order to provide further empirical evidence on the impact of macroeconomic policies variables on gross domestic investment in Nigeria in line with new trends and directions in investment theory as pertains to Less Developed countries (LDC). The remaining part of this paper is organized thus: Section 2 reviews relevant literature on the determinants of investment. The methodological approaches adopted in the study are presented in section 3 while section 4 elaborates on empirical results. Finally, section 5 provides recommendations and conclusion.

2. Review of Related Literature

2.1 Conceptual Framework

Generally, investment refers to accumulation of real capital goods. It is an expenditure made to increase the capital stock in the economy, by acquiring more capital-producing assets and assets that can generate more output and income within the domestic economy.Ekpo (2015) described investment as the process of incremental change in capital stock whereby households, business firms and the government set asides resources to acquire (or produce) capital assets with the hope of enhancing future streams of earnings, increase productivity, and efficiency and improve the standard living of the people. Fakiyesi (1998) also perceived investment as the process of incremental change in capital stock whereby a society set aside part of its current productive resources to create material and human capital. The implication, therefore, is that, for investment to take place there must be a trade-off of present consumption for the future one and certain amount of resources must be transferred from one employment to another. Hence, investment requires forgoing of present consumption and commitment of resources which could have been used for present consumption to acquire real capital goods for further production of goods and services.

In every economy, there are two components of investment: private investment and public investment. Public investment is outlay of the government in the provision of economic and social overhead capital such as communication, educational and health-care facilities and services, security, construction of dams, roads, railways, drainages and parks, electricity supply, real estate activities and other activities like research and development that support improvement in the real sector of the economy (Ekpo, 2011). Private investment, on the other hand, is generally conceptualized in terms of physical capital formation. It encompasses investment in physical capital undertaken by business firms and individuals to accumulate, overtime, real capital goods such as fixed capital goods like new machinery, tools and equipment, new factories and offices, and other durables goods, investing in research and development of new techniques of production and products with the sole aim of improving the quality and quantity of the output and make more profit, working capital such as cash, stock of raw materials and inventories (Soludo, 1998; Ekpo, 1999).

Private investment can be categorized into domestic private investment and foreign private investment. Foreign private investment is made up of foreign direct investment and portfolio

investment. Whereas foreign direct investment (FDI) is foreign investment on tangible asset, portfolio investment is foreign investment on shares, bonds, securities and stock (Duruechi and Ojiegbe, 2015). Private investment can take the form of business fixed investment, residential and real estate investment, inventory investment and financial investment. While business fixed investment involves purchases of new capital goods by business firms for use in further production of goods and services, inventory investment refers to change in the stock of raw materials in the warehouse of the firms, semi-finished goods to be processed into final goods and finished-products yet to be sold by the firms. The expenditure on construction or purchase of new houses for both residential and rental purposes is residential and real estate investment. The gross domestic private investment of a country constitutes a combination of business fixed investment, inventory investment and real estate and residential investment. The combination of gross domestic private investment and public investment is normally referred to as Gross domestic investment (or Gross Capital Formation (GCF)). The World Bank (2019) described gross capital formation as outlays on addition to fixed assets of the economy plus net changes in the level of inventory. According to them, fixed assets include land improvement, plant, machinery and equipment purchases, construction of roads, railways, schools, offices, hospitals, private dwellings, and commercial and industrial buildings.

Arguably, macroeconomic policies and outcomes affect investment decisions and performance. In macroeconomic management, the principal macroeconomic policies often employed are monetary and fiscal policies. Monetary policy is a package of actions designed to influence the level and growth of money supply as well as the cost of credit (that is interest rate) in the economy in line with the expected level of economic activity to attain macroeconomic goals of growth and development. Fiscal policy, on the other hand, is the discretionary changes in the level, composition and timing of government expenditure and taxation. In recent times, exchange rate movements (or exchange rate policy)has been found to exert influences on investment decisions and outcomes. Exchange rate policy involves choosing an exchange system and determining a particular exchange rate at which foreign transactions take place in a country in order to stimulate the productive sectors, curtail inflation, ensure internal balance, improve the level of exports and attract foreign private investment and other capital flows, (Anyanwu, et al, 1995; Oladapo and Oloyede, 2014; Ekpo, 2023). Others macroeconomic policies which affect investment are commercial/trade policy, income policy, debt management policy, interventionists and institutional reform policies (Ekpo, 2014).

2.2 Theoretical Framework

The pioneer theoretical framework on investment behaviour could be traced to Keynes investment theory. He posited that investment depends on the marginal efficiency of capital (MEC) and interest rate. MEC is the rate of profit which an addition of extra unit of capital goods to economy's stock of capital is expected to yield. It is determined by the supply price of a capital asset and its prospective yields during it whole life span. Investment is regarded as profitable when the expected rate of profit is greater than the current market rate of interest. Keynes further stressed on the volatility of investment, especially private investment, because of uncertainty of return on investment (Ahuja, 2011).

