THE EFFECTS OF MACROECONOMIC RISK FACTORS ON FOREIGN DIRECT INVESTMENT IN NIGERIA.

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Abstract

This study analyses how macroeconomic risk factors impact foreign direct investment in Nigeria. The data used covers the period from 1990 to 2021. Macroeconomic risk factors were measured by interest rates, exchange rates, trade openness, and GDP growth. The findings reveal that interest rates, exchange rates, trade openness, and GDP growth have no long-run effect on foreign direct investment. Furthermore, interest rates and trade openness have a significant positive short-run effect on foreign direct investment. The exchange rate has a significant negative short-run effect on foreign direct investment, while GDP growth has no significant short-run effect on foreign direct investment. The study recommends that the government create a positive economic environment to attract foreign investors.

Keywords: Interest rates, Exchange rates, Trade openness, GDP growth

1.0 Introduction

Nigeria relies on foreign investment as an import-dependent economy to meet its investment needs. Since May 1999, when democratic governance was established, the country has taken concrete steps to attract cross-border investors to its domestic economy. These measures include repealing laws that hinder investment, enacting new investment laws, implementing business-friendly policies, improving import and export processes, combating fraud, and

establishing an economic and financial crimes commission (EFCC). As a result, Nigeria's foreign capital inflows have been positively impacted (Uremadu, 2011; Okafor et al., 2015).

Nigeria's economy has been heavily reliant on crude oil as the primary source of foreign exchange, making it a monocultural economy. However, the price and production of oil are subject to international market fluctuations, which can lead to significant revenue fluctuations. This is why monocultural economies often lack investment capital (Okafor, 2012; Okafor et al., 2015). According to the UNCTAD (2000), the sub-Saharan Africa (SSA) region needs to increase its domestic investment rate to approximately 25% annually to achieve a sustainable economic growth rate of 6% annually. Gwenhamo (2011) and Odhiambo (2022) posited that foreign capital inflows are crucial to filling the resource gap in developing and emerging economies. It was recommended that these countries focus on attracting foreign direct investment (FDI) to drive technological advancements.

Foreign direct investment is creating new businesses or acquiring existing companies and assets in another country. It involves making direct physical investments in the owners of assets in that country. To attract FDI, countries develop incentive policies tailored to their individual needs (Wei & Zhu, 2007; Sujit et al., 2020). FDI indicate a country's potential for economic growth and investment opportunities. The financial market's performance is often linked to FDI. It is a critical factor for the economic growth of both developed and developing nations (Hiratsuka, 2006; Tan & Goh, 2018). Governments often struggle to generate enough revenue in developing economies to meet their expenditure needs, FDI can help fill this gap. FDI also brings technological advancements, including those embodied in goods, services, people and organizational structures, and those embodied in designs, technical knowledge, training and blueprints (Adegbite & Ayadi, 2011).

According to Ukachukwu and Odionye (2020), FDI can significantly promote a country's economic growth. FDI brings in capital from abroad, which can help fill the investment gap in a country. This additional capital can be used for various purposes, such as expanding productive capacity, upgrading infrastructure, and investing in research and development. Increased investment can lead to higher levels of production, job creation, and improved productivity, all of which contribute to economic growth. Moreover, FDI can create employment opportunities in the host country. When foreign companies establish operations, they typically hire local workers, reducing unemployment and generating income for individuals and households. Moreover, working in foreign firms can provide exposure to new

skills and knowledge, contributing to human capital development and the overall productivity of the workforce.

FDI is considered an important source of foreign capital for industrialisation and growth in developing countries. It is often seen as a driving force for economic expansion on a global scale. Despite this, FDI inflows in developing countries have been lower than in developed countries. Studies show that foreign investors are interested in countries with stable macroeconomic conditions and low investment risks, such as steady prices, high economic growth rate, a less volatile exchange rate, and increased GDP. Unfortunately, Nigeria faces macroeconomic instability due to various disturbances in these variables. For example, the decline in global oil prices has reduced foreign reserves and the country's GDP growth rate.

