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Factors Affect Flow of Foreign Direct Investment (A Case Study of South Africa:1970-2014)

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Abstract
Foreign Direct Investment serves as an essential catalyst for development and economic growth of a nation and its inflow has increased massively in the last few decades. Africa receives a minute amount of the global value of FDI with South Africa, the Rainbow Nation receiving a lion's share of the value to Sub-Saharan Africa. However, the trickle- down effect of the spill-over of FDI inflow is arguably not widely benefiting the masses as unemployment and poverty rates remains very high; poor service delivery and affordable public health services still a major problem. As a result, there is a need for more FDI to mitigate the problems. Consequently, the researchers aim to identify factors affecting FDI flow to South Africa by using annual data from 1970 to 2014. The researchers used Multiple Linear Regression model to establish a relationship between Foreign Direct Investment and Gross Domestic Product, Real Interest Rates, Gross National Income, Gross National Expenditure, Official Exchange Rate and Gross Fixed Capital Formation. The empirical results indicate that Gross Domestic Product, Gross National Income, and Gross Fixed Capital Formation are highly significant and positively affect FDI flow to the Rainbow Nation. Furthermore, the results indicate that Gross National Expenditure is highly significant but negatively affect FDI flow. Notwithstanding, Official Exchange Rate and Real Interest Rates have no statistically significant relationship with the FDI inflow to South Africa.
Keywords: Foreign Direct Investment, Gross Domestic Product, Gross National Income, Gross National Expenditure, Gross Fixed Capital Formation, Real Interest Rates, Official Exchange Rate

1. Introduction

Foreign Direct Investment (FDI) is simply defined as foreign ownership of operating assets, such as factories, mines and lands. Multinational Corporations aims to establish lasting interest in an entity that is resident in an economy other than that of their own. As per this definition, there is a lasting relationship between the direct investor and the direct investment entity and a substantial degree of control or influence on the management team of the entity (OECD Benchmark Definition of FDI, 2008).

Foreign Direct Investment is regarded by many as a catalyst of economic growth and development. It is essential to the future economic development of developing nations. Therefore, many countries are developing strategies and policies to attract foreign investors. Recourse to the International Monetary Fund working paper on the determinant of FDI, indicates that countries are generally interested in attracting FDI in the primary sectors such as petroleum, mining and agriculture for the purpose to increasing revenue and reducing unemployment. As a result, at the end of the 20th century FDI to developing countries increased to nearly 400%. And this has increased in the new millennium but was hugely affected by the recent Global Financial crisis of 2007-2008.

Despite the global increase in FDI, Africa sees a minute amount. Africa is unarguably one of the richest continents in the world. However, most African countries, of which South Africa is no exception, lack adequate capital, advanced technology, good health facilities, basic social services and infrastructure development. These and many more including poor governance, high unemployment rate and corruption are a pile of problems that stagnate economic development in Africa. South Africa, in particular, has received the largest amount of FDI to Sub-Saharan Africa. Notwithstanding, poverty and unemployment rates are still very high demonstrating the need for more FDI. In view of this, this paper investigates the factors affect the flow of FDI to South Africa. It is our fervent hope that the findings of this research work will provide valuable information for stakeholders and policy makers in making appropriate decisions that will improve their economy and mitigate the problems of poverty and unemployment amongst others.

2. Literature Review

There are many empirical studies on FDI and its determinants, analysis of the factors that affect FDI flow, as well as FDI and its impact on economy growth in Africa, Sub-Saharan Africa, South Africa, least developed countries, developing countries and even emerging economies.

Abdela (2015) investigated the determinants of FDI to 33 Sub-Saharan African countries for a 14 year period from 1998-2012. The researcher categorized the variables in five main parts: Economic Determinants

(Market Size, Rate of Return, Government Consumption, Exchange Rate, & Inflation); Institutional Factors (Trade Openness, and Official Development Assistant); Infrastructural variables (Telephone line per 100 people & Electricity production); Human Capital Accumulation variables (Total Labour Force, Primary and Secondary school completion as well as Enrolment Rates); and Natural Resource variable (Natural Resource rents). While using fixed effect regression method, the findings of the study suggest that Rate of Return, Trade Openness, Official Development Assistance, Electricity Production, Natural Resource Rent and Human Capital Accumulation are significant determinants of FDI inflow to SSA whereas Inflation negatively affects FDI inflow.