Other major theories of investment include the neoclassical theory, the accelerator theory, loanable funds theory, the liquidity theory, expected profit theory, Tobin's Q theory and the Debt Overhang hypothesis (Oshikoya, 1994; Bogunjoko, 1998; Ekpo, 2015). The neoclassical theory focuses on profit maximization, the primary motive of investment. It postulates that addition to

the stock of capital goods depends on the marginal product of capital (MPC) and the user cost of capital. MPC, the extra amount of output that can be produced by using an extra unit of capital good, determines the contribution that an extra unit of capital good makes to profit. The user cost of capital is the cost of using more capital goods and is determined by nominal interest rate, expected rate of inflation, rate of depreciation, corporate income taxes and investment tax credit. The accelerator theory, which is based on the fact that the demand for capital goods is derived from the demand for consumption goods, posits that when the demand for consumer goods rises, there will be an increase in the demand for capital goods which are used to produce the consumption goods (Agiobenebo, 2019). The implication is that investment depends on the rate of change of national output (or income). When national income is increasing, investment will increase in order to increase the capacity to produce consumption goods.

Also, the loanable funds theory stresses interest rate mechanism as the major determinant of savings and investment in a country. According to this theory, interest rate is the price paid to borrow and use loanable funds and, hike in interest rate will crowd-out private investment. The flexible accelerator theory is one of the most popular among the theories of investment. Empirical test of this model in developing countries is rather difficult because of institutional and data constraints. The restrictive assumption of this model such as perfect capital markets and little or no public investment is hardly satisfied in developing countries, Nigeria inclusive.

Beyond the traditional theories of investment elucidated above, the new directions and trends in investment theory as pertains to Less Developed countries (LDC), Nigeria inclusive, as shown in the works of Dailmi and Walton (1989), Borensztein (1990), Green and Vilanuena (1991), Pindyck (1991), Serven and Solimano (1992), Iyoha (1997, 1998), and Soludo (1998) has extended investment model by incorporating considerations for macroeconomic policy (monetary, fiscal and exchange rate), irreversibility, uncertainty, domestic policy-induced risks and external risks (external debt and terms of trade), macroeconomic instability, investment incentive structure and response to it, and credibility of policy reforms.

2.3 Review of Empirical Literature

Christian, et.al (2021) employed autoregressive distributed lag (ARDL) technique to examine the determinants of investment in Nigeria for the period (1981- 2018). The study modeled gross domestic investment as a function of gross domestic product per capita, real interest rate, inflation rate, depth of financial development and real exchange rate. The Bounds test result indicated the presence of long run relationship between gross domestic investment and the variable employed in the study. The findingsof the study show a positive and significant relationship between investment and GDP per capita but a negative and significant relationship exist between investment and real interest rate, inflation rate and real exchange rate. The study concluded that income, interest rate, inflation rate and exchange rate are viable factors which affect gross domestic investment in Nigeria.

Agbarakwe (2019) adopted autoregressive distributed lag (ARDL) model to investigate the determinants of private investment in Nigeria for the period (1980 - 2018). The findings of the study indicate that government expenditure is positively related to private investment whereas interest rate, exchange rate and inflation rate are negatively related to private investment in Nigeria. The study concluded that inflation rate, exchange rate, government expenditure and

interest are significant determinants of private investment in Nigeria.

Ekpo (2015) employed the qualitative method of analysis to examine the determinants of private investment in Nigeria. The study identified determinants of private investment in Nigeria to include domestic inflation rate, size and growth rate of market, availability and access to bank credit, interest rate, fiscal deficits, public investment rate, poor provision of infrastructure, political and economic stability, investment climate and institutional factors. The study recommended that for private investment in Nigeria to be enhanced, there should be proper mobilization of investible fund in the economy by the banking sector through high saving deposits rates and accessibility of such fund by private investors through low lending rate, avoidance of excessive deficit financing and drastic reduction of government borrowing from the banking sector, provision of adequate and efficient internal security, political stability, sustained democratic government and good governance.