The impact of macroeconomic risk factors on Nigeria's foreign direct investment (FDI) is still unresolved and requires further investigation in the literature. Several studies (Oladipo, 2013; Onuorah & Okoli, 2013; Emenuga, 2019; Ukachukwu & Odionye, 2020; Adebayo et al., 2021) have explored the influence of macroeconomic variables on foreign direct investment in Nigeria, but they have produced conflicting and inconclusive results.

The main objective of this study is to examine the effect of macroeconomic risk factors on foreign direct investment in Nigeria. The specific objectives were:

i. To investigate the effect of the exchange rate on foreign direct investment in Nigeria
ii. To ascertain the impact of GDP growth on foreign direct investment in Nigeria
iii. To examine the effect of interest rates on foreign direct investment in Nigeria
iv. To explore the effect of exchange rate on foreign direct investment in Nigeria

2.0 Review of Literature

Dunning (1988; 1995) created the eclectic paradigm, a useful conceptual framework for understanding FDI. According to the paradigm, a country's ability to attract foreign direct investment depends on three main factors. The first factor is the firm's ownership advantages, reflected in its resources and capabilities. Second, the host country's location-specific advantages, including tangible and intangible resources that contribute to creating a favourable business environment; and third, organisational forms refer to how companies leverage their ownership advantages with location advantages to enhance and sustain their competitive edge.

According to Dunning (1993), three advantages encourage firms to invest overseas. However, this paper will only discuss location-specific advantages, as they are crucial in the decision-making process for firms engaging in FDI. Location advantages refer to factors specific to a country that could impact a company's market opportunities and potential risks. According to Kiymaz (2009) and Boateng et al. (2015), when considering investing in a foreign market, the investor needs to choose a relatively lower risk than similar investments in other markets. Market potential and risk can be evaluated using macroeconomic characteristics such as gross domestic product, interest rate, capital market indicators, exchange rate, and inflation (Kiymaz, 2009; Boateng et al., 2014).

Boateng et al. (2015) analyzed the effects of macroeconomic factors on foreign direct investment (FDI) inflows in Norway using quarterly time series data from 1986 to 2009. The data analysis was conducted using Fully Modified OLS (FMOLS) and the vector autoregressive and error correction model (VAR/VECM). The results showed that real GDP, sector GDP, exchange rate, and trade openness significantly positively impacted FDI inflows. Conversely, the money supply, inflation, unemployment, and interest rates significantly negatively affected FDI inflows.

Emenuga (2019) used the auto-regressive distributed lag (ARDL) method to analyze the effect of macroeconomic factors on foreign direct investment in Nigeria between 1986 and 2017. The findings show that gross domestic product and interest rates positively and significantly affect FDI inflows in the long run. On the other hand, government size and inflation have no significant impact on FDI inflows in the long term. Additionally, the exchange rate negatively and significantly affects FDI inflows in the long run. In the short run, the exchange rate, government size, gross domestic product, and interest rate positively and significantly impact FDI inflows. However, inflation does not significantly affect FDI inflows in the short run.

Ukachukwu and Odionye (2020) used the auto-regressive distributed lag (ARDL) method to analyze the effect of macroeconomic factors on foreign direct investment in Nigeria between 1981 and 2017. The study found that foreign exchange rates and crude oil prices positively and significantly impacted FDI in the short and long term. On the other hand, inflation negatively and significantly affected FDI in the short and long term. Additionally, while the real gross domestic product had a positive and significant effect on FDI in the short term, its impact was not significant in the long term.

Adebayo et al. (2021) used the auto-regressive distributed lag (ARDL) method to investigate the impact of macroeconomic factors on foreign direct investment (FDI) in Nigeria from 1981 to 2018. The study revealed that exports and trade openness significantly positively affect FDI inflows in the long run. In contrast, real growth, gross capital formation, and inflation have an insignificant impact on FDI inflows in the long run. Additionally, exports significantly negatively impact FDI inflows in the short run. However, trade openness, real growth, gross capital formation, and inflation do not significantly impact FDI inflows in the short run.

3.0 Methodology

The research method employed is an ex post facto design. The study utilized secondary annual time-series data from 1990 to 2021 from the World Bank Development Indicators Database and

Statistical Bulletin by the Central Bank of Nigeria.