Awan et al. (2014) endeavour to establish a relationship between FDI on the one hand and Gross Capital Formation, Gross National Income, Import, Export, External Debt and Military Expenditure on the other hand. They used the multiple linear regression and the results indicates that gross capital formation, exports, gross national income have significant and positive effect on FDI flow to Pakistan. Meanwhile, external debt also was significant but negatively affects FDI flow while imports have a negative relationship with FDI inflow to Pakistan. The results also showed that Military Expenditures have a significant but negative relationship with FDI inflow. Moreover, Pham and Duc Nguyen (2013) investigated the empirical linkage amongst FDI, Real Exchange rate and export in a co-integration framework in Vietnam. Findings from their research point out that exports are significantly affected by Real Exchange Rates while exports are also significantly affected by FDI.

Meanwhile, Boahen and Evans (2014) examined the short-run and long-run movement of interest rate volatility, exchange rate volatility and FDI using vector auto regression model. The results showed that volatility of interest rate affects exchange rate and market attractiveness and thus affect FDI in the long run. Moreover, the results further indicate that stable exchange rate and interest rate increase FDI inflow in Ghana. More so, Antwi et al. (2013) endeavour to find a relationship between FDI and economic growth in Ghana. They used annual time series data from 1980-2010. The researchers employ the simple ordinary least square (OLS) regressions. The empirical analysis was conducted with GDP growth rate, GDP, GNI, External Debt Stock, manufacturing value added, trade, inflation, Industry Value Added and FDI as variables. The result found that GDP growth rate, GDP, GNI, Manufacturing value added, and trade significantly influence and explain FDI at the 5 percent significance level.

Many researchers provide a variety of literature works using different factors that affect FDI inflow. Jadhav (2012) investigated the FDI determinants in BRICS Economies analyzing economic, institutional and political factors. The BRICS countries involve Brazil, Russia, India, China and South Africa. The researcher used panel data and multiple regression method for the 10 years span study (2000-2009). The variables used were Trade openness, Market size, Natural Resources as economic determinants while macroeconomic stability in the form of interest rate; Political Stability (No violence), Control of Corruption, Government effectiveness, Regulatory quality, Voice and Accountability, Rule of Law used as institutional and political determinants of FDI. On the overall, the results show that economics factors are more significant than political and institutional factors that drive FDI flow in BRICS economies. Furthermore, the results suggest that market size which is a measure of real GDP is significant and that most investment in the BRICS countries are driven by market-seeking.

Relative to the South African economy, the research by Adrino (2012) endeavoured to establish the effect of FDI on economic growth. While using real GDP, domestic investment, real exchange rate, foreign marketable debt and FDI, the research long run findings suggest that FDI, real exchange rate and foreign marketable debts have a negative impact on growth. Meanwhile the short run results indicate that real GDP does not exert much impact and that FDI in the short run impact growth positively.

In the research of Gichamo (2012) on the determinants of Foreign Direct Investment inflows to Sub-Saharan Africa: a data analysis approach, the research found that Gross Fixed Capital Formation, GDP, GDP per capita, Trade Openness, GDP growth, Inflation are significant explanatory variables for the flow of FDI to Sub-Saharan African Countries. Additionally, Ogun et al (2012) used the Granger causality and simultaneous estimation techniques to determine the extent to which exchange rate stifle FDI inflow in Sub-Saharan Africa. The findings show statistically significant relationship between the variables thus indicating that FDI flows are affected by Real Interest rate movements in Sub-Saharan Africa. Also not so surprisingly, Elsharif-Suliman's (2006) investigations on the relationship between FDI and exchange rates for low-income countries of Sub-Saharan Africa provides empirical literate indicating that the depreciation of real exchange rate attracts FDI in Sub-Saharan Africa whereas increase in real exchange rate volatility stagnate FDI flow to low-income countries of Sub-Saharan Africa.

