

Macroeconomic Variables and Foreign Direct Investment: Comparative Analysis of Nigeria and Ghana

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Abstract

The study examined macroeconomic factors that determine foreign direct investment into Nigeria and Ghana. The outcome The Johansen Test, the Augmented Dickey Fuller Test, and Ordinary Least Square OLS. The studies and analysis were carried out using the parsimonious vector error correction model, normalised co-integrating equations, co-integration test, and pairwise causality tests. From Nigeria the study found that real gross domestic product has positive but no significant effect, real interest rate has positive but no significant effect, money supply and inflation rate have positive but no significant effect on foreign investment while exchange rate have negative and no significant effect. The Ghanaian estimated model demonstrated that the cash supply had a positive and huge effect, the expansion rate had a positive however no massive impact, the genuine total national output made a negative and tremendous difference, and the swapping scale affected unfamiliar venture inflow into Ghana. The study suggests that in order to draw foreign direct investment into the nation, government policies that guarantee pricing and macroeconomic stability are necessary. The government should create a sensible foreign exchange rate strategy that would stabilise the currency and attract foreign direct investment.

Keywords: Macroeconomic Variables, Foreign Direct Investment, Comparative Study Nigeria, Ghana

Introduction

One aspect of economic globalisation is foreign direct investment. It involves the exchange of non-debt financial resources between countries. It is the goal of bilateral investment treaties, open economies, partnerships, and economic integration (Wattanakul, 2018). All things considered; unfamiliar direct venture can be followed back to the pioneer time when the frontier aces had the goal of taking advantage of the asset for the advancement of their economies. Financial speculations, for example, asset hole hypothesis expected a straight capacity of developments to unfamiliar capital.

The variables fitting for homegrown speculations could be critical to unfamiliar ventures too like political, monetary, social and geological area of the country. Exact examinations have shown that market size, work cost, work quality, actual foundation advancement, media transmission, level of financial transparency, and government motivators draw in unfamiliar direct speculation (Susic, et al., 2017). Ho and Rashid, (2011) view Economic development, level of transparency, expansion, conversion standard, producing yield, purchaser pay, framework, media transmission, business, the travel industry, and abilities and information as determinants of unfamiliar direct speculation. Ekpo, (2010) recommended that political system, genuine pay per capita, pace of expansion, world loan cost and FICO assessment were urgent variables that assists with clarifying the fluctuation of unfamiliar direct investment into Nigeria. Other macroeconomic elements that fill in as possible determinants of FDI incorporate homegrown paces of return, conversion scale, FDI streams got by other enormous arising economies, unfamiliar monetary execution and unfamiliar loan costs.

Unpredictable exchange rates make global exchange and speculation decisions more problematic in light of the fact that unpredictability increments transformation scale hazard. Conversion scale hazard suggests the likelihood to lose cash on account of an adjustment of the conversion scale. A few exact examinations have explored the connection between swapping scale and FDI inflows. Conversion standard unpredictability seriously influences long-run creation costs. A few exact investigations have examined the connection between FDI and swapping scale changes as far as both the level and unpredictability (Takagi and Shi, 2011; Sharifi-Renani and Mirfatah, 2012; Nishiyama, 2017). Wint and Williams (2002) showed that a steady economy will draw in more foreign direct investment. In this way a low expansion climate is wanted in nations that advance foreign direct investment as a wellspring of capital stream. This study compared the macroeconomic variables that “affect inflow of foreign direct investment in Nigeria and Ghana.”

Literature Review

Product Life Cycle Hypothesis

Vernon (1996) fostered a hypothesis of exchange that endeavored to clarify the propensity for the creation of new merchandise to be gathered in the created nations right off the bat in the existence of the item, however to move to different economies later on. He likewise accentuated in his work that a firm will in general become worldwide at a specific stage in its development. In any case, when the item has advanced in a standard structure and contending items have created, the firm might choose to look abroad for the cheaper areas and new business sectors. Here, it isn't so much that variable data sources might be more affordable abroad yet that considered scale economies from longer creation runs might be gotten through the allotment of part creation and get together to various plants. The item cycle speculation is valuable on a few counts. To begin with, it offers a clarification of the centralization of advancements in created nations, and an incorporated hypothesis of exchange and FDI.

