

EFFECTS OF INFLATION RATE AND MONEY SUPPLY ON FOREIGN DIRECT INVESTMENTS IN NIGERIA

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ABSTRACT

This study examined the effect of inflation rate and money supply on foreign direct investment in Nigeria over the period of 1985 to 2022. It utilized time series research design and secondary data were obtained from Central Bank of Nigeria Statistical Bulletin. It employed the Auto-Regressive Distributed Lag (ARDL) model to examine both the short run and long effect of the selected variables on foreign direct investment. The bound co-integration test result showed evidence of long run relationship among inflation rate and money supply on foreign direct investment in Nigeria. In the long run, the result of the ARDL model showed that Inflation rate and money supply have no significant effect on foreign direct investment in Nigeria. In the short run, it was revealed that inflation rate was found to have a negative and statistically significant effect on foreign direct investment, while money supply has a positive and significant effect on foreign direct investment. The study recommends that efforts should be made by monetary authorities to reduce the inflation rate if the policy objective of increasing FDI is to be achieved.

Keywords: Auto-Regressive Distributed Lag Model, Foreign Direct Investment, Inflation Rate, Money Supply.

INTRODUCTION

It is the desire of every nation in the world to increase its capital stock as this plays a vital role in increasing the production of goods and services in the long run. Foreign direct investment is concerned with the inflow of foreign capital into productive enterprises or businesses by individuals, firms, or governments of other countries, either by buying a company or by expanding the operations of an existing business in the target country. Foreign direct investment pertains to international investment in which the investor obtains a lasting interest in an enterprise in another country. It may be in the form of buying, building, or constructing a factory or business in a foreign country or adding improvements to such facility in the form of property, plants, or equipment (Asiamah et al., 2019).

The Nigerian government has taken steps to woo foreign investors into the economy since the enthronement of democracy in 1999. These measures include the repeal of laws that are inimical to foreign investment growth, promulgation of investment laws and various oversea trips to shore up the country's image (Omondiale, 2018). Foreign investment affects the economic growth of host countries mainly through channels which include technological spill-over and inflow of human capital. Technological spill-over to the host country's economy is usually through

imitation and forward and backward linkages with domestic enterprises and suppliers. Technological spill-over enables domestic firms to improve their efficiency and productivity. Foreign direct investment also narrows knowledge gap between a developed country and its host economy. Empirical evidence shows that foreign investment positively benefits developing countries, not only by supplementing domestic investments, but also, in terms of job creation, transfer of technology, increased domestic competition and other positive externalities (Giwa et al., 2020).

One of the most controversial issues in economic literature is the exact linkage between inflation rate, money supply and foreign investments. Though inflationary pressure is not new in the Nigerian economic history, the recent rates of inflation have been a cause of great concern to many. The rising upsurge in the inflationary rate has consequences for the economy of Nigeria. Data from the Central Bank of Nigeria (2022) show that inflation is around 20 per cent and this high level of inflation is a major issue confronting monetary authorities. High inflation will decrease the real value of money used for effective demand of consumption and production of goods and services for households and firms. Inflation effectively reduces the basket of goods and services that the private sector can demand as well as increases the operating cost of firms. Inflation causes serious economic discomfort to households, businesses, government, and foreign investments all over the world (Adeniyi, 2020). Inflation rate has social and economic dimensions as it is a shock, eroding real purchasing power, savings and investments (Moodley, 2020). However, Ishmael (2004) argued that inflation could be used for other positive purposes as the study presumes that the government can inflate the economy in return for some perceived real benefits, expositing that even though money may be neutral in the long run, it is powerful in the short run.

Money supply is important as it influences the real value of money and affects the real price level, as well as foreign investments into an economy (Ifionu & Akinpelumi, 2015). The broad money supply includes a broad range of financial assets that could be liquefied within a short period of time in order to make business transactions. It includes currency notes outside the banking system, demand and time deposits in the vaults of commercial banks plus other financial assets held by financial firms in the economy. The government uses contractions and expansions in money supply usually with fiscal policy to alter the availability of credit through commercial banks. Ita et al. (2020) maintain that the supply of credit by commercial banks to households, firms and governments enable them to advance production goals in a planned or expected direction.