Chingarande et al. (2012) sought to establish a relationship between interest rates and FDI inflows using monthly data for Zimbabwe from February 2009 to June 2011. Their results indicated that rate of interest have no significant relationship with FDI flow. They also found risk factor is the major determinants of FDI to the Zimbabwean economy.

In his working paper for the African Development Bank, Anyanwu (2011) conducted a research in order to provide answer for what determines FDI inflow in Africa spanning from 1980 to 2007. His research

results show that there exist a positive relation between FDI and market size and that trade positively affect FDI inflows. It further indicates that financial developments negatively affect FDI inflows and that high government consumption expenditure attracts the flow of FDI to Africa. Furthermore, the results suggests that agglomeration has a strong and positive impact on the inflow of FDI to Africa and that natural resource endowment and exploitation (with emphasis on oil) attracts huge FDI into Africa. According to the report, East and Southern African regions appears to attract higher levels of FDI.

Additionally, the research of Shiro (2009) on the impact of FDI on the Nigerian Economy found the existence of positive relationship between FDI and GDP, Gross Fixed Capital Formation and the Index of Industrial Production. However, based on the results the researcher suggested that FDI has not contributed much to the growth and development of Nigeria.

Del Bo (2009) investigated FDI, Exchange Rate variability and Political Risk between developed and developing countries in 2009. The research findings suggest that both political risk and exchange rate variability have a dampening impact on FDI. Adams (2009), tried to answer the question "Can foreign direct investment (FDI) help to promote growth in Africa?" His work resulted to two major findings. According to his findings, the presence of FDI in host countries serve as a major contributor to economic growth by augmenting of domestic capital and the enhancing of efficiency through the transfer of new technology and managerial skills, innovation and best international practices. The second major finding is that cost and benefits of FDI is determined by specific policies and conditions. He however suggests that while FDI is significant for economic growth, it is not a sufficient condition.

Kyereboah-Coleman & Agyire-Tettey (2008) examine exchange rate volatility effect on FDI in Sub-Saharan Africa making Ghana the case study. Their findings suggest that exchange rate volatility negatively affect FDI inflow and that political factors and stock of FDI are likely to attract FDI; however, foreign investors do not consider market size in making decision to invest in Ghana.

Elsewhere, research of Brzozowski (2003) on Exchange Rate Variability and Foreign Direct Investment: Consequences of EMU (European Economic and Monetary Union) Enlargement, tried to analyse theoretically and empirically the impact of the reduction in exchange rate uncertainty due to the EMU accession on the intensity of FDI inflow into accession countries. The results showed that exchange rate and volatility may negatively affect the decision to locate investment in transition and accession countries. But most importantly, the findings suggest that euro adoption is likely to exert a positive influence on FDI inflows in accession countries.

According to the findings of Chen and Démurger (2002), FDI is a major contributor to the total factor productivity and income growth in host economies more than domestic investment. They further strengthen their argument that policies promoting indigenous technological capacity, like technical training, formal higher education as well as research and development increase the aggregate rate of technology transfer from FDI. According to them export promoting trade regime are significantly the basis for positive impact on FDI.

More than just involving exchange rate and FDI, Goldberg and Klein (1998) investigated the relationship among trade, FDI and the real exchange rate between a set of South East Asia and Latin American Countries by Japan and the United States. The results indicated that FDI by both United States and Japan to the East Asian countries are affected significantly by bilateral real exchange rates. Additionally, the results suggest that trade is significantly affected by FDI.

While using data of FDI flow from Industrial countries to sixty-nine (69) developing countries for a period of two decades, Borensztein, De Gregorio, and Lee (1998), investigated the effect of FDI flow on economic growth in a cross country regression framework. Amazingly, their results shows the important link between FDI and economy growth more than domestic investments.

3. Research Methodology

In this segment we present the research design, discuss the data types and sources, define the variables and explain the model. The data of this study consist of secondary annual data obtained from the websites of the World Bank and the Reserve Bank of South Africa. The research data spans from 1970 to 2014.