Eclectic Theory

This theory of FDI is recommended by Dunning (1993/2000) and it is frequently alluded to as the OLI worldview. The worldview alludes to three gatherings of conditions that decide if a firm, industry or organization will be a source or a large group of FDI. These gatherings are possession benefits, locational contemplations and disguise gains. Possession benefits are those benefits that are explicit to the firm. The firm appreciates such benefits over homegrown as well as unfamiliar contenders, with the goal that extension in the homegrown market might be an elective methodology. Such benefits relate to innovation and in administration and authoritative abilities, size and enhancement, admittance to or command over unrefined components, the capacity to approach the political help of their administration, admittance to fund based on positive conditions, maybe in unfamiliar as well as homegrown business sectors and the simplicity with which the firm can move creation between two nations. Locational contemplations envelop such things as transport costs confronting completed items and unrefined components, import limitations, the simplicity with which the firm can work in another country, the productivity with which the possession benefits might be joined with considered enriched nations, the assessment approaches in both source and host nations, and political dependability in the host country.

Foreign Direct Investment

The literature has a consensus definition of foreign direct investment (FDI). As such, unfamiliar direct venture (FDI) is a speculation made to get a drawn-out administration stake (frequently 10% of casting a ballot stock) in a corporate firm that works in a country other than the financial backer's nation of origin (World Bank, 1996). These investments can be made through mergers and acquisitions (M&A), which involve buying an existing interest rather than making a new

one, or "greenfield" investments, also known as mortar and brick investments (Udoh & Egwakhide, 2008).

In corporate organization, obligation regarding least 10% of the standard offers or projecting a polling form stock is the model for the presence of a prompt endeavor relationship. FDI includes union and acquirement and new hypothesis, but also near-capital trading between parent associations and their branch-offs, as well as reinvested pay and credits. Countries may participate in adventurous projects in other locations and host foreign direct investment (FDI) initiatives within their own borders. Whereas external FDI involves adventurous projects declared outside its territory. Sub-Saharan Africa depends particularly on FDI for such countless reasons, some of which are enhanced (Ang, 2008). The inclination for FDI comes from its recognized benefits. The work by a few African nations to further develop their business environment originates from the craving to draw from FDI. Indeed, one of the support points on which the New Partnership for Africa's Development (NEPAD) was founded was to increase accessible funding to US\$64 billion through a blend of changes, asset preparation and a helpful climate for Foreign Direct Investment (FDI).

Empirical Review

Sultana (2016) used time-series data from 1981 to 2014 to experimentally investigate how macroeconomic factors affect foreign direct investment inflows into India. According to the empirical study's findings, FDI inflows are negatively correlated with interest rates and inflation, but positively correlated with exchange rates, exports, imports, and economic growth. Furthermore, The Granger causality test identified a one-way causal effect from imports to economic FDI inflows in India, while revealing a bidirectional causal relationship between exports and FDI inflows.

Using annual data from 1970 to 2016, Musyoka and Ocharo (2018) investigated the effects of interest rates, competitiveness, exchange rates, and inflation were analyzed in relation to FDI inflows. Using an OLS approach, researchers found that FDI inflows negatively impacted interest rates and exchange rates, while no significant relationship was observed between inflation and FDI inflows in Kenya. Additionally, various factors affecting FDI inflows across 12 different economies were examined in eastern Africa by Bosire (2018). The researcher employed the GLS estimation method and panel data covering the years 2004–2016. While interest rates have a negative effect on foreign direct investments, the results showed that economic growth and the exchange rate had a favorable effect on FDI inflows. In Ghana, Asiamah et al. (2020) analyzed factors influencing foreign direct investment inflows by employing time-series data from 1985 to 2015 and applying OLS and Granger causality techniques. The Granger causality test indicated a one-way causal relationship between FDI inflows and the interest rate, government spending, inflation, and infrastructure, while the OLS regression's results indicate that changes in FDI inflows may be predicted by these factors. The factors influencing foreign direct investment inflows were examined by Adebayo and Gambiyo (2020) using annual data from Nigeria spanning 36 years (1981–2007). Trade openness, interest rates, and exchange rates are the factors that are used.