Duruechi and Ojiegbe (2015) examined the determinants of investments in the Nigerian economy for the period (1990 - 2013) using Ordinary Least Square (OLS) method and Error Correction model (ECM). The study established the existence of a long-run relationship between investments, inflation rate, government expenditure, exchange rate and interest rate. The finding showsthat government expenditure had positive and significance effect on investment in Nigeria whereas interest rate, inflation rate and exchange rate had negative impact on investment.
Agu (2015) employed Error Correction model to analyze the determinants of private investment in Nigeria for the period (1970 - 2012). The structure for analysis involved the estimation of an investment function derived from the life cycle hypothesis while taking into consideration the structural distinctiveness of a developing economy. The findings of the study show that investment rate had positive correlation with the growth rate of disposable income and the real interest rate on bank deposits. The study stressed that investment in Nigeria has been slowed down as a result of increase in lending rate, reduced public expenditure, low savings, political instability and inadequate infrastructure. Kanu and Nwaimo (2015) used Ordinary Least Square (OLS) method of analysis to examine the relationship between capital expenditures and gross capital formation in Nigeria for the period (1981- 2011) and found that capital expenditures had a negative and significant relationship with gross capital formation in Nigeria.

3. Methodology

3.1 Model Specification

Following the shortcomings of application of the strict version of the neoclassical investment model (Jorgenson, 1971; Hall, 1977) and other theories of investment demonstrated in investment theories literature in isolation (Leff and Sato, 1980; Wai and Wong, 1982), a modified and extended version of investment model which captures the impact of macroeconomic policies variables was adopted in this study. The model estimated is presented in mathematical form as follows:
DINV= f(Y, INF, INT, GCE, EXD, MS, EXR) --- (1)
In econometric form, the model is stated as follows:
$DINV = \alpha_0 + \alpha_1 Y + \alpha_2 INF + \alpha_3 INT + \alpha_4 GCE + \alpha_5 MS + \alpha_6 EXR + \alpha 7 EXD + \mu_t$ --- (2)
In order to bring the variables to the same unit, the variables were transformed to their logarithm for estimation as follows:

$\ln DINV = \alpha_0+\alpha_1 \ln Y+\alpha_2 INF+\alpha_3 INT+\alpha_4 \ln GCE+\alpha_5 \ln MS+\alpha_6 \ln EXR+\alpha_7 \ln EXD+\mu_t$ --- (3)

Where, DINV = Domestic Investment proxied by Gross Capital Formation, Y = National Income proxied by real Gross Domestic Product (RGDP), INF = Inflation rate, INT = Interest rate (lending rate), GCE =Government Capital Expenditure, MS = Market Size proxied by population size, EXR = Exchange Rate and EXD = External Debt. α_0 is autonomous estimate of the function, α_1 - α_7 are measures of marginal effects of the explanatory variables to be estimated and $\mu_t$is the stochastic error terms for the model which captures unexplained influences on the dependent variable. A'priori expectation is as follows: α_1, α_4 and$\alpha_5 > 0$ whileα_2, α_3, α_6 and$\alpha_7 < 0$.

3.2 Estimation Technique

This study employed econometric tools of unit root test, cointegration test, Error Correction Method (ECM) andthe Ordinary Least Squares (OLS) estimation approach. The unit root test examined the stationarity property of the times series data, cointegration test ascertained the existence of long-run relationship of the variables and causality test using granger causality test assessed the causal relationship of the variables. The Ordinary Least Square (OLS) was adopted to investigate the nature long-term relationship between domestic investment (DINV) and macroeconomic policies variables while error correction model (ECM) was used to examine the short-run impact of macroeconomic policies variables on domestic investment as well as ascertained the speed of adjustment from the short-run equilibrium to the long-run equilibrium state. Error correction model (ECM) has its root in Ordinary Least Squares (OLS).The descriptive analysis was incorporated to determine the nature of the data set. To ascertain that the model satisfies some basic econometric assumptions, some diagnostic tests such as auto-correlation (serial correlation) test using Durbin-Watson statistics, normality test using Jarque-Bera test and stability test using the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squared recursive residuals (CUSUMSQ) tests were conducted. Secondary data, spanning the period of 41 years (1981-2021) extracted from theCentral Bank of Nigeria Statistical Bulletin, Annual Report and Statement of Account, Economic and Financial Review of various years as well as World Bank Development Indicator (WDI), was used in the study.

Unit Root Test: A unit root test examines whether a time series variable is non-stationary and possesses unit root. Non-stationary data are unpredictable and using them in regression estimation may produce spurious results. Hence, the need for unit root test to ascertain the stationarity of the data before estimation. Augmented Dickey – Fuller (ADF) test (Gujarati, 1995) was employed in analyzing the integration level of the variables. The ADF equation is stated as:

$$\Delta Y_1 = \alpha_1 + \alpha_2 + \beta Y_{t-1} + \theta_i \Sigma^m_{i=1} \Delta Y X_{t-1} + \mu_t$$

Where Y is variables of interest, Δ is the difference operator, t is the time trend, andμ is the white noise residual of zero mean and constant mean and constant variance. ($\alpha_1, \alpha_2, \beta_1, - - - \beta_m$) is the set of parameters to be estimated. The null hypothesis (H_0) is that the variable under investigation has a unit root, against the alternative (H_1) that it does not. The decision rule is to reject H_0, if the absolute ADF t-statistic is greater than the reported ADF critical values at 5% level of significance. If otherwise, accept H_0.