Model Specification

To evaluate the impact of macroeconomic risk factors on FDI in Nigeria, the study modified and adapted Ukachukwu and Odionye's (2020) model. The model is specified as follows:

$FDI_t = \beta_0 + \beta_1 GGR_t + \beta_2 EXR_t + \beta_3 ITR_t + \beta_4 TOP_t + et$ .... (1)

Where:

FDI = Foreign Direct Investment

GGR = Gross Domestic Product Growth Rate

EXR = Exchange Rates

ITR = Interest Rates

TOP = Trade Openness

et = Error term

β_0, β_1, β_2, β_3 and β_4 = Parameters

Table 3.1 Measurement of Variables

Variable	Measurement	Sources
Dependent Variable		
Foreign Direct Investment		(Oladipo, 2013)(Emenuga, 2019)
Independent Variables		
Gross Domestic Product Rate	The annual percentage increase of gross domestic product (GDP) at market value	(Oladipo, 2013) (Ukachukwu & Odionye, 2020)
Exchange Rates	Official exchange rate (US$)	(Oladipo, 2013)(Emenuga, 2019)
Interest rates	Bank lending rate	(Oladipo, 2013)(Emenuga, 2019)
Trade Openness	Trade refers to the total value of goods and services exported and imported, expressed as a percentage of the gross domestic product.	(Oladipo, 2013)(Emudainohwo, 2019)

4.0 Result and Discussion.

4.1 Descriptive Analysis

Table 4.1: Descriptive Statistics of Variables

	Mean	Minimum	Maximum	Standard deviation
FDI ($ million)	3,390	2,300	8,910	775
GDP Growth Rate	4.3201	-2.0352	15.3292	4.0172
Trade Openness	36.1602	16.3522	53.2780	9.3940
Interest rate	18.9438	11.4831	31.6500	3.8891
Exchange rate	137.7830	8.0382	400.000	106.8939
Observations	32	32	32	32

Source: Authors' Computation, 2023

The descriptive statistics analysis revealed that the mean FDI inflow into the country was $3.39 billion. The maximum inflow was $8.91 billion, while the minimum was $2.3 billion. The standard deviation was $0.775 billion. Additionally, the annual GDP growth rate during the same period had a mean of 4.3 per cent, with a maximum of 15.3 per cent and a minimum of -2.0 per cent. The standard deviation was 4.0 per cent. The mean trade openness was 36.16, with a maximum of 53.28 and a minimum of 16.35. However, the interest rate had a mean of 18.94

per cent, with a maximum of 31.65 per cent and a minimum of 11.48 per cent. The standard deviation was 3.89 per cent. Finally, the foreign exchange rate had a mean of ₦137.78 to a US dollar (USD), with a maximum of ₦400 to a USD and a minimum of ₦8 to a USD.

4.1.2 Correlation Analysis

The Spearman Correlation Coefficient (correlation matrix) and Variance inflation factor (VIF) are used to investigate the presence of a correlation between the variables. Multicollinearity may result in a misleading regression result. This section also discusses the results of the correlation between the dependent and independent variables.