Chanegriha et al. (2020) examined the causal relationship between inflows of foreign direct investment and financial development using 136 developed and emerging nations. The researchers' findings, which were based on the Granger causality test, demonstrate that FDI inflows lead to financial development in Estonia, Guyana, Poland, Switzerland, Tajikistan, and Yemen. On the other hand, the monetary development of Gabon, Madagascar, and Poland leads to FDI inflows in the Dominican Republic. Using annual data spanning from 2000 to 2016, Kueh and Soo (2020) "examined the relationship between FDI inflows, market size, trading scale, workforce, and expansion in Cambodia, Laos, Myanmar, and Vietnam." Borhan and

Subramanian (2020) used time-series data from 1975 to 2017 to examine the relationships between FDI inflows, market size, expansion, financial development, switching scale, and exchange transparency in India.

Methodology

The purpose of this study was to investigate the macroeconomic variables that influence foreign direct investment in Ghana and Nigeria. The graphic examination technique, which is typically a semi-test, is the exploration arrangement used in this study. The Central Bank of Nigeria Statistical Bulletin and the World bank information base provided the data used in this investigation. The main method of analysis is Ordinary Least Squares (OLS), which uses annual data from 1987 to 2020 and a variety of relapse techniques throughout a 34-year period. The coefficient of connection (r) of the relapse, the coefficient of assurance (r^2), the student T-test, and the F-test were used to conduct a factual evaluation of the scientific model's global applicability in order to determine the consistent quality of the results obtained. The model specification that:

$$NFDI = f(RGDP, MS, RIR, EXR, IFR) \quad (1)$$

$$NFDI / GDP = \alpha + \beta_1 RGDP + \beta_2 MS + \beta_3 RIR + EXR + \beta_4 IFR + e_i \quad (2)$$

Where:

NFDI = foreign direct investment to gross domestic product,

RGDP = real gross domestic product,

MS = money supply, RIR=real interest rate,

EXR = exchange rate,

IFR = inflation rate,

α = constant,

β_1 to β_4 = coefficients of independent variables,

e_0 = error term

In this investigation, the lagged value of the dependent variables was added to the Augmented Dickey-Fuller (ADF) test, which has the same characteristics as the Dickey-Fuller statistic (Gujarati & Porter, 2009). The availability of a unit root in a time sequence is one of the ADF test targets. Assuming a long-term link or balance connection between two financial series, they are co-incorporated (Gujarati & Porter, 2009). Two approaches can be used to test for co-incorporation among the time series elements: Johansen's co-combination approach, which makes sense for a multivariate series, and the Engle-Granger approach, which is useful in a simple model with two factors (Wakyereza, 2019). This model anticipates determining if the historical value of independent factors helps predict the value of the informative variable. For instance, if A causes B, it is typically referred to as A non-granger causes (Ahmad, 2015). According to Stock and Watson (2011) and Gujarati and Porter (2006), the limited VAR model with co integration limitations embedded into the specification that confines “the long-run behaviour of the endogenous variables until they converge to their co integrating connection”

by an ECT. This is how the multivariate VECM may be constructed when the deterministic pattern terms are disregarded:

$$\Delta Y_t = c + \sum_{i=1}^{p-1} \rho_i \Delta y_{t-1} + \phi E_{t-1} + U_t, \quad t = 1, \dots, T \quad (3)$$

The ECT is represented by $\Delta Y_t = y_t - y_t, E_{t-1}$, and ϕ is the speed of change coefficient of the remedy, the reliant variable is a component of its slack, capability of the slacked upsides of the other regressor in the model, a mistake rectification term, and a stochastic error (Stock and Watson, 2012).