Co integration Test: After the integration property of the variables has been verified, the next step is to conduct cointegration test, a statistical method used to test the correlation between two or more non-stationary time series in the long-run or for a specified time period. It helps in identifying long-run equilibrium of two or more sets of variables. This paper employed Johansen

co-integration technique and the equation is given as:

$Y_t = Z + \Sigma_{t=1}^{p} U_i Y_{t-1} + \varepsilon_t$

Where, z is a (n 1) vector of deterministic variables, ε is a (n 1) vector of white noise error terms and U_i is a (n n) matrix of coefficients. The ECM has co-integration relations built into the specification so that it restricts the long-run behaviour of the endogenous variables to converge to their co-integrating relationships while allowing for short-run adjustment dynamics.

Causality Test: The granger causality test was adopted to examine the causal relationship between the variables (that is whether one variable is useful in forcasting another). It follows that if the p-value of the variable is greater than 5%, Y significantly contribute to forecast the value of another variable, X, then Y has a causality relationship with X and vice versa. The test employed the equation below:

$$Y_i = \omega_0 + \Sigma^{p}_{z=1}\omega_z Y_{t-z} + \Sigma^{q}_{t=1}\tau_i X_{t-1} + \mu_t$$

$$X_i = \psi_0 + \Sigma^{p}_{z=1}\varphi_z X_{t-z} + \Sigma^{q}_{t=1}\alpha_i Y_{t-1} + \varepsilon_t$$

Where Y_i and X_i are the tested variables, μ_t and ε_t are error terms, and t implies the time period, z and i are the number of lags. The null hypothesis is H_0: $\tau_i = \alpha_i = 0$ for all i. The alternative hypothesis is H_1: $\tau_i \neq \alpha_i \neq 0$, for at least some i. If the coefficient τ_i is significant but α_i is not significant, then X is granger causal to Y. However, if both coefficients are significant, the causality runs both ways.

Error Correction Mechanism (ECM): Error correction mechanism, first used by Sargam, (1983) and latter popularized by Engle and Ganger (1987), was employed in the study to correct short-run disequilibrium. The granger representation theorem states that if two variables are co-integrated, then the relationship between the two can be expressed as ECM.

4. Presentation of Results and Discussion of Findings

4.1 Descriptive Statistics

The descriptive statistics of the variables employed in the study are presented in Table 4.1. The mean, standard deviation, minimum and maximum values of gross fixed capital formation (DINV) are 6943.062, 9787.239, 87.145 and 44187.03 respectively; while those of national income (Y) are 34569.74, 45626.29, 147.572 and 152324.1 respectively. Similarly, the mean, standard deviation, minimum and maximum values of interest rate (INT) are 17.703, 4.383, 9.250 and 29.800 respectively while the mean, standard deviation, minimum and maximum values of government capital expenditure (GCE) are 515.225, 553.044, 4.100 and 2288.996 respectively. The mean, standard deviation, minimum and maximum of exchange rate (EXR) are 106.587, 108.258, 0.673 and 381.000 respectively. The mean, standard deviation, minimum and maximum values of inflation rate (INF) are 19.207, 17.554, 0.224 and 76.759 respectively while the mean, standard deviation, minimum and maximum values of market size (MS) are 1.33, 35753733, 95212454 and 2.06.

Finally, the mean, standard deviation, minimum and maximum values of external debt (EXD) are 2070.630, 2765.063, 298.614 and 12705.62 respectively. The associated probability values of

Jarque-Bera statistics have probabilities less than 5% significant level, so the null hypothesis is rejected which means the error terms in the model (except INT and MS) are normally distributed.

Table 4.1: Descriptive Statistics

	DINV	Y	INT	GCE	EXR	INF	MS	EXD
Mean	6943.062	34569.74	17.70259	515.2252	106.5865	19.20671	1.33E+08	2070.630
Median	2473.473	8150.016	17.55502	321.3781	111.2300	12.00000	1.25E+08	648.8130
Maximum	44187.03	152324.1	29.80000	2288.996	381.0000	76.75887	2.06E+08	12705.62
Minimum	87.14485	147.5717	9.250000	4.100100	0.672867	0.223606	95212454	298.6144
Std. Dev.	9787.239	45626.29	4.382461	553.0435	108.2578	17.55356	35753733	2765.063
Skewness	2.239648	1.230989	0.400122	1.249173	1.055230	1.923901	0.541628	2.175172
Kurtosis	8.155279	3.260405	3.763149	4.254268	3.434067	5.640719	1.991966	7.688984
Jarque-Bera	75.79162	9.959869	1.987030	12.69924	7.543991	35.39084	3.558062	66.48212
Probability	0.000000	0.006875	0.370273	0.001747	0.023006	0.000000	0.168802	0.000000
Sum	270779.4	1348220.	690.4008	20093.78	4156.873	749.0618	5.20E+09	80754.58
Sum Sq. Dev.	3.64E+09	7.91E+10	729.8268	11622572	445350.4	11708.85	4.86E+16	2.91E+08
Observations	39	39	39	39	39	39	39	39

