

Macroeconomic Factors and Foreign Direct Investment: A Comparative Study of Nigeria and South Africa

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ABSTRACT

This study examined macroeconomic factors that determine foreign direct investment into Nigeria and South Africa. The effect Time series data was sourced from Central Bank of Nigeria Statistical Bulletin and World bank data base from 1987-2017. Net foreign direct investment to gross domestic product was modeled as the function of exchange rate, real interest rate, real gross domestic product, inflation rate and money supply. The null Hypotheses (H_0) were tested at 0.05 level of significance, Ordinary Least Square (OLS), Augmented Dickey Fuller Test, Johansen Co-integration test, normalized co-integrating equations, parsimonious vector error correction model and pair-wise causality tests were used to conduct the investigations and analysis. The adjusted R^2 shows that the independent variables can explain 45.2 percent in foreign direct investment while the variables explained 53.4 percent of foreign direct investment to South Africa. the study found that money supply, inflation rate, gross domestic products and real interest rate have positive relationship with foreign direct investment inflow into Nigeria economy while exchange rate have negative effect on foreign direct investment inflow to Nigeria economy. The positive effect of the variables confirms the a-priori expectation of the study. The study found that money supply, real interest rate and inflation rate have negative effect on foreign direct investment to South Africa while gross domestic product and exchange rate have positive effect on foreign direct investment to South Africa. The study recommends that Policies of the government to ensure price stability and macroeconomic stability are required to attract foreign direct investment into the country. Government should formulate sound foreign exchange rate policy that will attract foreign direct investment through exchange rate stability.

Keywords: *Macroeconomic Factors, Foreign Direct Investment, Nigeria, South Africa*

SECTION 1: INTRODUCTION

Foreign direct investment is the feature of economic globalization. It is the transfer of non-debt financial resource among nations. It is the objective of economic integration, partnership, open economy, bilateral investment treaties (Wattanukul, 2018). Historically, foreign direct investment can be traced back to the colonial era when the colonial masters had the intention of exploiting the resource for the development of their economies. Economic theories such as resource gap theory assumed a linear function of growths to foreign capital.

Factors that determine foreign direct investment to the developing countries remain a matter of concern to policy makers as foreign direct investment have been seen as factor that determine economic growth and development. The factors appropriate for domestic investments could be of great importance to foreign investments as well such as political, economic, social and cultural and geographical location of the country. Empirical studies have shown that market size, labor cost, labour quality, physical infrastructure development, telecommunication, degree of economic openness, and government incentives attract foreign direct investment (Susic, et al., 2017). while Ho and Rashid, (2011) regard Economic growth, degree of openness, inflation, exchange rate, manufacturing output, consumer income, infrastructure, telecommunication, employment, tourism, and skills & knowledge as determinants of foreign direct investment. Ekpo, (2010) suggested that political regime, real income per capita, rate of inflation, world interest rate and credit rating were crucial factors that helps to explain the variability of foreign direct investment into Nigeria. Other macroeconomic factors that serve as potential determinants of FDI include domestic rates of return, exchange rate, FDI flows received by other big emerging economies, foreign economic performance and foreign interest rates.

Volatile exchange rates make international trade and investment decisions more difficult because volatility increases exchange rate risk. Exchange rate risk refers to the potential to lose money because of a change in the exchange rate. Several empirical studies have investigated the link between exchange rate and FDI inflows. Exchange rate volatility severely affects long-run production costs. Several empirical studies have analyzed the relationship between FDI and exchange rate changes in terms of both the level and volatility (Takagi & Shi, 2011; Sharifi-Renani & Mirfatah, 2012; Nishiyama, 2017). Wint & Williams (2002) showed that a stable economy will attract more foreign direct investment. Thus a low inflation environment is desired in countries that promote foreign direct investment as a source of capital flow. This study examined the effect of macroeconomic variables on inflow of foreign direct investment in Nigeria and South Africa.

SECTION 2: REVIEW OF RELATED LITERATURE

Foreign Direct Investment

An agreed framework definition of foreign direct investment (FDI) exists in the literature. That is, FDI is an investment made to acquire a lasting management interest (normally 10% of voting stock) in a business enterprise operating in a country other than that of the investor defined according to residency (World Bank, 1996). Such investments may take the form of either “greenfield” investment (also called mortar and brick investment) or merger and acquisition (M&A), which entails the acquisition of existing interest rather than new investment (Udoh and Egwakhide, 2008).

In corporate governance, ownership of at least 10% of the ordinary shares or voting stock is the criterion for the existence of a direct investment relationship. Ownership of less than 10% is recorded as portfolio investment. FDI comprises not only merger and acquisition and new investment, but also reinvested earnings and loans and similar capital transfer between parent companies and their affiliates. Countries could be both host to FDI projects in their own country and a participant in investment projects in other counties. A country’s inward FDI position is made up of the hosted FDI projects, while outward FDI comprises those investment projects owned abroad (Odua, 2009).

Sub-Saharan Africa as a region now has to depend very much on FDI for so many reasons, some of which are amplified by (Ang, 2008). The preference for FDI stems from its acknowledged advantages. The effort by several African countries to improve their business climate stems from the desire to attract FDI. In fact, one of the pillars on which the New Partnership for Africa's Development (NEPAD) was launched was to increase available capital to US\$64 billion through a combination of reforms, resource mobilization and a conducive environment for Foreign Direct Investment (FDI).

Unfortunately, the efforts of most countries in Africa to attract FDI have been futile. This is in spite of the perceived and obvious need for FDI in the continent. The development is disturbing, sending very little hope of economic development and growth for these countries. Further, the pattern of the FDI that does exist is often skewed towards extractive industries, meaning that the differential rate of FDI inflow into sub-Saharan African countries has been adduced to be due to natural resources, although the size of the local market may also be a consideration, billion through a combination of reforms, resource mobilization and a conducive environment for Foreign Direct Investment (Alfaro, 2008).

Macroeconomic Variables and Foreign Direct Investment

Almost all of the factors explained under the limitations of inflow of FDI are as well the considering factors that serves as determinants for the inflow of FDI. When they are not put in place, they will certainly obstruct the FDI inflow and when they are well taken care of, they help facilitate the operation of FDI. The stability of macroeconomic variables such as; low level of inflation, little external debt, stable currency, better GDP rate will certainly stimulate the interest of the FDI inflow in any country. Greater macroeconomic stability reflects little investment risk, which tends to affect the expenses and revenues of the firm from foreign investment. Alkhasawneh, (2013) gives analysis on the causality relationship and its direction between the FDI inflows as a percentage of GDP and the economic development as measured by GDP per capita (GDP). The author discovers a solid and positive relationship that exists between GDP p.c. and FDI inflows. He also gives his conclusion that there is a bi-directional causality between FDI and GDP for one, two and three year lags.