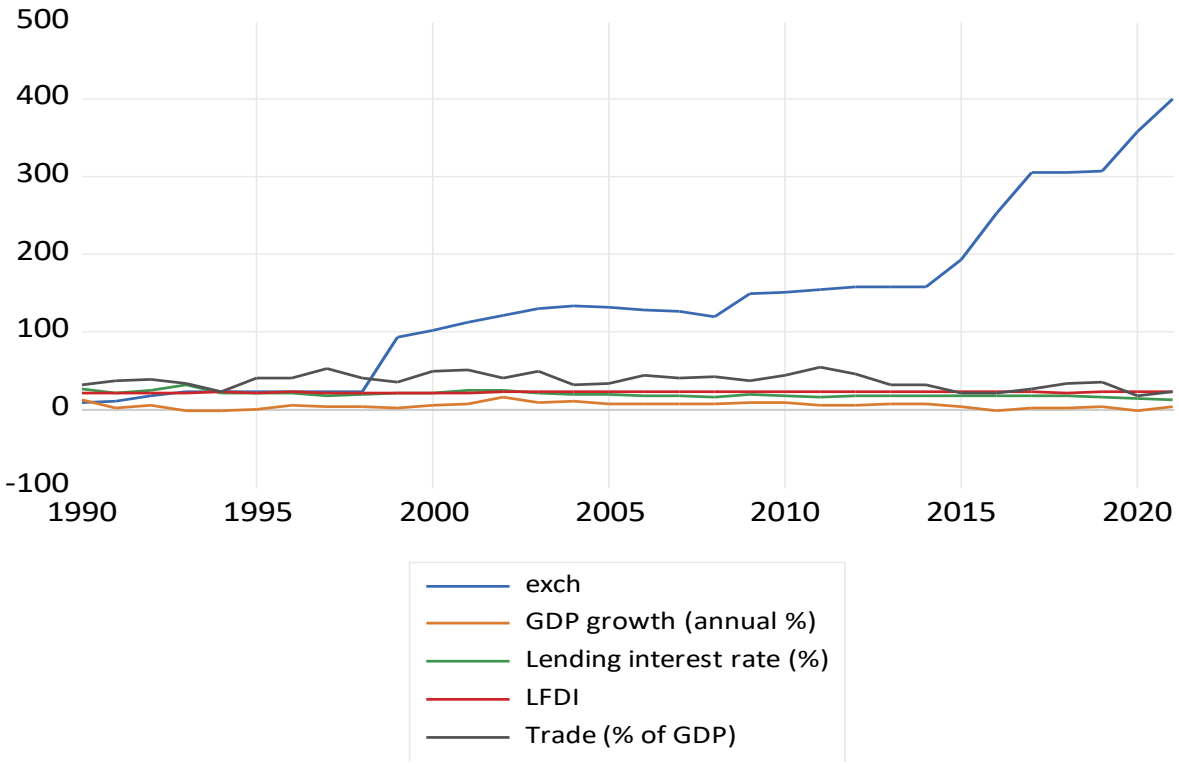
Table 4.2 Correlation matrix

	FDI	GGR	EXR	ITR	TOP
FDI	1.0000				
GGR	0.2788	1.0000			
EXR	0.2243	-0.1410	1.0000		
ITR	-0.4678	0.1234	-0.6570	1.0000	
TOP	0.1369	0.3817	-0.4725	0.2288	1.0000

Source: Authors' Computation, 2023

The correlation matrix for the independent and dependent variables is presented in Table 4.2. The correlation matrix indicates that the GDP growth rate is positively correlated with trade openness (0.3817), and FDI is positively correlated with GGR (0.2788); however, a negative correlation exists between the exchange rate and interest rate (-0.6570).

Figure 4.1 Trend Movement



4.1.3 Unit Root Test

Table 4.3 displays the results of the Augmented Dickey-Fuller test for unit roots.

Table 4.3: ADF Unit Root Test (ADF Regression with Intercept and a Linear Trend)

Variables	Order of Integration	T- Statistics ADF	Critical ADF Statistics	Probability
FDI	I(0)	-4.8512	-3.6032	0.0035
GGR	I(0)	-3.6256	-2.9604	0.0109
EXR	I(I)	-3.7600	-2.9640	0.0008
ITR	I(0)	-3.9417	-3.5629	0.0220
TOP	I(I)	-5.4222	-2.9678	0.0001

Source: Authors' Computation, 2023

The unit root test results show that the variables are stationary at the level and the first-order difference. The likelihood of cointegration between these variables is investigated using the ARDL-bound cointegration test (Pesaran et al., 2001).

4.1.4 ARDL Bound Cointegration Test

According to Table 4.4, the F-statistic is 9.5089, higher than the 5% significance level limit of 4.37. Therefore, we conclude that there is cointegration in the model and reject the null hypothesis. This means a long-term connection exists between the independent variables (interest rate, trade openness, exchange rate, and GDP growth rate) and foreign direct investment. Consequently, we analyse the ARDL regression models for short- and long-run periods.