Source: Author's Computation

4.2 Unit Root Test Result

Table 4. 2: Augmented Dickey-FullerUnit Root Test Result

Variables	ADF Statistics	Macknnon Critical Values at 5%	Order Of Integration
DINV	-4.654179	-2.971853	I(1)
Y	8.424803	-2.963972	I(1)
INT	-4.123791	2.963972	I(1)
GCE	-5.626602	-2.976263	I(1)
EXR	-3.567591	-2.967767	I(1)
INF	-4.053014	-2.967767	I(1)
MS	-4.042838	-3.595026	I(1)
EXD	-5.272611	-2.976263	I(1)

Source: Author's computation

The augmented Dickey-Fuller unit root test result is presented in Table 4.2. The result indicates that all the variables were stationary at first difference, 1(1). It is this order of integration that forms the basis for employing the OLS econometric method of estimation in this study.

4.3 Cointegration Test Result

Having established that the variables were stationary, the cointegration test was conducted using Johansen cointegration method and the result is presented in Table 4.3. The trace value test indicates four (4) cointegrating equations at 5% level of significance while maximum eigen value test shows two (2) cointegrating equations at 5% level of significance. This indicates that the variables employed in this study were cointegrated and consequently, gross capital formation (proxy for domestic investment (DINV)) had a long-run relationship with other variables.

Table 4.3: Johansen Cointegration Test Result

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05	Prob.**
None *	0.922453	271.1839	159.5297	0.0000
At most 1 *	0.834202	176.5798	125.6154	0.0000
At most 2 *	0.661191	110.0913	95.75366	0.0036
At most 3 *	0.513612	70.04548	69.81889	0.0480
At most 4	0.435295	43.37779	47.85613	0.1236
At most 5	0.289584	22.23409	29.79707	0.2857
At most 6	0.225269	9.583650	15.49471	0.3141
At most 7	0.003771	0.139773	3.841466	0.7085

Trace test indicates 4 cointegrating equations at the 0.05 level
** denotes rejection of the hypothesis at the 0.05 level*
***MacKinnon-Haug-Michelis (1999) p-values*

Unrestricted Cointegration Rank Test (Maximum Eigen value)

Hypothized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.922453	94.60411	52.36261	0.0000
At most 1*	0.834202	66.48844	46.23142	0.0001
At most 2	0.661191	40.04584	40.07757	0.0504
At most 3	0.513612	26.66769	33.87687	0.2816
At most 4	0.435295	21.14369	27.58434	0.2676
At most 5	0.289584	12.65044	21.13162	0.4849
At most 6	0.225269	9.443877	14.26460	0.2511
At most 7	0.003771	0.139773	3.841466	0.7085

Max-eigen value test indicates 2 cointegrating equations at the 0.05 level,
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Source*: Author's Computation*

4.4 Ordinary Least Squares (OLS) Estimation Results

The regression estimates results are presented in Table 4.4. The result indicates that national income (Y) and government capital expenditure (GCE) had positive relationship with domestic investment (DINV) in line with the a priori expectations and were statistically significant at 5% level of significance. The positive effect of national income is consistent with the accelerator theory of investment which posits a positive relationship between investment and income. It is

also in line with the findings of Nkwagu et.al (2021), whose study revealed that national income has significant and positive relationship with investment in Nigeria.

The coefficient of national income (Y) which is 0.473, implies that holding other variables constant, a unit increase in national income will increase domestic investment (DINV) in Nigeria approximately by 0.47 per cent. The positive and significant impact of government capital expenditure on investment implies that government investment in infrastructure complements private investment in Nigeria, as it provides enabling environment for businesses to thrive, hence attracts investment from both foreign and local investors. It is consistent with the finding of Agbarakwe (2019).The coefficient of government capital expenditure (GCE) is 0.282, implying that holding other variables constant, 1 percent increase in government capital expenditure (GCE) will cause domestic investment (DINV) to increase by 0.28 per cent.