Georgantopoulos and Tsamis, (2011) also investigate the relationship between GDP p.c. and FDI flows in Greece. Macroeconomic stability also gives an indication of the success of government policies in achieving economic equilibrium, and hence helps to create an environment that is conducive enough for FDI flows. Higher output volatility and inflation should serve as discouragement to FDI flows as they show instability in macroeconomic fundamentals. A lot of the studies in the literature consider only the inflation aspect of macroeconomic stability. While Faeth, (2009), find inflation to be negatively related to FDI, Mhlanga et al., (2010) for South African countries and Vijayakumar et al., (2010) for BRIC economies find inflation to be insignificant determinant of FDI. Kersan-Skabic, (2013) reflect the significance of economic determinants (GDP per capita and inflation) to FDI inflows, while among institutional factors, only corruption, large scale privatization, the development of trade and forex systems, and overall infrastructure reform have a significant impact on FDI inflows.

Kersan-Skabic, (2013) sees the following variables such as: GDP p.c., Wages, Inflation, Enterprise restructuring, Trade and forex system, Corruption, Property rights freedom, GDP,

Large privatization, Small privatization, Overall infrastructure reform. Clark and Kassimatis, (2009) find that default risk leads to FDI drops in Latin America. This is connected to the changing of leaders at regular and unusual interval, governmental policies, and security matters to government, and leadership type. The stability of political administration of a nation is of great import to the smooth operation of multinational companies. Security issue is also of topmost importance to them because unsuccessful attempt of government to guarantee foreign investors with high level of security will get them discouraged to run their operations without excessive risk of both their capital and labor force. Nigeria and Angola are examples of the countries with finer natural resources that could indeed attract the interest of the foreign investors but the issue of security in those countries and their leadership type is something to ponder about. Meon and Sekkat, (2012) analyze the effect of political risk on FDI. Jadhav, (2012) explores the impact of economic, institutional and political factors. As a dependent variable, he picks the FDI inflow.

A depreciation of the host country currency also increases the relative value of the wealth possessed by the firms in the host country which induces the MNCs to invest a greater amount in the form of FDI in the host country. This is because a depreciating currency of the host country decreases that country's wages and production cost relative to country whose currency is appreciating. So other things equal, a country that is experiencing real depreciation of its currency is more attractive for receiving investment in production by the foreign firms. Thus exchange rate depreciation increases the overall rate of return to foreign firms who want to invest in the country.

FDI flows are thus expected to rise when the host country currency is depreciating. Ang, (2008), finds evidence in favor of these arguments. Country risk is seen as one of the significant factors that foreign investors put into consideration while investing internationally. The host country should have adequate foreign exchange reserves which is a sign that it will not default or impose capital controls in the face of withdrawal of funds from the country. It indicates that the external position of the economy is good which raises the investor confidence. Hayakawa, Kimura and Lee (2011) found an insignificant impact of financial risk on FDI flows for a panel of 93 countries.

A market with a larger size of the host country tends to attract greater FDI flows because a larger market means that the cost of production (or cost per unit output) reduces as a result of economies of scale. Moreover, if the objective of the investor is to serve the host country, i.e. if FDI flows are horizontal market seeking in nature, then higher levels of economic activity would mean bigger income levels which imply greater consumer demand and hence profitable investment opportunities. Thus a larger market size of the host country tends to attract FDI.

However, if FDI flows are vertical in nature, and not market seeking, then they may not be driven by the size of the host country. Market size is one of the strong and resilient determinants of FDI in the empirical literature. Cleeve, (2008) find a positive interrelationship between FDI flows and GDP p.c. meaning that country with higher GDP has better investment opportunities and the FDI is market seeking in nature. Mohamed and Sidiropoulos, (2010) and Vijayakumar et al., (2010) also find a positive relation between host country GDP and FDI inflows. This also an indication that majority of the FDI flows are horizontal or market seeking in nature. Jadhav,

(2012) also adds the market size, which is represented by GDP, and natural resource availability, which is represented by the share of minerals and oil in total export.

Open economies of the developing countries are considered as a channel of success for FDI to penetrate in comparison to closed economy countries, which scarcely provides room for external intervention. There are lots of findings that suggested the fact open economy is a great determinant of FDI inflow. Hengel, (2010) opines that simultaneously opening trade and attempting to improve the investment climate helps to derive the highest levels of FDI. With the exception of price liberalization, the marginal effect of investment climate reforms raises when a country possesses a higher degree of trade openness.

Ho and Rashid, (2011) pinpoint that for countries that are growing and/or developing, degree of openness can have influence on FDI. A liberalized trade regime can serve as encouragement or discouragement for FDI. If FDI is export oriented then greater trade restrictions imply greater transaction costs in exporting to other countries and if FDI is vertical in nature then MNCs may adopt imported intermediate inputs. In both cases greater trade openness of the host country helps to attract FDI.

Moreover trade liberalization also leads to better and favorable business climate, expectation of better growth prospects and larger size of the host country in future. On the other hand, the relationship that exists between FDI and trade openness could be negative in case FDI flows are tariff jumping in nature. This is because higher tariffs or restrictive trade policies leading to lower trade openness provide incentives to the firms to have access to the local host country markets through FDI. The empirical evidence on trade openness and FDI is mixed, Cleeve, (2008) and Mhlanga, Blalock and Christy, (2010) find a positive impact of trade openness on FDI. Vijayakumar et al., (2010), find trade openness to be insignificant. Table 5 also explains major determinants of FDI and the studies carried out on it

Portia Bukari, (2011) opines that economic growth and development theories usually concentrate on the rise in real per capita income in connection with rise in main factors which includes capital accumulation, technological progress, population growth and the discovery of new and modern natural resources. However the motive behind quicker growth is capital accumulation. It is rational and logical to suggest that capital accumulation through FDI must have the capability of having influence on economic growth. FDI's must serve as good catalysts for economic growth and also serve as supplements to domestic firms rather than substitutes.

Ndikumana and Verick, (2008) propose that has notable positive effect on economic growth. The dynamism in international economic and political environment has brought about a revived interest in the gains FDI can proffer to developing countries in their attempt to achieve economic growth. Dauda, (2007) argues that FDI is usually considered to prompt economic growth in developing countries due to the fact that it makes notable contributions to the host country's development process particularly through allaying of the constraints of low levels of domestic savings and investment as well as foreign exchange deficits. He went further to argue that FDI enhances the GDP and generates a stream of real incomes in the host country. The increase in productivity benefits local income groups through higher wages and expanded job opportunities, reduction in the price of products paid by consumers, rent to local resource owners, and high

taxrevenue or royalties to the government. FDI is also identified by tremendous positive pillovers.