The selected variables of the study include the following:

- Foreign Direct Investment (FDI): Reflects the direct investment equity flows in a reporting economy. It refers to the sum of equity capital, reinvestment of earnings, as well as other capital. Direct investment denotes a sort of cross-border investment associated with a resident in an economy having control or a significant influence on the management team of an enterprise that resides in another economy. Ownership of 10% or more of the ordinary shares of voting stock is a basic criterion for determining the existence of a direct investment relationship. The Data used herein are in current U.S. dollars.
- Gross Domestic Product (GDP): Means the sum of gross value added by all resident producers in an economy in addition to any product taxes minus any subsidies not inclusive of the value of the products. It can be calculated without making depreciation deductions for fabricated assets or for

depletion and degradation of natural resources.

- Gross National Income (GNI): (formerly GNP) Is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the output valuation in addition to net receipts of primary income from abroad. Primary refers to compensation of employees and property income. GNI represents the entire market value of all final goods and services produced and the factors of production located within the territorial boundaries of a nation in a given period.
- Gross National Expenditure (GNE): Is the combined amount of all expenditures including those which are private and public. GNE differs from GDP in that expenditures on exports are not included.
- Real Interest Rate (RIR): Denotes the lending interest rate adjusted for inflation as measured by the GDP deflator. The terms and conditions attached to lending rates differ by country. This limits their comparability.
- Official Exchange Rate (OER): Refers to the exchange rate determined by national authorities or legally sanctioned exchange market. It can be calculated as an annual average predicated upon monthly averages (local currency units relative to the U.S. dollar).
- Gross Fixed Capital Formation (GFCF): Essentially GFCF can be referred to as net investment. More precisely it measures fixed capital net increase. GFCF includes equipment purchases, machinery, and spending on land improvements; the construction of roads, private residential dwellings, railways including commercial and industrial buildings. Fixed assets disposal is taken away from the total (http://www.indexmundi.com, (2015).

We aims to determine the factors that affect FDI flow to South Africa. In order to do this we must establish a relationship between FDI, and GDP, GNI, RIR, GNE, GFCF, and OER. Therefore, we adopt the Multiple Linear Regression Model and it can be expressed as:

$$y=\alpha+\beta 1x1+\beta 2x2 + \varepsilon$$

Here y is the dependent variable, α is the intercept, $\beta_1$and β_2 are the regression coefficients. Each coefficient represents the change in the dependent variable (Y) for every one unit change in the respective independent variable (x). ε is the error term of equation.

As such we remodel the equation as:

$$FDI = f (GDP, GNI, RIR, GNE, GFCF, OER)$$

Therefore we can restate the regression model for this study as follows:

$$FDI = \alpha + \beta 1GDP1 + \beta 2GNI2 + \beta 3RIR3 + \beta 4GNE4 + \beta 5GFCF5 + \beta 6OER6 +\varepsilon$$

4. Empirical Results

Before applying the regression model, we needed to test whether the series is characterized by a unit root or not. Furthermore, if the process contains a unit root, non-stationarity procedure is employed (Brooks, 2008). We consider the result in Trend and Intercept. As shown, FDI and RIR are stationary at level; OER, GFCF, GNE, and GNI are all stationary is first difference as indicated by the probabilities.