Table 4.4: Ordinary Least Squares (OLS) Estimation Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-16.03974	12.05261	-1.330810	0.1930
LY	0.472875	0.139900	3.380094	0.0020
INT	0.000743	0.009385	0.079183	0.9374
LGCE	0.281951	0.076749	3.673680	0.0009
LEXCR	-0.052358	0.086384	-0.606107	0.5489
INF	-0.000804	0.001840	-0.436762	0.6653
LMS	0.939822	0.694267	1.353689	0.1856
LED	0.099737	0.043462	2.294798	0.0287

R-squared	0.994792	Mean dependent var	7.620446
Adjusted R-squared	0.993616	S.D. dependent var	1.900878
S.E. of regression	0.151883	Akaike info criterion	-0.750728
Sum squared resid	0.715123	Schwarz criterion	-0.409485
Log likelihood	22.63921	Hannan-Quinn criter.	-0.628293
F-statistic	845.8763	Durbin-Watson stat	1.081652
Prob(F-statistic)	0.000000		

Source: Authors Computation

A positive but statistical insignificant relationship at 5% level of significance was observed between market size (MS) and domestic investment (DINV) in Nigeria. The positive relationship is in conformity with the a priori expectations. The insignificant impact of market size on domestic investment could be trace to the fact that though Nigeria has a large population, the per capita income of the country is low. The coefficient, 0.940, shows that holding other variables constant, a unit increase in market size will cause 0.94 per cent increase in domestic investment (DINV). Also, a positive but statistical insignificant relationship at 5% level of significance existed between interest rate (INT) and domestic investment (DINV) contrary to a priori expectations. Its coefficient, 0.0007 indicates that holding other variables constant, 1 per cent increase in interest rate will result in 0.0007 per cent increase in domestic investment (DINV). The implication is that interest rate does not affect investment in Nigeria. This could be due to the fact that most commercial banks in Nigeria are not in the habit of giving out loans for long term investment.

The exchange rate (EXR) had negative but statistical insignificant relationship with domestic investment (DINV) in line with the a priori expectations The coefficient of exchange rate (EXR)

which is – 0.052, indicates that 1 per cent increase in exchange rate (EXR) will reduce domestic investment (DINV) by 0.05 per cent. The negative effect of exchange rate on domestic investment in Nigeria is expected in view of the fact that exchange rate depreciation in Nigeria makes importation of machineries, equipment and raw materials costly, thereby making domestic manufactured goods becoming less competitive and investment unprofitable. In accordance with a priori expectations, inflation rate had negative but insignificant impact on domestic investment. The coefficient of inflation rate (INF) is - 0.000840, showing that increase in inflation rate (INF) by 1 per cent will reduce domestic investment (DINV) by 0.0008 per cent. However, their results were statistically insignificant at 5% level of significance. The external debt (EXD) had positive relationship with domestic investment (DINV) contrary to the a priori expectations. Its result is statistically significant at 5% level of significance and its coefficient, 0.099 indicates that 1per cent increase in exchange rate will result in 0.099 per cent increase in domestic investment. The positive relationship of external debt (EXD) with domestic investment (DINV) is not unconnected with the fact that Nigeria, being an import dependent economy, external borrowing makes foreign exchange available for importation of machineries, equipment and raw materials used by business firms in the country. The model showed that adjusted R^2 is 0.99, indicating that 99% of the variations in domestic investment (DINV) were explained by the model. The F-statistic indicated that the variables were jointly significant at 5% level, and the Durbin Watson (DW) statistic of 1.08 showed the absence of autocorrelation in the model.

4.5 Error Correction Model (ECM)

The error correction model (ECM) result is presented in Table 4.5. The sign of the short run dynamic interactions is consistent with that of the long run relationship. The estimated error correction coefficient of - 0.709385 with probability value of 0.0002, is highly significant, has the correct sign and implies a fairly high speed of adjustment to equilibrium after a shock. About 71% of disequilibria from the previous year's shock converge back to the long run equilibrium in the current year. The R^2 is 0.6746, indicating that about 67 per cent of the variation in DINV were explained by the model. The F- statistic of 7.256641and probability value of 0.00034 showed that the variables were jointly significant at 5% level, and Durbin Watson (DW) statistic of 1.194971 indicated the absence of autocorrelation in the model.

Table 4.5: Error Correction Model (ECM) Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.042357	0.049511	-0.855499	0.3995
D(LY(-1))	0.616713	0.153953	4.005861	0.0004
D(INT(-1))	0.002558	0.004410	0.579959	0.5666
D(LGCE(-1))	0.174407	0.055232	3.157711	0.0038
D(LEXR(-1))	0.016292	0.078248	0.208204	0.8366
D(INF(-1))	-0.000310	0.001150	-0.269448	0.7896
D(LMS(-1))	2.511391	1.790948	1.402269	0.1718
D(LEXD(-1))	-0.075908	0.047528	-1.597122	0.1215
ECM(-1)	-0.709385	0.168329	-4.214277	0.0002