According to some economists FDI makes use of varying effects. For instance Oseghale and Amonkhienan, (2008) found that FDI is positively associated with GDP, concluding that greater inflow of FDI will spell a better economic performance for the country. When analyzing FDI from the short- term aspect, it is more profitable than long-term (AndeoluAjamoaler, 2007). Omagbeme, (2010) observed, there is a vast literature establishing the relationship between FDI and economic growth especially in developing countries, it implies an “array of investments made to acquire lasting interest in enterprises operating outside the economy of the investor”, that is FDI is a form of lending or finance in the area of equity participation, which involves the transfer of resources, including, capital, technology, management and marketing expertise.

Theoretical review

This portion indicates the theoretical underpinnings of the study. Specifically, the study reviews the product life cycle developed by Vernon (1996) and eclectic theory developed by Dunning (1993/2000), which explain the nature and the institution of FDI in the host country.

The Product Life Cycle Hypothesis

Vernon (1996) developed a theory of trade that attempted to explain the tendency for the production of new goods to be concentrated in the developed countries early in the life of the product, but to move to other economies later on. He also emphasized in his work that a firm tends to become multinational at a certain stage in its growth. He said in the early stages of product cycle, initial expansion into overseas markets is by means of exports. Because countries are at different stages of economic development, separated by “technology gap,” new markets are available to receive new products through the demonstration effect of richer countries. Prior to the standardization of the production process, the firm requires close contacts with both its product market and its suppliers.

However, once the product has evolved in a standard form and competing products have developed, the firm may decide to look overseas for the lower cost locations and new markets. Here, it is not that factor inputs may be less expensive abroad but that considered scale economies from longer production runs may be obtained through the allocation of component production and assembly to different plants. The product cycle hypothesis is useful on several counts. First, it offers an explanation of the concentration of innovations in developed countries, and an integrated theory of trade and FDI. This theory helps to explain our argument that FDI inflows to any country depends on adequacy of some factors. Thus, the theory intends to address the apparent inadequacy of the comparative advantage framework in explaining trade and foreign investment and to concentrate on the issues of timing of innovation, effects of economies of scale and, to a lesser extent, the role of uncertainty. Product life cycle theory also seeks to explain how a company will begin by exporting its products and eventually undertake FDI as the product moves through its life cycle. Put differently, the theory indicates that a country’s export eventually becomes its import and there are three stages in the life of a product, which are new product stage, maturing product stage and standardized product stage. With this, FDI occurs in the latter two stages (i.e. maturing product stage and standardized product stage).

Eclectic theory

This theory of FDI is suggested by Dunning (1993/2000) and it is often referred to as the OLI paradigm. The O, L, and I in the paradigm refer to three groups of conditions that determine whether a firm, industry or company will be a source or a host of FDI. These groups are ownership advantages, locational considerations and internalization gains. Ownership advantages are those advantages that are specific to the firm. The firm enjoys such advantages over domestic as well as foreign competitors, so that expansion in the domestic market may be an alternative strategy. Such advantages include advantages in technology and in management and organizational skills, size and diversification, access to or control over raw materials, the ability to call on the political support of their government, access to finance on favorable terms, perhaps in foreign as well as domestic markets and the ease with which the firm can shift production between two countries.

Locational considerations encompass such things as transport costs facing both finished products and raw materials, import restrictions, the ease with which the firm can operate in another country, the profitability with which the ownership advantages may be combined with factor endowments in other countries, the tax policies in both source and host countries, and political stability in the host country.

Internalization gains concerns those factors which make it more profitable to carry out transactions within the firm than to rely on external markets. It is to be noted that such gains result from avoiding market imperfections (uncertainty, economies of scale, problem of control, the undesirability of providing full information to a prospective purchaser and so on). However, the existence of internalization gains obviously depends to some extent on the existence of ownership advantages. The essential element in the eclectic theory of FDI is that all the three types of conditions must be met before there will be FDI.

However, the eclectic theory provides no clear indication as to the relationship between trade and FDI flows. Ownership advantages, by themselves, imply less trade. If the firm invests due to ownership advantages, it is in place of exporting. Internalization, as already discussed, may lead to increased trade flows as different divisions import and export to other divisions along the verticalized process line. Location often implies a negative relationship. If FDI is chosen due to locational advantages, it would imply a decrease in trade. This is because exports are replaced by closer production in the host country market. Locational advantages relating to natural resources, however, imply an increase in trade as FDI extracts those resources for home country use. Yet, again, location seen in a regional context may lead to enhanced trade as the host country is used as a base through which the multinational corporations serve the entire region.

In a nutshell, the main idea of eclectic paradigm is that in order to invest abroad, a firm ought to have important advantages in terms of ownership, location and internalization. Ownership-specific advantages could be competitive in nature and firms could enjoy monopoly power, possession of a bundle of scarce, unique and sustainable resources and capabilities, which essentially reflect the superior technical efficiency of a particular firm relative to those of its competitors (Dunning, 2000). Location-specific advantages are the “immobile, natural or created endowments” which become an incentive to invest in a particular country. The internalization advantage gives international investors incentives to engage in foreign investment activities

rather than franchising or licensing. The positive spillovers of FDI to host nations and their economies according to the theory can come in the form of an increase in national income, savings, financial resources (significant means of funding), higher employment rate, new technology and managerial know-how, improvements in human resources, increases in competition and economic development (Chowdhury and Mavrotas, 2006; Moghaddam and Redzuan, 2012). This theory helps to explain our assertion that foreign investors will be interested in extending FDI if these initial conditions are in place which every developing country needs.

Empirical Review

Sultana (2016) empirically examined the impact of macroeconomic variables on FDI inflows in India, utilizing time-series data between 1981 and 2014. The finding from the empirical study reveals that interest rate and inflation have a negative relationship with FDI inflows, while exchange rate, exports, imports, and economic growth exert positive impact on FDI inflows. Additionally, the Granger causality test revealed a one-way causality running from imports, economic to FDI inflows in India, while feedback causality was found between exports and FDI inflows

Musyoka and Ocharo (2018) explored the impact of inflation, competitiveness exchange rates, and interest rate on FDI inflows using yearly data from 1970 to 2016. The investigators used the OLS technique and findings demonstrate that FDI inflows is impacted negatively exchange rate and interest rate, while insignificant relationship exists between inflation and FDI inflows in Kenya. Bosire (2018) conducted a research on determinants of FDI inflows in 12 eastern Africa economies. The investigator used panel data spanning between 2004 and 2016 and GLS estimation method. The findings revealed that exchange rate and economic growth exert positive impact on FDI inflows, while interest rate exerts negative impact on foreign direct investments. In Ghana, using OLS and Granger causality techniques, Asiamah et al. (2020) examined determinants of FDI inflows by utilizing time-series data between 1985 and 2015. The outcome of the OLS regression shows that changes in FDI inflows can be predicted by government expenditure, infrastructure, and external debt, while the Granger causality test revealed a one-way causality running from the interest rate, government expenditure, inflation, to FDI inflows.