Table 1. Unit Root Test Results

ADF (Augmented Dickey-Fuller) Unit Root Test					
	Intercept			Trend & Intercept	
Variables	t-statistics (Prob.)	Critical Value		t-statistics (Prob.)	Critical Value	
FDI	-0,151 (0,937)	-3,600 -2,935 -2,606	(%1) (%5) (%10)	-5,134 (0,001)	-4,181 -3,516 -3,189	(%1) (%5) (%10)
OER	-4,944 (0,000)	-3,592 -2,931 -2,604	(%1) (%5) (%10)	-5,019 (0,001)	-4,186 -3,518 -3,190	(%1) (%5) (%10)
GFCF	-3,952 (0,004)	-3,592 -2,931 -2,604	(%1) (%5) (%10)	-3,942 (0,019)	-4,186 -3,518 -3,190	(%1) (%5) (%10)
GNE	-5,022 (0,000)	-3,597 -2,933 -2,605	(%1) (%5) (%10)	-5,136 (0,001)	-4,192 -3,521 -3,191	(%1) (%5) (%10)
GNI	-5,236 (0,000)	-3,597 -2,933 -2,605	(%1) (%5) (%10)	-5,334 (0,000)	-4,192 -3,521 -3,191	(%1) (%5) (%10)
RIR	-3,266 (0,023)	-3,589 -2,929 -2,603	(%1) (%5) (%10)	-3,854 (0,023)	-4,181 -3,516 -3,188	(%1) (%5) (%10)
GDP	0,407 (0,981)	-3,597 -2,933 -2,605	(%1) (%5) (%10)	-2,501 (0,326)	-4,186 -3,518 -3,189	(%1) (%5) (%10)

Notwithstanding, the researcher did not measure the stationarity of GDP with reasons provided herein. Aslanidis and Fountas (2014), while using historical data of real GDP for more than 100 years for industrial countries in a Pesaran panel unit root test, the result show that only few countries' real GDP is stationary and that real GDP is less stationary mostly in fixed exchange rate regimes. Also in their research: 'Are the Real GDP series in Asian countries nonstationary or nonlinear stationary?' Jannati, Sultana and Rayhan (2013) test result shows that about one-third of the Asian countries' (5 Countries) per capital real GDP series were found to be stationary. However, for majority of the countries' Real GDP per capital series were found to be non-stationary. Also in their research, Balcilar et al (2015), they test for trend stationarity using Novel approach which extends standard ADF test where the null is a function of multiple regimes. As a result they noted in quote "South African GDP is not trend-stationary". Additionally, T. Chang et al. (2006) used the SURADF tests to investigate the time-series properties of Real GDP for 47 African Countries for the span of 1980-2004. According the empirical data from several panel-based unit root tests indicate that per capita real GDP of all the countries studied are non-stationary. On the other hand, while using the SURADF test the results showed that only two third (2/3) of the countries under review have unit root.

The empirical results of this study are shown in the table and explanations are given below:

FDI = -1.29E+09 + 0.019179GDP + 0.230425GNI + 32877128RIR -0.302204GNE + 0.370839GFCF + 5180958OER + e

Table 2. Equation Results

Variables	Coefficient	Std. Error	t-Statistic	Probability
C	-1.29E+09	4.39E+08	-2.93388	0.0057
GDP	0.019179	0.00276	6.949271	0.0000
GNI	0.230425	0.091936	2.506355	0.0167
RIR	32877128	54680440	0.601259	0.5513
GNE	-0.302204	0.098987	-3.052964	0.0042
GFCF	0.370839	0.124368	2.98178	0.005
DOER	5180958	5984531	0.865725	0.3922
R-squared	0.713701		Durbin-Watson Stat	2.343096
Adjusted R-squared	0.667274		Mean dependent var	1.77E+09
S.E. of Regression	1.61E+09		S.D. Dependent var	2.79E+09
Sum squared resid	9.58E+19		F-statistics	15.37258
Log likelihood	-991.368		Prob. (F-statistics)	0.000000

The above table presents the empirical results of the model. As indicative of the results, GDP and FDI are positively related and that GDP is highly significant at 1 percent level having a coefficient of 0.019179 which means that for one unit increase in GDP there is one unit (almost 2) increase in FDI inflow to South Africa. Additionally, the results show a positive relationship between FDI and GNI; GNI is significant at 5 percent level of significance with a coefficient of 0.230425 meaning that for one unit increase in GNI there is 23 unit increase in FDI inflow.

Real Interest rate and FDI have no statistically significant relationship as shown by a 0.5513 probability and a coefficient of 32877128. Notwithstanding, Gross National Expenditure and FDI have a negative relationship and GNE is highly significant at a 1 percent levels with a coefficient of -0.302204 indicating that for every 1 unit increase in GNE will lead to 30 unit decrease in FDI.