R-squared	0.674620	Mean dependent var	0.152289
Adjusted R-squared	0.581654	S.D. dependent var	0.153502
S.E. of regression	0.099285	Akaike info criterion	-1.573873
Sum squared resid	0.276010	Schwarz criterion	-1.182028
Log likelihood	38.11666	Hannan-Quinn criter.	-1.435730

F-statistic	7.256641	Durbin-Watson stat	1.194971
Prob(F-statistic)	0.000034		

Source*: Author's Computation*

4.6 Granger Causality Test Result

The causality test was conducted to ascertain whether a causal relationship exists between domestic investment and dependent variables as well as the direction of causality. The rule states that if the probability value lies between 0 and 0.05, there is a causal relationship. The granger causality test result is presented in Table 4.6. The results showed that there is a unidirectional relationship between national income (Y) and domestic investment (DINV), a unidirectional relationship between exchange rate (EXR) and domestic investment (DINV) and a unidirectional relationship between inflation rate (INF) and domestic investment (DINV). The result also showed bi-directional relationship between market size (MS) and domestic investment (DINV) and a unidirectional relationship between external debt (EXD) and domestic investment (DINV).

Table 4.6: Pairwise Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
LY does not Granger Cause LDINV	38	3.32450	0.0484
LDINV does not Granger Cause LY		0.06799	0.9344
INT does not Granger Cause LDINV	38	2.03932	0.1462
LDINV does not Granger Cause INT		0.83623	0.4423
LGCE does not Granger Cause LDINV	38	3.10284	0.0582
LDINV does not Granger Cause LGCE		1.45031	0.2491
LEXR does not Granger Cause LDINV	37	3.92049	0.0300
LDINV does not Granger Cause LEXCR		0.42046	0.6603
INF does not Granger Cause LDINV	38	1.25964	0.2970
LDINV does not Granger Cause INF		4.14512	0.0248
LMS does not Granger Cause LDINV	38	3.94643	0.0291
LDINV does not Granger Cause LMS		3.40841	0.0451
*LEXD does not Granger Cause LDINV	38	3.23456	0.0521
LDINV does not Granger Cause LED		1.85439	0.1725
INT does not Granger Cause LY	38	2.75241	0.0784
LY does not Granger Cause INT		0.83272	0.4438
LGCE does not Granger Cause LY	38	0.96497	0.3915
LY does not Granger Cause LGCE		5.54633	0.0084
LEXR does not Granger Cause LY	37	8.39039	0.0012
LY does not Granger Cause LEXR		1.48519	0.2417
INF does not Granger Cause LY	38	0.37090	0.6930
LY does not Granger Cause INF		2.79437	0.0757

LMS does not Granger Cause LY	38	4.55314	0.0179
LY does not Granger Cause LMS		3.37622	0.0463
LEXD does not Granger Cause LY	38	0.67032	0.5184
LY does not Granger Cause LEXD		2.71698	0.0809
LGCE does not Granger Cause INT	38	0.88540	0.4221
INT does not Granger Cause LGCE		2.25732	0.1206
LEXR does not Granger Cause INT	37	0.47150	0.6283
INT does not Granger Cause LEXR		0.54189	0.5869
INF does not Granger Cause INT	38	1.49348	0.2394
INT does not Granger Cause INF		1.91804	0.1629
LMS does not Granger Cause INT	38	0.91194	0.4116
INT does not Granger Cause LMS		12.2095	0.0001
LEXD does not Granger Cause INT	38	0.69834	0.5046
INT does not Granger Cause LEXD		0.06554	0.9367
LEXR does not Granger Cause LGCE	37	7.40916	0.0023
LGCE does not Granger Cause LEXR		1.02283	0.3710
INF does not Granger Cause LGCE	38	0.63344	0.5371
LGCE does not Granger Cause INF		3.94916	0.0290
LMS does not Granger Cause LGCE	38	1.75563	0.1886
LGCE does not Granger Cause LMS		3.28037	0.0502
LEXD does not Granger Cause LGCE	38	1.03152	0.3677
LGCE does not Granger Cause LEXD		2.68731	0.0829
INF does not Granger Cause LEXR	37	2.54824	0.0940
LEXR does not Granger Cause INF		4.99405	0.0130
LMS does not Granger Cause LEXR	37	0.74174	0.4843
LEXR does not Granger Cause LMS		4.35983	0.0212
LEXD does not Granger Cause LEXR	37	0.19261	0.8257
LEXR does not Granger Cause LEXD		1.29069	0.2890
LMS does not Granger Cause INF	38	8.36969	0.0011
INF does not Granger Cause LMS		4.84595	0.0143
LEXD does not Granger Cause INF	38	1.61422	0.2144
INF does not Granger Cause LEXD		0.11376	0.8928
LEXD does not Granger Cause LMS	38	0.00384	0.9962
LMS does not Granger Cause LEXD		2.20815	0.1259