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inflows, while adverse link was found between the interest rate and FDI inflows. Furthermore, an insignificant link was found between the interest rate and FDI inflows

Chanegriha *et al.* (2020) investigated the causal relationship between FDI inflows and economic growth using 136 developed and emerging countries. The authors utilized Granger causality test and their findings show that in Estonia, Guyana, Poland, Switzerland, Tajikistan, and Yemen, FDI inflows cause economic growth. In contrast, in the Dominican Republic, Gabon, Madagascar, and Poland's economic growth cause FDI inflows. Kueh and Soo (2020) examined the link between FDI inflows, market size, exchange rate, labor force, and inflation using yearly data spanning between 2000 and 2016 in Cambodia, Laos, Myanmar, and Vietnam. The relationship was examined by utilizing cointegration, FMOLS, and panel Granger causality. The empirical findings show that cointegration exists among the variables employed in the long run. Also, a one-way causality was found running from inflation and exchange rate to FDI inflows. Employing time-series data between 1975 and 2017, Borhan and Subramaniam (2020) explored the interactions between FDI inflows, market size, inflation economic growth, exchange rate, and trade openness in India. The short- and long-run dynamics between FDI inflows and the other macroeconomic variables was investigated by utilizing the ARDL techniques. The bound test reveals cointegration among the variables in the long run. Furthermore, there is a positive link between FDI inflows and economic growth, even though the interest rate and inflation impact FDI inflows negatively. Additionally, no interaction was found between FDI inflows and the other macroeconomic variables in the short run.

Islam and Sahajalal (2019) utilized yearly data between 1976 and 2018 to explore the dynamics between FDI inflows and some selected macroeconomic variables in Bangladesh. The authors employed OLS and Johansen Cointegration tests to verify these dynamics. The findings indicate cointegration among FDI inflows and the selected indicators in the long run. Furthermore, economic growth and inflation exerts positive impact on FDI inflows, while a negative relationship was found between interest rate and FDI inflows in Bangladesh. Using multiple regression techniques and time-series data ranging from 1990 to 2015, Khan and Rehman (2019) investigated the impact of unemployment, average tax rate, and inflation on FDI inflows in Pakistan. The authors found an insignificant relationship between FDI and inflation, while unemployment has positive and significant interaction with FDI inflows; However, no relationship was found between FDI inflows and average tax return. Awad (2020) examined the relationship between FDI inflows and selected macroeconomic variables in Malaysia. The author used ARDL and VECM to analyze this interaction utilizing data covering between 1970 and 2017. The findings revealed that FDI inflows are impacted negatively by the exchange rate, labor cost, and trade openness in the long run

Olukayode (2015) examined macroeconomic consequences of FDI in Nigeria between the period 1980-2012. Variables considered in the study were GDP, deregulation, political regime, trade openness inflation rate, exchange rate and infrastructural development of host country. Using the e-views econometric analysis, it was found that market size proxied with GDP, trade openness and infrastructure development attracts FDI significantly. Political instability was found to have negative but insignificant effect towards attracting FDI. It was also noted that exchange rate and inflation rate are positive but insignificant in the attraction of FDI. Obidike and Uma (2013)

study covered the period 1975 – 2009. They used the OLS e-view econometric analysis involving Augmented Dickey Fuller and Johansen Cointegration test. In the study it was found that the explanatory variables included in the model came out statistically significant on FDI in Nigeria. Variables considered therein were GDP, inflation rate, exchange rates, foreign exchange reserve, government total expenditure, current account balances and share of total trade in GDP and government fiscal discipline. Oladipo (2013) in a study using the Generalized Methods of Moments (GMM) with a time frame of 1985-2010 found that exchange rate, inflation rate, money supply and trade openness are important in the attraction and determination of FDI in Nigeria. However, previous FDI, and government recurrent expenditure negatively determine FDI. The effect of money supply on FDI is stronger than that of other variables.

SECTION 3: METHODOLOGY

The study adopted the quasi-experimental research design to examine the relationship macroeconomic variables and foreign direct investment in Nigeria and South Africa. This study utilized secondary data collected from the Central Bank of Nigeria and World Bank data base.

Model Specification

Following the previous works of Olukayode (2015), the study modeled the relationship between macroeconomic variable and foreign direct investment in Nigeria and South Africa as follows

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

$$NFDI / GDP = \alpha + \beta_1 RGDP + \beta_2 MS + \beta_3 RIR + EXR + \beta_5 IFR + e_i \quad 2$$

Where;

NFDI/GDP = Net foreign direct investment to gross domestic product

RGDP = Real Gross domestic product

MS = Money supply to GDP

RIR = Real interest rate

EXR = Exchange rate

IFR = Inflation rate

$\phi_0 \alpha_0 =$ Constant

$\beta_1 - \beta_5 =$ Coefficients of independent variables

$\mu_i =$ Error Term

Data Analysis Techniques

Econometric Analysis

Ordinary least squares (OLS) are a method for estimating the unknown parameters in a linear regression model. Hutcheson (2011) defined ordinary least square (OLS) regression as a generalized linear modeling technique that may be used to model a single response variable which has been recorded on at least an interval scale.

Unit Root Test

A unit root test is a statistical test for the proposition that in a autoregressive statistical model of a time series, the autoregressive parameter is one. The Augmented Dickey Fuller (ADF) unit root test is used to test the stationarity property of a time series data in order to avoid the spurious regression problem. The ADF unit root test is specified as

$$\Delta Y_t = \alpha + \beta Y_{t-1} + \sum_{j=1}^n \gamma_j \Delta Y_{t-j} + \varepsilon_t \quad 3$$

$$\Delta Y_t = \alpha + \beta Y_{t-1} + \sum_{j=1}^n \gamma_j \Delta Y_{t-j} + \varepsilon_t \quad 4$$

$$\Delta Y_t = \alpha + \beta Y_{t-1} + \sum_{j=1}^n \gamma_j \Delta Y_{t-j} + \varepsilon_t \quad 5$$

Note: The null hypothesis is rejected on the ground that the absolute value of the calculated ADF test statistic is larger than the absolute value of the Mackinnon critical value.

Cointegration Test

Cointegration is a statistical property of time series variables. There are two common methods for testing cointegration and estimating the relationship among cointegrated variables namely the Engle-Granger (1987) Two Step Procedure and Johansen's (1988) maximum likelihood method. In the Engle-Granger two-step procedure, variables entering the cointegrating vector are tested for integration of the order, I(1). The cointegration test is based on the following equation.

$$\text{[Illegible Equation]} \quad 6$$

Where n and n are 4×4 matrices and k is the lag length. The tests used here involved cointegration with linear deterministic trend in the vector auto regression (VAR).