Results and Analysis

Table 1: Unit Root Test

Variable	ADF Statistic	MacKinnon @ 1%	MacKinnon @ 5%	MacKinnon @ 10%	Prob.	Order of int
Unit Root Test at Difference: Nigeria						
NFDI_GDP	-4.504098	-3.711457	-2.981038	-2.629906	0.0008	1(I)
RGDP	-7.727316	-3.661661	-2.960411	-2.619160	0.0000	1(I)
RIR	-4.675882	-3.679322	-2.967767	-2.622989	0.0008	1(I)
MS	-5.348276	-3.661661	-2.960411	-2.619160	0.0001	1(I)
IFR	-5.866560	-3.661661	-2.960411	-2.619160	0.0000	1(I)
EXR	-7.096955	-3.670170	-2.963972	-2.621007	0.0000	1(I)
Unit Root Test at Difference: Ghana						
NFDI_GDP	-6.016159	-3.670170	-2.963972	-2.621007	0.0000	1(I)
MS	-6.725418	-3.670170	-2.963972	-2.621007	0.0000	1(I)
IFR	-6.061187	-3.711457	-2.981038	-2.629906	0.0000	1(I)
EXR	-7.070904	-3.661661	-2.960411	-2.619160	0.0000	1(I)
RGDP	-9.327157	-3.661661	-2.960411	-2.619160	0.0000	1(I)
RIR	-7.435217	-3.670170	-2.963972	-2.621007	0.0000	1(I)

Source: Computed from E-View 9.0

From Table 1, the results performed using E-view version 9.0, as shown above. Furthermore, the outcomes as displayed in the table above show that the factors are fixed, in light of the fact that every one of the outright upsides of the Test insights, no matter what their signs were over the upsides of the 5% basic worth. Along these lines, the factors are fixed at first distinction. We reject the invalid speculation of non-stationary and conclude that they are stationary at first difference and integrated in the order of 1(I).

Table 2: Unrestricted Co-integration Rank Test (Trace)

Hypothesized		Trace	0.05		
Nigeria					
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.**	
None *	0.852945	139.7730	95.75366	0.0000	
At most 1 *	0.712569	80.34767	69.81889	0.0057	
At most 2	0.556258	41.69768	47.85613	0.1674	
At most 3	0.302071	16.50982	29.79707	0.6759	
At most 4	0.158724	5.361061	15.49471	0.7693	
At most 5	0.000102	0.003151	3.841466	0.9535	
Normalized co integrating coefficients (standard error in parentheses)					
NFDI_GDP	RGDP	RIR	MS	IFR	EXR
1.000000	-0.077199 (0.03470)	0.206921 (0.02722)	-0.153896 (0.04375)	0.064228 (0.01508)	0.009616 (0.00285)
Ghana					
None *	0.703476	120.5828	95.75366	0.0004	
At most 1 *	0.661646	82.89832	69.81889	0.0032	
At most 2 *	0.485953	49.30479	47.85613	0.0363	
At most 3	0.438331	28.67615	29.79707	0.0669	
At most 4	0.253536	10.79401	15.49471	0.2245	
At most 5	0.054258	1.729355	3.841466	0.1885	
Normalized co integrating coefficients (standard error in parentheses)					
NFDI_GDP	RGDP	RIR	MS	IFR	EXR
1.000000	-0.000756 (0.00021)	0.018734 (0.06504)	0.020988 (0.43555)	0.726514 (0.18292)	-1.269880 (0.84967)

Source: Researchers' Computed from E-View 9.0

In Table 2, the rule is that when the Trace measurements are more than 5 % percent Critical worth, we reject the null hypothesis. From the results, Nigeria has one co integrating equation while Ghana has two co integrating equation, we conclude the presence of long run combination of the variables within the periods covered in the study.