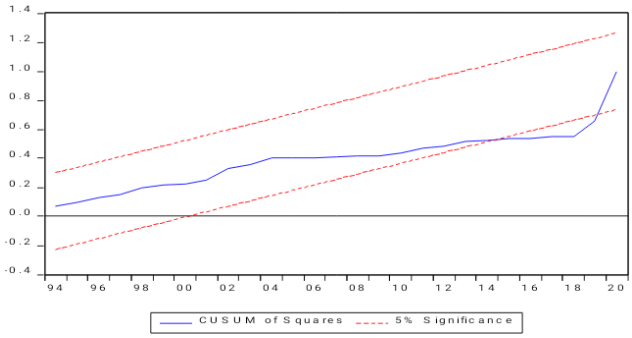
Source*: Authors Computation*

4.6 Diagnostic Test Result

The stability of the coefficients of OLS model in Table 4.4 was assessed by conducting the

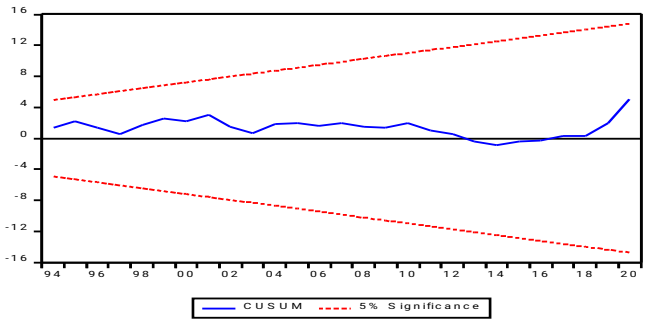
cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squared recursive residuals (CUSUMSQ) tests proposed by Brown et al (1975). The residuals were updated recursively and plotted against the break points for the 5% significance line. Figures 1 and 2 plot the results for CUSUM and CUSUMSQ tests respectively. For the parameter to be adjudged stable, it is expected that the plot of the CUSUM and CUSUMSQ statistic fall inside the critical bounds of the 5% confidence interval (that is the blue line should fall in between the two dotted red V-masked lines and in between the two upward moving parallel lines). The results as shown in Figures 1 and 2 indicate that the plot of the CUSUM and CUSUMSQ statistic fall inside the critical bounds of the 5% confidence interval of parameter, indicating that all coefficients of the OLS model were stable over the sample period.

Figure1: Plot of the CUSUM for the OLS model



Source: Plotted by the author using Eviews 10 software

Figure 2: Plot of the CUSUMSQ for the OLS model



Source: *Plotted by the author using Eviews 10 software*

The Durbin Watson (DW) result for Ordinary Least Squares regression result shown in Table 4.4 was used to ascertain the existence of autocorrelation. The Dublin Watson test statistic is 1.082, indicating the absence of serial correlation in the model.

5. Conclusion and Recommendations

This paper empirically examined the impact of macroeconomic policies variables on domestic investment in Nigeria for the period (1981-2021) using a modified and extended version of investment model which captures the impact of macroeconomic policies variables and Ordinary Least Square (OLS) estimation technique for analysis. The result indicates that national income (Y), government capital expenditure (GCE) and external debt (EXD) had positive and significant impact on domestic investment (DINV). Also, market size (MS) proxied by population size and interest rate (INT) had positive but statistical insignificant effect on domestic investment (DINV). Both exchange rate (EXR) and inflation rate (INF) had negative but insignificant relationship with domestic investment (DINV). The model showed that adjusted R^2 is 0.99 indicating that about 99 per cent of the variations in DINV were explained by the model. The F-statistics is significant. This study concludes that macroeconomic policy affects domestic investment in Nigeria, and the drivers of domestic investment in Nigeria in relation to macroeconomic policies identified in the study are income, government expenditure especially capital expenditure, interest rate and external debts while exchange rate and inflation rate exerted negative effect.

However, market size proxied by population size also exerted positive effect on domestic investment. The empirical findings of this paper have some serious policy implications relevant to the growth of investment level in Nigeria. Hence, it is recommended that government policy should be directed toward increasing the productive base of the economy in order to reduce unemployment, boost output and income in the economy and, consequently increase national income. Government should ensure that capital expenditure forms the bulk of total government expenditure for some years and should be prudently employed in provision of economic and social overhead capital (infrastructure) which is known for complementing private investment in Nigeria. To minimize uncertainty, fiscal policy in the country should be complemented with effective monetary policy in order to handle inflation rate volatility and interest rate issues. Also exchange rate management should be intentionally geared toward ensuring relative stability of

exchange rate.

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