Granger Causality Test

The main objective of this study is to investigate the causality between the independent and the dependent variables. Granger (1996) proposed the concept of causality and exogeneity: a variable Y_t is said to cause X_t , if the predicted value of X_t is ameliorated when information related to Y_t is incorporated in the analysis. The test is based on the following equation below

$$Y_t = \alpha + \beta Y_{t-1} + \sum_{j=1}^n \gamma_j \Delta Y_{t-j} + \mu_{1t} \quad 7$$

and

$$X_t = \alpha + \beta X_{t-1} + \sum_{j=1}^n \gamma_j \Delta X_{t-j} + \mu_{2t} \quad 8$$

Where X_t and Y_t are the variables to be tested while μ_{1t} and μ_{2t} are white noise disturbance terms and n is maximum number of lags. The null hypothesis $\alpha = \beta = 0$ for all 1's is tested against the alternative hypothesis $\alpha \neq 0$ and $\beta \neq 0$, if the coefficient of α_1 are statistically

significant, that of β_1 are not, then X causes Y, If the reversal is true than Y causes X. However, where both coefficient of α_1 and β_1 are significant then causality is bi-directional.

SECTION 4: RESULTS AND DISCUSSION OF FINDINGS

Table 1: Testing for Unit Root (Stationarity Test)

Variable	ADF Statistics	MacKinnon @ 1%	MacKinnon @ 5%	MacKinnon @ 10%	Prob.	Order of Integration	Decision	Remark
ADF at Level: Nigeria Data								
NFDI_GDP	-3.831144	-3.653730	-2.957110	-2.617434	0.1324	1(0)	Not Sig	Accept H0
MS	0.658098	-3.653730	-2.957110	-2.617434	0.8432	1(0)	Not Sig	Accept H0
IFR	1.321533	-3.661661	-2.960411	-2.619160	0.2224	1(0)	Not Sig	Accept H0
EXR	0.914235	-3.653730	-2.957110	-2.617434	0.9944	1(0)	Not Sig	Accept H0
RGDP	1.148783	-3.653730	-2.957110	-2.617434	0.1329	1(0)	Not Sig	Accept H0
RIR	2.024442	-3.679322	-2.967767	-2.622989	0.2753	1(0)	Not Sig	Accept H0
ADF at First Difference: Nigeria Data								
NFDI_GDP	4.504098	-3.711457	-2.981038	-2.629906	0.0015	1(1)	Sig	Reject HO
MS	8.322692	-3.670170	-2.963972	-2.621007	0.0000	1(1)	Sig	Reject HO
IFR	6.200429	-3.711457	-2.981038	-2.629906	0.0000	1(1)	Sig	Reject HO
EXR	7.096955	-3.670170	-2.963972	-2.621007	0.0000	1(1)	Sig	Reject HO
RGDP	4.590748	-3.699871	-2.976263	-2.627420	0.0011	1(1)	Sig	Reject HO
RIR	4.411530	-3.711457	-2.981038	-2.629906	0.0019	1(1)	Sig	Reject HO
NFDI_GDP	1.568058	-3.653730	-2.957110	-2.617434	0.2749	1(1)	Sig	Reject HO
ADF at Level: SOUTH Africa Data								
MS	0.863867	-3.661661	-2.960411	2.619160	0.7861	1(0)	Not Sig	Accept H0
IFR	1.991112	-3.661661	-2.960411	-2.619160	0.2890	1(0)	Not Sig	Accept H0
EXR	0.490407	-3.653730	-2.957110	2.617434	0.8805	1(0)	Not Sig	Accept H0
RGDP	2.575073	-3.670170	-2.963972	-2.621007	0.1091	1(0)	Not Sig	Accept H0
RIR	-	-3.653730	-2.957110	-2.617434	0.0603	1(0)	Not Sig	Accept

	2.868243							H0
ADF at First Difference: SOUTH Africa Data								
NFDI_GDP	-	-3.724070	-2.986225	-2.632604	0.0005	1(1)	Sig	Reject HO
	4.997046							HO
MS	-	-3.670170	-2.963972	-2.621007	0.0000	1(1)	Sig	Reject HO
	6.725418							HO
IFR	-	-3.699871	-2.976263	-2.627420	0.0000	1(1)	Sig	Reject HO
	7.110966							HO
EXR	-	3.679322	-2.967767	-2.622989	0.0000	1(1)	Sig	Reject HO
	7.379801							HO
RGDP	-	-3.737853	-2.991878	-2.635542	0.0000	1(1)	Sig	Reject HO
	5.997466							HO
RIR	-	-3.699871	-2.976263	-2.627420	0.0004	1(1)	Sig	Reject HO
	5.048230							HO

Source: Computed from E-View 9.0

Stationarity test or unit root test is one of the conditions to be satisfied in time series data analysis to ensure accuracy and to avoid spurious regression. A time series is said to be stationary when its mean and variance do not vary systematically over time (Gujarati 2004). A Unit root test was carried out to check for stationarity. In order to avoid problems of autocorrelation as may arise from using Dickey-Fuller test, the researcher used Augmented Dickey-Fuller Unit root test.

The Null hypothesis is that, Unit root is present in the variable under test. Alternative hypothesis is that there is No unit root. The critical value at 5 percent is the base for guideline on unit root test. When the absolute value (not considering the sign) of the Test statistics is higher than the absolute value (ignoring the sign) of the critical value at 5 percent, we reject null hypothesis, we instead accept alternative hypothesis that there is no unit root. The results performed using E-view version 9.0, as shown above. The first Unit root test conducted was Augmented Dickey-Fuller Test at Level for each variable. And the results as shown in the table above indicate that the variables are stationary, because all the absolute values of the Test statistics, regardless of their signs were above than the values of the 5% critical value. Therefore, the variables are stationary at first difference. We reject the null hypothesis of non stationarity and conclude that there is stationarity at first difference and integrated in the order of 1(I).

Table 2: Johansen Co-Integration Test Results: Trace

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
Macroeconomic Variables and Foreign Direct Investment in Nigeria				
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	61.69768	47.85613	0.0074
At most 3*	0.302071	36.50982	29.79707	0.04759
At most 4	0.158724	5.361061	15.49471	0.7693
At most 5	0.000102	0.003151	3.841466	0.9535
Macroeconomic Variables and Foreign Direct Investment in South Africa				
None *	0.879208	129.9121	95.75366	0.0000

At most 1 *	0.690896	70.72896	69.81889	0.0422
At most 2*	0.533858	57.85479	47.85613	0.0084
At most 3	0.345798	16.48339	29.79707	0.6779
At most 4	0.147605	4.601876	15.49471	0.8495
At most 5	0.004637	0.130144	3.841466	0.7183

Source: Computed from E-View 9.0

From the lag selection criteria, the most appropriate lag was lag 2 due to inadequate number of observations. Two equations were used, but with similar model. This was so to avoid the problem of multicollinearity of variables. The two dimensions were put in a separate equation. In all the two hypotheses, the Trace statistics indicate that the variables are cointegrated. The Maximum Eigen value shows cointegration. Null Hypothesis: There is no cointegration among variables (Hypothesis zero) Alternative hypothesis

The guideline is that when the Trace statistics is more than 5 % percent Critical value, we reject the null hypothesis. In all the three equations, we see that the trace statistics are higher than the critical values at 5 percent; we can then reject the null hypothesis, because variables are cointegrated. Trace test indicates 2 cointegrating equations at the 0.05 level, from the results, we conclude the presence of long run relationship between the independent variables and the dependent variable.