The oil boom which is said to have become a resource curse to Nigeria led to a high rate of dependence on imports for virtually all consumer goods led to Nigeria having balance of payments deficits. This resulted to taking loans to finance such deficits. The oil glut from 1981, that resulted into balance of payment deficits also led to foreign exchange crises that necessitated various measures of import restrictions. These restrictions reduced raw materials for domestic production and spare parts for machinery operation (Anidiobu et al., 2018). The resultant shortage of goods and services for local consumption spurred a rapid and continuous rise in the cost of goods and services in the economy which has largely continued till date. As a result of the devastating effects of inflation on the Nigerian economy, many attempts have been made to formulate policies aimed at restructuring the economy for diversification and self-reliance.

One of the attempts put to curb inflation and strengthen the Nigerian economy is the structural adjustment programme (SAP) in 1986. Nigeria's naira became devalued in contrast to currencies

of other nations like the pound sterling and dollars. The devaluation of the naira led to a very high inflation rate as prices of imported intermediate outputs required for domestic production rose sharply. However, domestic production for export refused to be stimulated as inputs and machines had to be imported at high cost, pushing inflation into double digit.

Adelekan et al. (2020) state that many countries have a monetary policy that focuses basically on controlling inflation which is often associated with contractionary money supply. While contractionary money supply policies reduce the currency held by financial institutions and in pockets of private individuals resulting in restriction of credit to private sector, expansion of money supply increases money in the vaults of financial institutions and increases available credit to private sector.

The broad objective of this study is to examine the effect of inflation rate and money supply on foreign direct investments in Nigeria. The specific objectives are to:

- i. investigate effect of inflation rate on the foreign direct investments in Nigeria
- ii. ascertain effect of money supply on the foreign direct investments in Nigeria

The hypotheses of the study are stated in null form as follows:

H₀₁: Inflation rate has no significant effect on the foreign direct investments in Nigeria.

H₀₂: Money supply has no significant effect on the foreign direct investments in Nigeria.

LITERATURE REVIEW

Conceptual Review

Inflation Rate

Inflation is one of the most frequently used terms in economic discussions, yet the concept is variously misconstrued. Although, there are various schools of thought on inflation, there seems to be a consensus among economists that inflation is a continuous and appreciable rise in the general price level. Simply put, inflation depicts an economic situation where there is a sustained rise in the prices of goods and services. Bryne and Zekaite (2021) described inflation as continued increase in the general price level. Inflation rate is measured as the percentage change in the consumer price index. The consumer price index measures the price of a representative basket of goods and services purchased by the average consumer and calculated based on periodic survey of consumer prices.

Money Supply

Money supply is the life wire of all economic activities and so has powerful effects on the economic life of any nation. Ahuja and Jaswal (2020) described money supply as the total stock of monetary medium of exchange available to a society for use in connection with its economic activities. Growth of money supply is an important factor not only for acceleration of the process of economic development but also for the achievement of price stability in the economy. The supply of money at any moment is the total amount of money in the economy. It also comprises currency with the public and demand and time deposits with commercial banks.

Foreign Direct Investments

Adegbite and Ayadi (2010) posit that foreign investment consists of FDI and foreign portfolio investment. FDI is a direct investment into production or business in a country by an individual or company of another country, either by buying a company or by expanding the operations of an existing business in the target country. FDI is an investment involving acquiring or creation of assets that is undertaken by foreigners or a joint venture with local governments with the main aim of creating a long-term relationship. Moreover, this may lead to a lasting interest and control by a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the FDI enterprise or affiliate enterprise or foreign affiliate.