Additionally, Gross Fixed Capital Formation and FDI have a positive relationship with highly significant value of 1 percent level of significance showing a coefficient of 0.370839 indicating that a unit increase in GFCF increases FDI but 37 units. Lastly, there exist no statistical significance relationship between Official Exchange rate and FDI as indicated by a probability of 0.3922 greater than 5 percent with a coefficient of 5180958.

Jointly, the independent variables are statistically significant at 1 percent level of significant indicating that on the overall there is a positive and highly significant relationship between the independent variables and FDI.

In order to determine the fitness of the model, the researchers tested for serial correlation and heteroscedasticity using the Breusch-Godfrey Serial Correlation LM Test and the Breusch-Pegan-Godfrey heteroscedasticity test respectively. The results of the serial correlation test shows that the residual has no serial correlation as indicated by the probability of the observed R-Square of 0.2127. This value of 21 percent is greater than the 5 percent critical value thus we accept the null hypothesis that the residual is not serial correlated. Additionally, the result of the homoscedasticity test indicates that the residual is homoscedastic as shown by the probability of observed R-Square of 0.2985. The value is greater than the 5 percent critical value therefore we accept the null hypothesis that the residual is homoscedastic. The results are displayed in the table below.

Table 3. Correlation Results

Breusch-Godfrey Serial Correlation			
F-Statistics	1.324322	Prob. F(2,35)	0.2790
Obs* R-squared	3.095472	Prob. Chi-square(2)	0.2127
Breusch-Pegan-Godfrey Heteroscedasticity Test			
F-Statistics	1.216271	Prob. F(2,35)	0.3200
Obs* R-squared	7.248593	Prob. Chi-square(2)	0.2985

4. Conclusion

Initially we use the probability of the F-statistics to test whether the multiple linear regression model is significant. Subsequently, to prove that the model is significant for the study we perform diagnostic tests by checking for serial correlations and heteroscedasticity. The results showed that the residuals are not serial correlated and the variance of the residuals is homoscedastic.

The results of the study show that Gross Domestics Products, Gross National Expenditure and Gross Fixed Capital Formation are significant to the inflow of FDI in the South African Economy at a 1 percent Level of Significance. Furthermore, Gross National Income is significant at the 5 percent level of significance.

However, Real Interest Rates and Official Exchange Rates are not significant to the flow of Foreign Direct Investment in the South African Economy. We are aware that Gross National Income shows the ability of the local population to demand for the product thus making it very essential to this study. It is therefore expedient that foreign investors ascertain the market opportunity before making investment decisions.

The results of GDP is consistent with the researches of Jadhav (2012), Gichamo (2012) and Shiro (2009) that GDP is a significant influencer of FDI inflow. Also the result of Antwi et al. (2013) and Awan et al. (2014) support our researcher outcome indicating that GNI is a significant factor that influences the inflow of FDI. Consistent with the research on Zimbabwe by Chingarande et al. (2012), our results show that there is no statistically relationship between FDI and real interest rates. The result of Official Exchange Rate is consistent with the findings Ogun et al (2012). The result of GNE is highly statistically significant at 1 percent significance level and matches the result of Anyanwu (2011) that FDI inflow is influenced by consumption expenditure of government. Relative to Gross Fixed Capital Formation, the result follows the results of Gichamo (2012) and Shiro (2009) that GFCF is a significant determinant of FDI inflow.

Predicated upon the results obtained from the study, we therefore accept the Null hypothesis (H0).

This research serves as an informative tool for attracting FDI. As such the results of the study can serve as a guide for policy makers and stakeholders and local firms to focus their policies on improving GDP, GFCF, GNI and GNE to attract more FDI inflow to South Africa.

After a review of the empirical findings and analysis of this research and related researches, it is recommended that Monetary and Fiscal policies should aim to create a conducive environment for investors and an increase in credit to the private sector. Meanwhile, government should encourage joint ventures especially the ones that will increase capital and provide more employment opportunities. Policy makers and stakeholders should institute policies that will promote the diversification of investment on a cross sectoral basis. Also, the Policy makers should encourage transparency and accountability in the operations of foreign companies especially those in the natural resource extraction sector.

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