Table 3: Pair Wise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
Nigeria			
RGDP does not Granger Cause NFDI_GDP	31	0.74392	0.4851
NFDI_GDP does not Granger Cause RGDP		1.25535	0.3017
RIR does not Granger Cause NFDI_GDP	31	0.84116	0.4426
NFDI_GDP does not Granger Cause RIR		2.64238	0.0902
MS does not Granger Cause NFDI_GDP	31	1.53199	0.2350
NFDI_GDP does not Granger Cause MS		0.93225	0.4064
IFR does not Granger Cause NFDI_GDP	31	5.15708	0.0130
NFDI_GDP does not Granger Cause IFR		1.58098	0.2249
EXR does not Granger Cause NFDI_GDP	31	2.16273	0.1353
NFDI_GDP does not Granger Cause EXR		1.70494	0.2015
Ghana			
RGDP does not Granger Cause NFDI_GDP	31	0.67816	0.5163
NFDI_GDP does not Granger Cause RGDP		1.56318	0.2285
RIR does not Granger Cause NFDI_GDP	31	3.93088	0.0322
NFDI_GDP does not Granger Cause RIR		0.25635	0.7758
MS does not Granger Cause NFDI_GDP	31	2.26646	0.1238
NFDI_GDP does not Granger Cause MS		3.83581	0.0347
IFR does not Granger Cause NFDI_GDP	31	0.11702	0.8900
NFDI_GDP does not Granger Cause IFR		0.31374	0.7334
EXR does not Granger Cause NFDI_GDP	31	1.65023	0.2115
NFDI_GDP does not Granger Cause EXR		0.86478	0.4329

Source: Researchers' Computed from E-View 9.0

In Table 3, the study found bidirectional causality from inflation rate to foreign direct investment in Nigeria, while in Ghana, the study found a uni-directional causality from real interest rate to net foreign direct investment while other variable are not causally related in the models.

Table 4: VAR Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
Nigeria						
0	-589.1245	NA	6.85e+09	39.67497	39.95521	39.76462
1	-491.5351	149.6372*	1.19e+08*	35.56900*	37.53068*	36.19656*
2	-431.8170	67.68044	33547046	33.98780	37.63091	35.15326
3	-370.3691	45.06180	16644018	32.29127	37.61582	33.99464
Ghana						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-842.1460	NA	1.45e+17	56.54307	56.82331	56.63272
1	-749.3034	142.3587	3.46e+15	52.75356	54.71524*	53.38112
2	-703.0548	52.41510*	2.39e+15*	52.07032	55.71343	53.23578
3	-654.7234	35.44304	2.85e+15	51.24822*	56.57277	52.95159*

Source: Researchers' Computed from E-View 9.0

Table 4, in the first place, these models figured out how to get the right slack length to some extent half of the time in little example. Second, this presentation increment considerably as test size develops. Third, with generally enormous example (31 years), HQC is found to outperform the rest accurately distinguishing the genuine slack length. Interestingly, AIC and FPE should

be a superior decision for more modest example. Fourth, AIC and FPE are found to create minimal likelihood of under assessment among all standards under study. At long last, the issue of over assessment, be that as it may, is irrelevant in all cases. From the results, the study adopt lag 1 for analysis.

Table 5: Regression Results

Table 3: Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Nigeria				
C	-0.018385	0.226108	-0.081312	0.9359
D(RGDP(-1))	0.036851	0.060643	0.607672	0.5491
D(RIR(-1))	0.014996	0.023336	0.642620	0.5266
D(MS(-1))	0.109964	0.122118	0.900478	0.3768
D(IFR(-1))	0.032763	0.016103	2.034601	0.0531
D(EXR(-1))	-0.002463	0.010523	-0.234029	0.8169
ECM(-1)	-0.821579	0.192553	-4.266767	0.0003
R-squared	0.566215	Mean dependent var		-0.006097
Adjusted R-squared	0.457768	S.D. dependent var		1.484247
S.E. of regression	1.092946	Akaike info criterion		3.211310
Sum squared resid	28.66873	Schwarz criterion		3.535113
Log likelihood	-42.77530	Hannan-Quinn criter.		3.316862
F-statistic	5.221151	Durbin-Watson stat		1.684401
Prob(F-statistic)	0.001456			
Ghana				
C	10.49593	0.472932	4.244326	0.0003
RGDP	-6.118506	0.414505	-5.432553	0.0000
RIR	-0.010715	0.005519	-1.941467	0.0636
MS	0.168550	0.040597	4.151790	0.0003
IFR	0.028970	0.017657	1.640705	0.1134
EXR	-0.209675	0.087767	-2.388997	0.0248
ECM(-1)	0.705678	0.145756	4.841486	0.0001
R-squared	0.727386	Mean dependent var		18.49841
Adjusted R-squared	0.661958	S.D. dependent var		2.151871
S.E. of regression	1.251127	Akaike info criterion		3.476607
Sum squared resid	39.13297	Schwarz criterion		3.797236
Log likelihood	-48.62570	Hannan-Quinn criter.		3.582886
F-statistic	11.11744	Durbin-Watson stat		1.447731
Prob(F-statistic)	0.000005			