Table 4.4: ARDL Bound Test Result

F-STATISTICS	**CRITICAL VALUES BOUNDS**		
9.5089	Significant level	I(0)	I(1)
	10%	2.2	3.09
	5%	2.56	3.49
	1%	3.29	4

Source: Authors' Computation, 2023

4.2 Econometric Analysis

This section will explore the short- and long-term connections between foreign direct investment and macroeconomic characteristics.

4.2.1 The Long Run ARDL

Table 4.5 Long Run ARDL

Variable	Coefficient	T-Stat	P-value
C	7.3443	2.0979	0.0471**
LFDI(-1)	0.6558	4.4665	0.0002***
EXR	0.0008	0.6691	0.5101
GGR	0.0256	0.9025	0.3762
GGR(-1)	0.02105	0.8313	0.4143
ITR	-0.0046	-0.1476	0.8840
TOP	-0.0012	-0.1086	0.9145
R-squared	0.6825		
F-Statistics Prob.	8.2383 0.0000***		

Source: Authors' Computation, 2023

The R-squared statistics reveal how much the independent variables (EXR, GGR, ITR, and TOP) contribute to the explained variable's (FDI) variation. In this case, these variables account for approximately 68% of the variation in FDI.

Exchange Rate

Table 4.5 shows an insignificant correlation between exchange rates and foreign direct investments, as indicated by the coefficient (0.0008) and P-value (0.5101) at a significance level of 5 per cent. This means that exchange rates do not long-term impact foreign direct investments. These findings are consistent with those of Tripathi et al. (2015) but contradict the results of Ukachukwu and Odionye (2020), who found a significant positive relationship between exchange rate and FDI.

GDP Growth Rate

Based on the coefficient (0.0256) and P-value (0.3762) at the 5% significance level, the GDP growth rate does not significantly impact foreign direct investments in the long run. This finding aligns with Bichanga's (2016) results but differs from the findings of Ukachukwu and Odionye (2020), who found a significant positive correlation between the two variables.

Interest rate

Based on the coefficient (-0.0046) and P-value (0.8840) at the 5% significance level, it can be inferred that the interest rate does not significantly impact foreign direct investments in the

long run. These results are similar to those of Adebayo and Gambiyo (2020) but contradict the findings of Musyoka and Ocharo (2018), who found a significant negative relationship between interest rate and FDI.

Trade Openness

The coefficient (-0.0012) and P-value (0.9145) at the 5 per cent significance level indicate that trade openness does not significantly impact foreign direct investments in the long run. This implies that trade openness does not affect foreign direct investments. Our findings are consistent with Sujit et al. (2020) but differ from the results of Awad (2020), who found a negative relationship between trade openness and FDI.

4.2.2 The Short Run ARDL (Error Correction Model)

Table 4.6 Short Run ARDL

Variable	Coefficient	T-Stat	P-value
C	0.1748	1.9577	0.0637*
d(LFDI(-1))	0.8263	2.5145	0.0201**
d(EXR)	-0.0132	-2.9073	0.0084***
d(GGR)	-0.0358	-1.3496	0.1915
d(GGR(-1))	-0.0017	-0.0850	0.9331
d(ITR)	0.0493	1.8987	0.0714*
d(TOP)	0.0199	1.9225	0.0682*
ECM(-1)	-1.4768	-3.8455	0.0009***
R-squared	0.5161		
F-Statistics Prob.	3.1997 0.0181**		

Source: Authors' Computation, 2023

The R-squared statistics reveal how much the independent variables (EXR, GGR, ITR, and TOP) contribute to the explained variable's (FDI) variation. In this case, these variables account for approximately 52% of the variation in FDI.

The Error Correction Model (ECM) is a tool that assesses the long-term relationship between variables while also accounting for short-term fluctuations. According to Table 4.6, the ECM coefficient is significant and is -1.4768. This means that macroeconomic risk factors, such as exchange rate, real GDP growth rate, interest rate, and trade openness, correct around 147.68% of the previous period's imbalance in foreign direct investment.