Empirical Review

Inflation Rate and Foreign Direct Investments

Ukachukwu and Odionye (2020) examined the impact of selected macroeconomic variables on foreign direct investment in Nigeria over the period of 1981 to 2017. It employed the Auto-Regressive Distributed Lag (ARDL) bound co-integration model to examine both the short run and long impacts of the selected variables on FDI. The bound co-integration test result showed evidence of long run relationship between FDI and selected macroeconomic variables in the country. The result of the ARDL model showed that foreign exchange rate and crude oil prices positively and significantly influenced FDI in the country both in the short run and in the long run. The result further showed inflation to have a negative and significant impact on FDI both in the short and in the long run. It equally showed that, while real gross domestic product has a positive and significant influence on FDI in the short run, its effect in the long the effect is insignificant.

Akpensuen et al. (2020) investigated the impact of inflation on FDI. The data were obtained from CBN statistical database spanning from 1971 to 2019. The stationarity of the time series data was analyzed using graphical method and the ADF test. The result of the analysis revealed that the data became stationary after the first difference. Empirical results further revealed that there was 1 co-integration equation between inflation and FDI. Evidence from the vector error correction model (VECM) established that there is no long run causality running from inflation to FDI in Nigeria. The Wald test revealed that there is no short run causality running from inflation to FDI in Nigeria. In all, findings revealed that inflation has no impact on FDI in Nigeria during the period under review.

Adebayo et al. (2020) explored the linkages between FDI inflows and some selected macroeconomic indicators (exports, gross capital formation, trade openness, inflation, and economic growth) utilizing yearly data spanning between 1981 and 2018. The study used ARDL technique to capture the linkages between FDI inflows and its determining indicators. Furthermore, the wavelet coherence technique was used. Additionally, the FMOLS and the DOLS are employed as a robustness check to the ARDL long-run estimation. The findings from the ARDL long-run estimate reveal that exports and trade openness exert a positive impact on FDI inflows. The findings from the FMOLS and DOLS supported the ARDL results.

Kwoba and Kibati (2016) studied the effects of selected macroeconomic variables on foreign direct investments in Kenya. Foreign direct investment is the dependent variable while the independent variables are exchange rate, GDP, and Inflation rate. Data were collected and

analysed for a ten-year period. Regression analysis was used to determine the relationship between exchange rate, GDP, inflation rate and FDI inflows. Exchange rate, GDP and Inflation rate were found to have a negative but insignificant effect on FDI inflows.

Alshamsi et al. (2015) examined the impact of inflation rate and GDP per capita on inward FDI inflows into United Arab Emirates (UAE). Data on the variables of inflation rate, GDP per capita, and FDI inflows are obtained from the World Bank and UNCTAD and covered a span of 33-year time series covering the period from 1980 to 2013. For the sake of examining the long-run relationship between the independent and dependent variables the autoregressive distributed lag (ARDL) model is applied. The findings of the study reveal that inflation has no significant effect on FDI inflows whereas GDP per capita, proxy used for market size, has a significantly positive impact on FDI inflows.

Omankhanlen (2011) examined the effect of exchange rate and inflation on FDI and its relationship with economic growth. Its main objective is to find the effect of inflation and exchange rate and the bidirectional influences between FDI and economic growth in Nigeria. A thirty-year period was studied. A linear regression analysis was used to analyze the data. The result obtained from the regression shows that there was a negative and non-significant impact of inflation on foreign direct investment. The study also revealed that FDI follows economic growth occasioned by trade openness which saw the entry of some major companies especially the telecommunication companies, while inflation has no effect on FDI. However, exchange rate has effect on FDI.

Udoh and Egwaikhide (2008) examined the effect of exchange rate volatility and inflation uncertainty on FDI in Nigeria. The investigation covered the period between 1970 and 2005. Exchange rate volatility and inflation uncertainty were estimated using the GARCH model. Estimation results indicated that exchange rate volatility and inflation uncertainty exerted significant negative effect on foreign direct investment during the period. In addition, the results show that infrastructural development, appropriate size of the government sector and international competitiveness are crucial determinants of FDI inflow to the country.

Money Supply and Foreign Direct Investments

Mukhtarov et al. (2020) examined the impact of monetary policy (proxied by money supply and interest rate) and tax revenue on foreign direct investment in Jordan employing time series data period from 1991 to 2017. VECM, Canonical Co-Integrating Regression and the Fully Modified Ordinary Least Squares methods were all applied in empirical estimations. Estimation results reveal that money supply has a positive and statistically significant impact on the FDI, while tax revenue has a negative impact on FDI in Jordan. Also, it is found that the impact of interest rate is statistically insignificant.