Source: Researchers' Computed from E-View 9.0

According to Table 5, the estimated model demonstrates that the macroeconomic factors as modelled in Nigeria can account for 45.7 percent of the variation in net foreign direct investment, but in Ghana, the variables can account for 66.1 percent. The Durbin Watson statistic revealed no serial autocorrelation, and the f-probability indicates that the model is statistically significant. According to the ECM coefficient, Ghana's yearly rate of variable adjustment to equilibrium is 70.5%, whereas Nigeria's is 82.1 percent. Real gross domestic products have a positive impact on net foreign direct investment in Nigeria, according to the variables' beta coefficient. Real interest rates have a favorable impact on Ghana's net foreign direct investment. Whereas Nigeria's net foreign direct investment is positively impacted. In Ghana money supply variable has a negative effect on net foreign direct investment, but in Nigeria, the money supply has a positive effect. Net foreign direct investment in Nigeria is positively impacted by the inflation rate, while net foreign direct investment in Ghana is

positively impacted as well. Both countries' net foreign direct investment is negatively impacted by the money exchange rate.

Discussion of Findings

From Nigeria the study found that real gross domestic product has positive but no significant effect, real interest rate has positive but no significant effect, money supply and inflation rate have positive but no significant effect on foreign investment while exchange rate have negative and no significant effect. The variables added 0.03, 0.01, 0.1 and 0.03 to foreign direct investment while exchange rate reduced foreign investment by 0.002. The estimated model from Ghana demonstrated that the money supply has a positive and significant influence on foreign investment inflows in Ghana, while the inflation rate has a positive but insignificant effect. The study's empirical results are consistent with Sultana's (2016) findings that foreign direct investment inflows are negatively correlated with interest rates and inflation, but positively correlated with exchange rates, exports, imports, and economic growth. These results are also in line with those of Musyoka and Ocharo (2018), who found that while exchange rates and economic growth have a favourable effect on FDI inflows, Interest rates were found to have a negative effect. Using Granger and OLS causality techniques Asiamah et al (2020) discovered that changes in FDI inflows can be predicted by government expenditure, infrastructure and external debt, while the Granger casualty test shows a one-way casualty running from the interest rate, inflation, government expenditure to FDI inflows.

Conclusion

The study looks at how macroeconomic factors affect foreign direct investment into Ghana and Nigeria. The study also finds that net foreign direct investment in Nigeria is positively impacted by real gross domestic products. The real interest rate has a favorable impact on net direct foreign investment in Nigeria, but the variable has a negative impact on net direct foreign investment in Ghana. The money supply positively influences net foreign direct investment (FDI) in Nigeria but has a negative effect on net FDI in Ghana. While the money supply also shows a positive effect on Ghana's net FDI, inflation has a favorable impact on net FDI in Nigeria. Both countries' net foreign direct investment is negatively impacted by the money exchange rate, but Ghana's net foreign direct investment is positively impacted as well. According to the study's findings, the variables were stationary at difference, and the cointegration results demonstrated that Ghana has two cointegrating equations, but Nigerian variables only have one.

Recommendations

The study recommends that:

- i. The government must implement policies to maintain macroeconomic and pricing stability in order to attract foreign direct investment.
- ii. The government should create a sensible foreign exchange rate policy that will stabilize the currency to attract foreign direct investment.
- iii. To boost economic growth, the government must strengthen the climate to attract foreign direct investment
- iv. Monetary authorities in the both countries should ensure adequate money circulation in the economy to ensure financial stability that attracts foreign investors.
- v. Policies such as monetary and fiscal policies should be well advanced to ensure low inflation and achieve price stability in the economy

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