Table 3: Parsimonious Error Correction Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Macroeconomic Variables and Foreign Direct Investment in Nigeria				
C	0.005800	0.228731	0.025358	0.9800
D(NFDI_GDP(-1))	0.178477	0.200860	0.888566	0.3834
D(MS(-1))	0.108618	0.122666	0.885473	0.3851
D(IFR(-1))	0.027918	0.017068	1.635654	0.0155
D(EXR(-1))	-0.003812	0.010678	-4.357010	0.0000
D(RGDP(-1))	0.039038	0.060960	0.640389	0.5282
D(RIR(-1))	0.009874	0.024138	0.409065	0.6863
ECM(-1)	-0.990554	0.271234	-3.652030	0.0013
R-squared	0.580612	Mean dependent var		-0.006097
Adjusted R-squared	0.452972	S.D. dependent var		1.484247
S.E. of regression	1.097769	Akaike info criterion		3.242074
Sum squared resid	27.71725	Schwarz criterion		3.612135
Log likelihood	-42.25214	Hannan-Quinn criter.		3.362704
F-statistic	4.548822	Durbin-Watson stat		1.722132
Prob(F-statistic)	0.002603			
Macroeconomic Variables and Foreign Direct Investment in South Africa				
C	0.085256	0.239337	0.356218	0.7252
D(NFDI_GDP(-1))	0.253867	0.192422	1.919321	0.0013
D(MS(-1))	-0.036994	0.082981	-0.445819	0.6603
D(IFR(-1))	-0.014861	0.103370	-0.143761	0.8871
D(EXR(-1))	0.086736	0.181423	0.478084	0.6375
D(RGDP(-1))	0.669200	0.136972	2.505217	0.0011

D(RIR(-1))	-0.137492	0.110511	-1.244150	0.2272
ECM(-1)	-1.405086	0.296789	-4.734298	0.0001
R-squared	0.650891	Mean dependent var		0.045207
Adjusted R-squared	0.534521	S.D. dependent var		1.713764
S.E. of regression	1.169233	Akaike info criterion		3.379524
Sum squared resid	28.70923	Schwarz criterion		3.756709
Log likelihood	-41.00310	Hannan-Quinn criter.		3.497654
F-statistic	5.593295	Durbin-Watson stat		1.460796
Prob(F-statistic)	0.000961			

Source: Computed from E-View 9.0

From the table, in the two hypotheses the Error correction term is negative and significant which confirm to expectation, that is to say it has a negative sign, implying that the error obtain has high possibilities of moving much further away from the equilibrium path as time goes on and on. The ECM (-1) coefficient shows that the variables could adjust to equilibrium by 99.0 percent annually for Nigeria and 13.7 percent annually for South Africa. This means that the variables have higher speed for Nigeria than South Africa. The adjusted R² shows that the independent variables can explain 45.2 percent in foreign direct investment while the variables explained 53.4 percent of foreign direct investment to South Africa. The findings imply that the variables have higher explained variation in South Africa than Nigeria.

Table 4: VAR Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
Macroeconomic Variables and Foreign Direct Investment in Nigeria						
1	-515.4253	NA	1.17e+08*	35.57583*	37.24110*	36.11867*
2	-465.9153	60.68972	61365291	34.70421	38.03476	35.78989
Macroeconomic Variables and Foreign Direct Investment in South Africa						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-392.5960	NA	93345.81*	28.47115*	28.75662*	28.55842*
1	-271.9566	180.9592	235.8414	22.42547	24.42377	23.03637
2	-235.5680	38.98775	341.0924	22.39771	26.10885	23.53225

Source: Computed from E-View 9.0

The major findings in the current simulation study are previewed as follows. First, these criteria managed to pick up the correct lag length at least half of the time in small sample. Second, this performance increases substantially as sample size grows. Third, with relatively large sample (31 year), HQC is found to outdo the rest in correctly identifying the true lag length. In contrast, AIC and FPE should be a better choice for smaller sample. Fourth, AIC and FPE are found to produce the least probability of under estimation among all criteria under study. Finally, the problem of over estimation, however, is negligible in all cases. From the results, the study adopt lag 1 for analysis.

Table 5: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
Macroeconomic Variables and Foreign Direct Investment in Nigeria			
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
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
Macroeconomic Variables and Foreign Direct Investment in South Africa			
MS does not Granger Cause NFDI_GDP	31	0.61076	0.5505
NFDI_GDP does not Granger Cause MS		0.19918	0.8206
IFR does not Granger Cause NFDI_GDP	31	3.41526	0.0482
NFDI_GDP does not Granger Cause IFR		3.54649	0.0435
EXR does not Granger Cause NFDI_GDP	31	0.60265	0.5548
NFDI_GDP does not Granger Cause EXR		1.53143	0.2351
RGDP does not Granger Cause NFDI_GDP	28	2.28706	0.1242
NFDI_GDP does not Granger Cause RGDP		0.23998	0.7886
RIR does not Granger Cause NFDI_GDP	31	2.44393	0.1065
NFDI_GDP does not Granger Cause RIR		0.28588	0.7537

Source: Computed from E-View 9.0

The cointegration results alone are not adequate enough to explain the relationship between macroeconomic variables and foreign direct investment. We need to establish the direction of this relationship, hence the causality test. Given that a relationship exists between macroeconomic variables and foreign direct investment as shown from the Johansen cointegration test from the trace statistics, we ought to examine the causation of this relationship. Macroeconomic variables and foreign direct investment can predict itself. The study found bidirectional causality from inflation rate to foreign direct investment and from foreign direct investment to inflation rate in South Africa while there is no causal relationship among the variables in Nigeria.

Discussion of Findings

From the results presented in table 3, the study found that money supply, inflation rate, gross domestic products and real interest rate have positive relationship with foreign direct investment inflow into Nigeria economy while exchange rate have negative effect on foreign direct investment inflow to Nigeria economy. The positive effect of the variables confirms the a-priori expectation of the study. The study found that money supply, real interest rate and inflation rate have negative effect on foreign direct investment to South Africa while gross domestic product and exchange rate have positive effect on foreign direct investment to South Africa. Empirically the findings of the study is in line with the findings of Sultana (2016) that interest rate and inflation have a negative relationship with FDI inflows, while exchange rate, exports, imports, and economic growth exert positive impact on FDI inflows, the findings of Musyoka and

Ocharo (2018) that exchange rate and economic growth exert positive impact on FDI inflows, while interest rate exerts negative impact on foreign direct investments. In Ghana, using OLS and Granger causality techniques and the findings of Asiamah et al. (2020) that changes in FDI inflows can be predicted by government expenditure, infrastructure, and external debt, while the Granger causality test revealed a one-way causality running from the interest rate, government expenditure, inflation, to FDI inflows.