Exchange Rate

According to the results in Table 4.6, there is a significant negative link between the exchange rate and foreign direct investments. This is indicated by the coefficient (-0.0132) and P-value (0.0084) at a significance level of 5 per cent. This implies that a rise in the exchange rate could cause a decrease in foreign direct investments in the short term.

GDP Growth Rate

The impact of the GDP growth rate on foreign direct investments is insignificant. This is supported by a coefficient of -0.0358 and a P-value of 0.1915, both at a 5% significance level. Therefore, the GDP growth rate has no short-term impact on foreign direct investments.

Interest Rate

The interest rate significantly positively affects foreign direct investments, as shown by the coefficient (0.0493) and P-value (0.0714) at the 5 per cent significance level. This implies that an increase in interest rate will lead to an increase in foreign direct investments in the short run.

Trade Openness

Trade openness significantly positively affects foreign direct investments, as shown by the coefficient (0.0199) and P-value (0.0682) at the 5 per cent significance level. This implies that increased trade openness will increase foreign direct investments in the short run.

4.3 Diagnostic Test

Table 4.7: Results of diagnostic tests

	X^2 -statistic	Probability
Breusch-Godfrey Serial Correlation LM Test	0.0764	0.9268
Heteroskedasticity Test: Breusch-Pagan-Godfrey	0.7120	0.6626
Jarque-Bera test	0.4274	0.8076

Source: Authors' Computation, 2023

The model was tested for serial correlation, indicating no serial correlation (p-value = 0.9268 > 0.05). The model was subjected to a heteroscedasticity test, and the results indicated that the residual variance is constant (Prob-Value = 0.6626 > 0.05). The Jarque-Bera test is a normality test (Prob-Value = 0.8076 > 0.05). We conclude that the population is normally distributed.

5.0 Conclusion and recommendations.

The study examines the effect of macroeconomic risk factors on foreign direct investment in Nigeria, using data from 1990 to 2021. Macroeconomic risk factors were proxied by interest

rates, exchange rates, trade openness, and GDP growth. The study conducted a long-term analysis using the ARDL bounds test, as the macroeconomic risk factors being studied have mixed levels of integration of I(0) and I(1). This testing confirmed a correlation between FDI inflows and macroeconomic risk factors. The findings reveal that interest rates, exchange rates, trade openness, and GDP growth have no long-run effect on foreign direct investment. Moreover, Interest rates and trade openness have a significant positive short-run effect on foreign direct investment. The exchange rate has a significant negative short-run effect on foreign direct investment, while GDP growth has no significant short-run effect on foreign direct investment.

The following recommendations are suggested based on the findings of this study: The government needs to create a favourable economic environment that can attract foreign investors to the country. This can be done by implementing policies that support stable exchange rates, which are crucial for any business environment. Additionally, governments should encourage trade liberalization to increase the flow of foreign direct investment into the economy. An open economy tends to attract more investment.

References

Adebayo, E., & Gambiyo, S. (2020). Economic analysis of the determinants of foreign direct investment (FDI) in Nigeria. *Arch Bus Res*, *8*(1), 74–81.

Adebayo, T., Onyibor, K., & Akinsola, G. (2021). The impact of major macroeconomic variables on foreign direct investment in Nigeria: evidence from a wavelet coherence technique. *SN Business & Economics*, *1*(1), 1–24.

Adegbite, E., & Ayadi, F. (2011). The role of foreign direct investment in economic development: A study of Nigeria. *World Journal of Entrepreneurship, Management and Sustainable Development*, *6*(1/2), 133–147.

Awad, A. (2020). Foreign direct investment inflows to Malaysia: Do macroeconomic policies matter? *Journal of International Studies*, *13*(1), 196–211.

Bichanga, C. B. (2016). *The relationship between exchange rates volatility and foreign direct investments in Kenya*. University of Nairobi.

Boateng, A., Hua, X., Nisar, S., & Wu, J. (2015). Examining the determinants of inward FDI: Evidence from Norway. *Economic Modelling*, *47*(4), 118–127.

Boateng, A., Hua, X., Uddin, M., & Du, M. (2014). Home country macroeconomic factors on outward cross-border mergers and acquisitions: Evidence from the UK. *Research in*

International Business and Finance, *30*, 202–216.