Nouman et al. (2015) analysed the relationship between money supply and GDP on FDI in the case of Pakistan. Using the how these variables effective in Pakistan. Using the Generalized Method of Moments (GMM) framework and focusing on the period from 1970 to 2013, they found that effect of Money Supply and GDP on foreign direct investment is positively significant.

Theoretical Framework

Quantity Theory of Money

Quantity theory of money contends that the quantity of money in circulation is the main factor that determines the general price level in any economy. If the quantity of money in circulation changes, it will lead to change in the price level of goods and services. The theory was propounded by Irving Fisher in 1911.

According to Glahe (1977), it must be noted that the monetary conclusion is based on the joint validity of a particular assumption about the demand for and supply of money. They are both assumed to be perfectly interest elastic. This is what is referred to as the exogeneity of money. The Monetarist's contention hence goes thus: given the level of real money supply and the level of demand for money at certain income levels, money do not change alone with changes in the level of interest rate. For the derivation of the general equilibrium, the equilibrium in the real (goods) market is needed which together with the money market equilibrium, yield the general equilibrium level referred to as the aggregate demand in the economy, while the full employment level yields what is referred to as aggregate supply level. Therefore, national income and price are determined by the equilibrium of aggregate demand and supply (Omofa, 2000).

An increase in the equilibrium in the goods market will only lead to an increase in the rate of interest with little or no impact on the income and price levels. It can thus be said that the impact of fiscal policy is not necessary since it may not yield the desired result. If on the other hand, nominal money supply is increased through Central Bank, it will result in an increase in the money market equilibrium. This now meets the original equilibrium in the goods market at full employment which results in a higher aggregate demand than when fiscal policy was embarked upon. As a result of this decision, aggregate demand meets aggregate supply at a higher level of national income and price level (Omofa, 2000).

METHODOLOGY

This study adopts ex-post facto research design. It employed secondary sources of data collection. Data on inflation rate, money supply and foreign direct investments of Nigeria were collected from the Central Bank of Nigeria's statistical bulletin for the various years (1985 to 2022). The study used Autoregressive Distributed Lag (ARDL) model to capture the stated objectives. ARDL specification needs to be augmented with an adequate number of lagged first differenced repressors fore estimation. In addition, the ARDL model suggests that once the order of the ARDL is determined the relationship can be estimated by OLS. Thus, estimation shall begin with the test for the appropriate lag order using Akaike information model selection criteria.

Model Specification

The functional model for the effects of inflation and money supply on foreign direct investment is stated as:

$$FDI = f(INFR, MOS)$$

where:

FDI = Foreign Direct Investments

INFLR = Inflation Rate

MOS = Money Supply

The ARDL model of this study is specified as:

$$\Delta FDI_{t-i} = \alpha_0 + \sum_{g=1}^{k-1} \alpha_{1i} \Delta FDI_{t-i} + \sum_{i=1}^{k-1} \alpha_{2i} \Delta INFLR_{t-i} + \sum_{l=1}^{k-1} \alpha_{3i} \Delta MOS_{t-i} + \alpha_4 FDI_{t-i} + \alpha_5 INFLR_{t-i} + \alpha_6 MOS_{t-i} + \mu_t$$

Where Δ = Difference Operator, Σ = summation, ECT_{t-1} = lagged Error Correction Term and, ε_t = Error Term. Also, α_1 , α_2 , and α_3 examine the short run dynamic relationship while α_4 , α_5 , and α_6 investigate the long-run relationship between dependent variable and independent variables.

The lag length or order of the variables was selected by using Akaike Information Criteria (AIC).