SECTION 5: CONCLUSION AND RECOMMENDATIONS

Conclusion

The paper examined the macroeconomic variables that determine of foreign direct investment inflows into Nigeria and South Africa. The main objective of this study was to find out the major macroeconomic variables that determine of foreign direct investment in Nigeria and South Africa between the periods 1987 to 2019. All the variables are integrated with order one that is $I(1)$. With the optimal lag length of two, the cointegration test showed that the variables were two cointegrated. From the findings, the study conclude that exchange rate have significant relationship inflow of foreign direct investment in Nigeria and no significant relationship inflow of foreign direct investment in South Africa. Money supply has no significant relationship inflow of foreign direct investment in Nigeria and no significant relationship inflow of foreign direct investment in South Africa. Gross domestic product have no significant relationship inflow of foreign direct investment in Nigeria but have significant relationship inflow of foreign direct investment in South Africa. inflation rate have significant relationship inflow of foreign direct investment in Nigeria but have no significant relationship inflow of foreign direct investment in South Africa, real interest rate have no significant relationship inflow of foreign direct investment in Nigeria and that real interest rate have no significant relationship inflow of foreign direct investment in South Africa.

Recommendations

1. Policies of the government to ensure price stability and macroeconomic stability are required to attract foreign direct investment into the country. Also, government should formulate sound foreign exchange rate policy that will attract foreign direct investment through exchange rate stability.
2. There is need for government to see to the improvement of the business environment to so as to enable FDI in contributing positively to economic growth. One of the ways of improving the business environment is by making provision of needful and essential infrastructure, which will help to lower the cost of running an establishment in Nigeria and South Africa.

REFERENCES

- Adebayo, E.O., Gambiyo, S. P. (2020) .Economic analysis of the determinants of foreign direct investment (FDI) in Nigeria. *Arch Bus Res* 8(1):74–81
- Adebayo, T.S. & BetonKalmaz, D. (2020). Ongoing debate between foreign aid and economic growth in Nigeria: A wavelet analysis. *SocSci Quart* 6(2):37–44
- Adebayo, T.S. (2020a). Dynamic relationship between oil price and inflation in oil exporting economy: empirical evidence from wavelet coherence technique. *Energy Econ Let*, 7(1)12-22.
- Adebayo, T.S. (2020b). New insights into export-growth Nexus: wavelet and causality approaches. *Asian J Econ Bus Account* 15:32–44
- Almfraji, M. A., & Almsafir, M. K. (2014). Foreign Direct Investment and Economic Growth Literature Review from 1994 to 2012. *Procedia Social and Behavioral Sciences*, 129, 206-213.
- Alola, A. A. & Kirikkaleli, D. (2019). The nexus of environmental quality with renewable consumption, immigration, and healthcare in the US: wavelet and gradual-shift causality approaches. *Environ SciPollut Res* 26(34):35208–35217
- Alshamsi, K. H., bin Hussin, M. R., & Azam, M. (2015). The Impact of Inflation and GDP per Capita on Foreign Direct Investment: The Case of United Arab Emirates. *Investment management and Financial Innovations*, 12(3), 132-141.
- Alvarago, R., Iñiguez, M., & Ponce, P. (2017). Foreign Direct Investment and Economic Growth in Latin America. *Economic Analysis and Policy*, 56, 176-187. <https://doi.org/10.1016/j.eap.2017.09.006>.
- Amoah, E., Nyarko, E., & Asare, K. (2015). FDI, Inflation, Exchange Rate and Growth in Ghana: Evidence from Causality and Co-integrated Analysis. *European Scientific Journal*, 11(31), 294-304.
- Asiamah, M, Ofori, D. & Afful, J. (2020). Analysis of the determinants of foreign direct investment in Ghana. *J Asian Bus Econ Stud* 26(01):56–75
- Awad, A. (2020). Foreign direct investment inflows to Malaysia: do macroeconomic policies matter? *J Intern Stud* 13(1):196–211
- Bağcı, E., & Ergüven, E. (2016). Relations Between Interest Rate, Inflation, Growth, and Investment in Turkey, 2002-2015. *ISOR Journal of Economics and Finance*, 7(5), 43-49.
- Bibi, S., Ahmad, S. T., & Rashid, H. (2014). Impact of Trade Openness, FDI, Exchange Rate, and Inflation on Economic Growth: A Case Study of Pakistan. *International Journal of Accounting and Financial Reporting*, 4(2), 236-257.
- Boateng, A., Hua, X., Nisar, S. & Wu, J. (2015). Examining the determinants of inward FDI: evidence from Norway. *Econ Model* 47:118–127
- Bobenič, H. A., Bruothová, M., Kubíková, Z. & Ručinský, R. (2018). Determinants of foreign direct investment inflows: a case of the Visegrad countries. *J Intern Stud* 11(2):56–69
- Borhan, H. B. & Subramaniam, G. (2020). Impact of international trade on economic growth in a developing nation a case study of Malaysia. *SMART J Bus Manage Stud* 16(1):90–98