Dunning, J. (1988). The theory of international production. *The International Trade Journal*, *3*(1), 21–66.

Dunning, J. (1993). *Multinational Enterprises and the Global Economy*. Addison Wesley.

Dunning, J. (1995). Reappraising the eclectic paradigm in an age of alliance capitalism. *Journal of International Business Studies*, *26*, 461–491.

Emenuga, P. (2019). Impact of macroeconomic variables on Foreign Direct Investment Flow in Nigeria: ARDL Model. *African Journal of Accounting and Financial Research*, *2*(1), 1–10.

Emudainohwo, O. B. (2019). Impacts of macroeconomic indicators on inward foreign direct investment in Nigeria: 1981–2016. *Sahel Analyst: Journal of Management Sciences*, 45–65.

Gwenhamo, F. (2011). Foreign direct investment in Zimbabwe: The role of institutional and macroeconomic factors. *South African Journal of Economics*, *79*(3), 211–223.

Hiratsuka, D. (2006). *Outward FDI from and intraregional FDI in ASEAN: trends and drivers* (No. 77).

Kiymaz, H. (2009). The impact of country risk ratings on US firms in large cross-border acquisitions. *Global Finance Journal*, *20*(3), 235–247.

Musyoka, N., & Ocharo, K. N. (2018). Real interest rate, inflation, exchange rate, competitiveness and foreign direct investment in Kenya. *American Journal of Economics*, *3*(1), 1–18.

Odhiambo, N. M. (2022). Foreign direct investment and economic growth in Kenya: An empirical investigation. *International Journal of Public Administration*, *45*(8), 620–631.

Okafor, E., Ezeaku, C., & Eje, C. (2015). Foreign investment and its effect on the economic growth in Nigeria: A triangulation analysis. *IOSR Journal of Economics and Finance*, *6*(4), 1–7.

Okafor, H. O. (2012). Do domestic macroeconomic variables matter for foreign direct investment inflow in Nigeria. *Research Journal of Finance and Accounting*, *3*(9), 55–67.

Oladipo, S. O. (2013). Macroeconomic determinant of foreign direct investment in Nigeria (1985-2010): A GMM approach. *Journal of Emerging Issues in Economics, Finance and Banking*, *2*(4), 801–817.

Onuorah, C., & Okoli, N. (2013). Long run relationship between macroeconomic variables and FDI in Nigeria. *Developing Country Studies*, *3*(1), 162–169.

Pesaran, M., Shin, Y., & Smith, R. (2001). Bounds testing approaches to the analysis of level

relationships. *Journal of Applied Econometrics*, *16*(3), 289–326.

Sujit, K. S., Kumar, B. R., & Oberoi, S. S. (2020). Impact of macroeconomic, governance and risk factors on FDI intensity—An empirical analysis. *Journal of Risk and Financial Management*, *13*(12), 1–14.

Tan, B. W., & Goh, S. K. (2018). The surge in intra-ASEAN outward foreign direct investment and its key determinants: Evidence using pooled mean group approach. *International Journal of Business & Society*, *19*(2), 347–362.

Tripathi, V., Seth, R., & Bhandari, V. (2015). Foreign direct investment and macroeconomic factors: evidence from the Indian economy. *Asia-Pacific Journal of Management Research and Innovation*, *11*(1), 46–56.

Ukachukwu, O., & Odionye, J. (2020). Impact of selected macroeconomic variables on foreign direct investment in Nigeria: Auto-Regressive Distributed Lag (ARDL) model. *International Journal of Economics, Commerce and Management, United Kingdom*, *9*(12), 41–55. www.abjournals.org

UNCTAD. (2000). *World investment report: Cross-border mergers and acquisitions and development*.

Uremadu, S. O. (2011). Foreign direct investment, liquidity and real country growth: evidence from Nigeria. *International Review of Business Research Papers*, *7*(3), 170–193.

Wei, S. Z. C., & Zhu, Z. (2007). A revisit to the outward FDI determinants: further evidence from count panel data models with fixed effects. *Applied Economics Letters*, *14*(11), 809–812.