RESULTS

Summary of Descriptive Statistics

Table 1: Descriptive Statistics

	FDI	INFLR	MOS
Mean	2.774054	19.08108	8780425.
Median	1.880000	12.56000	1985192.
Maximum	8.840000	72.84000	44443066
Minimum	0.190000	5.390000	26277.60
Std. Dev.	2.563976	17.44928	1882190.
Observations	38	38	38

Source: E-views 12 Output, 2024

Table 1 above shows that the mean of Foreign Direct Investment (FDI), Inflation Rate (INFLR) and Money Supply (MOS) are 2.774054, 19.08108 and 8780425 respectively. The standard deviation of FDI, INFLR and MOS are 2.563976, 17.44928 and 1882190 correspondingly. The minimum values of FDI, INFLR and MOS are 0.19, 5.39 and 26277.60 respectively. The maximum values of FDI, INFLR and MOS are 8.84, 72.84 and 44443066 in that order.

Correlation Analysis

Table 2: Correlation Analysis

	FDI	INFLR	MOS
FDI	1.0000		
INFLR	-0.2890	1.0000	
MOS	0.3298	-0.2766	1.0000

Source: E-views 12 Output, 2024.

From Table 2, it can be observed that Money Supply has a positive correlation with Foreign Direct Investment (FDI), while Inflation Rate (INFLR) has a negative correlation with FDI.

Unit Root Test

Table 3: Augmented Dickey-Fuller Unit Root Test

Variables	LEVEL			FIRST DIFFERENCE				
	ADF Test Statistic	Critical Value @ 5%	Prob-Value	ADF Test Statistic	Critical Value @ 5%	Prob-Value	Max Lag	Order of Integration
FDI	-2.040328	-2.954021	0.2691	-3.968737	-2.954021	0.0147	6	1(1)
INFLR	-1.816801	-2.963972	0.3655	-4.129184	-2.963972	0.0075	6	1(I)
MOS	-3.191583	-2.945842	0.0288				6	1(0)

Source: E-views 12 Output, 2024.

From the Table above, it could be observed that Money Supply (MOS) is stationary at level, with ADF Test Statistic of -3.191583 which is greater than critical value of -2.945842. However, FDI and INFLR have absolute ADF Test Statistic of -2.040328 and -1.816801, these values at level are less than the critical values of -2.954021, -and -2.963972. Therefore, FDI and INFLR are not stationary at level. FDI and INFLR were found to be stationary at first difference, that is, order 1(I), both at 5% level of significance. Since all the variables were found to be stationary at different orders, of 1(1) and 1(0), it was safe for the study to employ bound test approach to validate or test for the presence of Co-integration. The order of integration of the variables are mixed, therefore, this study run Autoregressive Distributed Lag (ARDL) as the technique of analysis.

Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-974.4471	NA	1.91e+21	63.19014	63.42142	63.26553
1	-845.4412	208.0740	2.38e+18	56.48008	57.86781	56.93244
2	-792.7697	67.96324	4.58e+17	54.69482	57.23899	55.52416
3	-767.9878	23.98253	6.85e+17	54.70889	58.40950	55.91519
4	-729.0492	25.12167	7.00e+17	53.80962	58.66668	55.39290
5	-595.1741	43.1855*	6.29e+15*	46.78543	52.79892	48.74568
6	3493.497	0.000000	NA	-215.386*	-208.2169*	-213.0497*

Table 4: Lag Order Selection

Source: E-view 12 Output, 2024.

Table 4 above shows that Akaike Information Criterion (AIC) has the lowest value of -215.3869 at lag 6. Therefore, lag 6 is selected as the maximum lag for the analysis.

Bound Test Co-Integration Test

Table 5: ARDL Co-integration Wald Test Result (ARDL Long Run Equilibrium Condition)

Test Statistic	Value	Signif.	I(0)	I(1)
F-Statistics	6.597905	10%	2.2	3.09
K	2	5%	2.56	3.49
		1%	3.29	4.37

Source: E-view 12 Output, 2024.

The Table above presents the result of the ARDL bound test approach to Co-integration. The result revealed that there is presence of co-integration among the variables. The F-statistics value of 6.597905 is greater than the lower bound value of 2.56 and upper bound values of 3.49 at 5% level of significance. Hence, there is a sufficient proof of the presence of a long-run equilibrium relationship between inflation rate, money supply and foreign direct investment in Nigeria between 1985 and 2022.