- Bosire, E. M. (2018). Macro-economic factors and foreign direct investment flows into eastern Africa region. *Intern J Econ Financ Issues* 8(5):200–209
- Cambazoğlu, B., & Sevcan, G. (2016). The Relationship between Foreign Exchange Rate and Foreign Direct Investment in Turkey. *Economics, Management, and Financial Markets*, 11(1), 284–293.
- Carbonell, J. B., & Werner, R. A. (2018). Does Foreign Direct Investment Generate Economic Growth? A New Empirical Approach Applied to Spain. *Economic Geography*, 94(4), 425–456.
- Chanegriha, M. Stewart, C. & Tsoukis, C. (2020). Testing for causality between FDI and economic growth using heterogeneous panel data. *J Intern Trade Econ Dev* 29:546–565
- Dorantes, A., & Pozo, S. (2001). Foreign Exchange Rate and Foreign Direct Investments in the United States. *The International Trade Journal*, 15(3), 323–343.
- Dunning, J. H. (1988). The Eclectic Paradigm of International Production: A Restatement and Some Possible Extensions. *Journal of International Business Studies*, 19(1), 1–31.
- Encinas-Ferrer, C., & Villegas-Zermeño, E. (2015). Foreign Direct Investment and Gross Domestic Product Growth. *Procedia Economics and Finance*, 24, 198–207.
- Feeny, S., Lamsiraroj, S., & McGillivray, M. (2014). Growth and Foreign Direct Investment in the Pacific Island Countries. *Economic Modelling*, 37, 332–339.
- Ghazali, A. (2010). Analyzing the relationship between Foreign Direct Investment, Domestic Investment and Economic Growth for Pakistan. *International Research Journal of Finance and Economics*, 47, 124–131.
- Gokmenoglu, K., Kirikkaleli, D. & Eren, B. M. (2019). Time and frequency domain causality testing: the causal linkage between FDI and economic risk for the case of Turkey. *J Intern Trade Econ Dev* 28(6):649–667
- Goupillaud, P., Grossmann, A. & Morlet, J. (1984). Cycle-octave and related transforms in seismic signal analysis. *Geoexploration* 23(1):85–102
- Islam, M. S. & Sahajalal, M. (2019). An empirical analysis of macroeconomic indicators as determinants of foreign direct investment (FDI) in Bangladesh 1976–2018. *Int. J Sci Res Multidiscip Stud* 5:12
- Kalmaz, D. B. & Kirikkaleli, D. (2019). Modeling CO₂ emissions in an emerging market: empirical finding from ARDL-based bounds and wavelet coherence approaches. *Environ Sci Pollut Res* 26(5):5210–5220
- Khan, A. & Rehman, N. U. (2019) Impact of macroeconomic variables on foreign direct investment in Pakistan: time series analysis for the period (1990–2015). *J Soc Sci Humanit* 2(1 & 2):32–46
- Kiyota, K., & Urata, S. (2004). Exchange Rate, Exchange Rate Volatility and Foreign Direct Investment. *The World Economy*, 27(10), 1501–1536. <https://doi.org/10.1111/j.1467-9701.2004.00664.x>.
- Kosteletou, N., & Liargovas, P. (2000). Foreign Direct Investment and Real Exchange Rate Interlinkages. *Open Economic Review*, 11(2), 135–148. <https://doi.org/10.1023/A:1008383821669>.

- Kueh, J., & Yong, S. W. (2018). FDI Led Growth in Malaysia: Autoregressive Distributed Lag (ARDL) Bounds Testing Approach. *International Business Research*, 11(11),46-54.
- Kueh, J., Soo, X. L. (2020). Macroeconomic determinants of FDI inflows in Cambodia, Laos, Myanmar and Vietnam: panel data analysis. *Thail World Econ* 38(1):54–72
- Kumari, R. & Sharma, A. K. (2017) Determinants of foreign direct investment in developing countries: a panel data study. *Intern J Emerg Mark* 5(3):67–81
- Lamsiraroj, S. (2016).The Foreign Direct Investment-Economic Growth Nexus.*International Review of Economics and Finance*, 42, 116-133.
- Lamsiraroj, S., &Ulubasoglu, M. A. (2015). Foreign Direct Investment and Economic Growth: A Real Relationship or Wishful Thinking. *Economic Modelling*, 51, 200-213.
- Li, C., & Tanna, S. (2019). The Impact of Foreign Direct Investment on Productivity: New Evidence for Developing Countries. *Economic Modelling*, 80, 453-466. <https://doi.org/10.1016/j.econmod.2018.11.028.202> 203
- Li, X., & Liu, X. (2005). Foreign Direct Investment and Economic Growth: An Increasingly Endogenous Relationship. *World Development*, 33(3), 393-407.
- MacDermott, R. (2008). Linking Exchange Rates to Foreign Direct Investment.*The International Trade Journal*, 22(1), 3-16. <https://doi.org/10.1080/08853900701784045>.
- Magnier-Watanabe, R., & Lemaire, J-P. (2018). Inbound Foreign Direct Investment in Japan: A Typology. *International Business Review*, 27(2), 431-442.
- Makiela, K., & Ouattara, B. (2018). Foreign Direct Investment and Economic Growth: Exploring the Transmission Channels. *Economic Modelling*, 72, 296-305. <https://doi.org/10.1016/j.econmod.2018.02.007>.
- Mason, R. L., &Vracheva, V. (2017).The Impact of Inflation Targeting on Attracting Foreign Direct Investment. *Journal of Applied Business and Economics*, 19(4), 79-94.
- Neto, D. G., &Veiga, F. J. (2013). Financial Globalization, Convergence and Growth: The Role of Foreign Direct Investment. *Journal of International Money and Finance*, 37, 161-186.
- Nishiyama, H. (2017). The Effect of Exchange Rate Fluctuations on Intra-Industry Reallocation in a Firm Heterogeneity Model with Trade and Foreign Direct Investment.*The Quarterly Review of Economics and Finance*, 64, 32-43.
- Omankhanlen, A. E. (2011). The Effect of Exchange Rate and Inflation on Foreign Direct Investment and its relationship with Economic Growth in Nigeria.*Economics and Applied Information*, 1, 5-16.
- Phillips, S., &Ahmadi-Esfahani, F. Z. (2008). Exchange Rates and Foreign Direct Investment: Theoretical Models and Empirical Evidence. *Australian Journal of Agricultural and Resource Economics*, 52(4), 505-525.
- Sayek, S. (2009).Foreign Direct Investment and Inflation.*Southern Economic Journal*, 76(2), 419-443.
- Sharifi-Renani, H., &Mirfatah, M. (2012).The Impact of Exchange Rate Volatility on Foreign Direct Investment in Iran. *Procedia Economics and Finance*, 1, 363-373. [https://doi.org/10.1016/S2212-5671\(12\)00042-1](https://doi.org/10.1016/S2212-5671(12)00042-1).
- Simionescu.M. (2016). The Relation Between Economic Growth and Foreign Direct Investment During the Economic Crisis in the European Union. *Journal of Economics and Business*, 34(1), 187-213.

- Susic, I., Trianovic, M. S., & Susic, M. (2017). Foreign Direct Investment and Their Impact on the Economic Development of Bosnia and Herzegovina. *IOP Conference Series: Materials Science and Engineering*, 200.
- Takagi, S., & Shi, Z. (2011). Exchange Rate Movements and Foreign Direct Investment (FDI): Japanese Investment in Asia, 1987-2008. *Japan and the World Economy*, 23(4), 265-272. .
- Wattanakul, T. (2018). Analysis of Relationship Between GDP and FDI on the Economic Growth of Laos. *Economics World*, 6(4), 295-302.
- Weisskof, T. E. (1972). The Impact of Foreign Capital Inflow on Domestic Savings in Underdeveloped Countries. *Journal of International Economics*, 2(1), 25-38. [https://doi.org/10.1016/0022-1996\(72\)90043-8](https://doi.org/10.1016/0022-1996(72)90043-8).204
- Wint, A., & Williams, D. (2002). Attracting FDI to Developing Countries. *International Journal of Public Sector Management*, 15(5), 361-374.