Results of Long-run Relationship

Table 6: Long Run Form (Dependent Variable: FDI)

VARIABLES	COEFFICIENT	STD ERROR	T-STATISTICS	PROB
C	9.562154	3.258005	2.934972	0.0102
INFLR	-0.071298	0.042948	-1.660079	0.1177
MOS	-8.02E-07	4.33E-07	-1.854034	0.0835
R ²	0.949			
Adj. R ²	0.892			
F-Statistic	16.59095			
Pro. F-statistic	0.0000			

Source: E-views 12 Output, 2024.

In the long run, the coefficients of -0.071298 and -8.02E-07 shows that FDI has a negative relationship with both inflation and money supply. However, while the p-value of 0.1177 shows that the long-run effect of inflation on FDI is not significant, the p-value of 0.0835 shows that the long run effect of money supply on FDI is significant at the 10% level.

Results of the ARDL Short-run Relationship

Table 7: ARDL Error Correction Regression; Dependent Variable: D(FDI)

VARIABLES	COEFFICIENT	STD ERROR	T-STATISTICS	PROB
D(INFLR)	-0.050623	0.011375	-4.450430	0.0005
D(MOS)	2.57E-07	8.92E-08	2.877686	0.0115
ECM(-1)	-0.394710	0.054329	-7.265208	0.0000
R ²	0.949			
Adj. R ²	0.892			
F-Statistic	16.59095			
Pro. F-Statistic	0.0000			

Source: E-views 12 Output, 2024.

As expected, the ARDL Error Correction Term (ECT) is negative (-0.394710) and statistically significant at 5 percent level of significance. The coefficient revealed that once there is disequilibrium in the system, it takes an average speed of 39% per year to adjust itself back towards long-run equilibrium level. This means that approximately 39% of the discrepancy in the previous year is adjusted for by the current year. Further, as indicated by the p-values, both inflation and money supply have a significant effect on FDI in the short run. The hypothesis of no significant short-run effect is therefore rejected for both inflation and money supply. However, while increase in inflation has a negative effect on FDI, increase in money supply has a positive effect on FDI.

Post Estimation Diagnostics Tests

Table 8: Post Estimation Diagnostics Tests

Test	P-Value
Heteroscedasticity Test	0.7574
Serial Correlation LM Test	0.6111
JB Normality Test	0.5060

Source: Author’s Computation from E-view 12 Results, 2024.

The result as presented in the above table revealed that there was no evidence of heteroscedasticity, serial correlation, and non-normal distribution of the data in the estimated ARDL-ECM model. The p-values of 0.7574, 0.6111 and 0.5060 lead to the acceptance of the assumption that the model is correctly specified.

DISCUSSION OF FINDINGS

This study revealed that inflation rate has significant negative effect on foreign direct investment in Nigeria in the short run. But in the long run, it is negative but not statistically significant. The negative effect of inflation rate on foreign direct investment in both the long run and short run implies that high levels of inflation might cause a downturn in foreign direct investments. These

findings support the findings of Akpensuen et al. (2020), Kwoba and Kibati (2016), Alshamsi et al. (2015), Omankhanlen (2011), and Udoh and Egwaikhide (2008).

This study showed that money supply has insignificant negative effect on foreign direct investment in Nigeria in the long run. However, the short-run effect of money supply on foreign direct investment is positive and significant. This shows that in the long run, increase in money supply will not affect foreign direct investment, while in the short run, increase in money supply will improve foreign direct investment. This result supports the findings of Mukhtarov et al. (2020); Nouman et al (2015).

CONCLUSION AND RECOMMENDATIONS

The study concludes that low inflation rates in Nigeria encourage foreign direct investment, while high inflation rate discourages foreign direct investment because the value of foreign direct investment inflow is eroded by the inflationary pressure. Hence, reducing inflation rate should be the policy target of monetary authorities if improving FDI is the policy objective. Also, the study concludes that increase in money supply can depreciate the local currency which can result into increase in foreign direct investment, especially in the short run.

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