Determinants of Foreign Direct Investment in South Africa

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Abstract: Many developing countries across the world have been on a quest to attract foreign direct investment which is considered a significant component for ensuring economic growth, development and employment creation. The South African government has developed, and designed policies for attracting foreign direct investment (FDI) inflows into the country; however, these they have not borne enough fruits since FDI inflows are still below the expected level. Therefore, the study aimed to investigate various determinants of FDI in South Africa. The study employed the Autoregressive Distributive Lag (ARDL) methodology using yearly secondary data from 1980 to 2018. The bounds test for cointegration was utilised to check the association and link among the variables used in the study in the long-term. In the FDI series a long-term relationship was revealed by ARDL bounds test results. The ARDL results showed that determinants had different impact on FDI. In summary, government expenditure, economic infrastructure and economic growth are significant strong long-term determinants of FDI. However, inflation yielded negative significant effects on FDI. All the models estimated indicated negative and significant error correction term implying that disequilibrium in the current year in the model would be corrected in the subsequent years. It can be recommended that the South African government should prioritize its government expenditure and growing economy with a view of attracting FDI inflows into the economy. While reprioritizing its government expenditure and economic growth, it should focus more on improving infrastructure to attract foreign direct investment by reducing the cost of doing business in the country. All this should be done in an economy that puts its inflation under control, as it could be seen that the lesser the inflation rate the more the country can attract foreign investors.

Keywords: Autoregressive Distributive Lags (ARDL), Foreign direct investment, Economic infrastructure, Economic growth Government expenditure, Inflation

1. Introduction

Many developing countries across the world including South Africa have been searching for ways to attract foreign direct investment (FDI) as it is crucial in economic development, employment creation and economic growth (Adhikary, 2011; Mahadea & Simson, 2010). FDI is investment that is made in a firm by a third party often said to be an interested party from another country, for which the investor will take the ownership or control over that particular firm in the host country. According to Mahembe (2014), FDI can be referred to as the process whereby the domestic residents of the country (which is the home country), takes control or ownership of assets, production and other operations of a company established in another nation (the mother country). FDI is classified as capital flows resulting from the conduct of multinational corporations (Agiomirginakis, Asteriou & Papathoma, 2003; Glick, 2016). Consequently, the factors that have an impact on the Multinational Corporation (MNC) may also have an effect on the magnitude and the direction of FDI inflows.

Some authors mentioned that South African FDI improved in the post-apartheid era though it is still below the expected level (Thomas & Leape, 2005; Kinda, 2010). To ensure that FDI directions are in their favour most countries are committed to changing their economic policies, including taxation, tariff barriers, subsidies, domestic market conditions, privatization and government framework. During the global financial crisis of 2007-2008, a decline in FDI inflows globally was experienced (Jude & Levieuge, 2017). Emerging markets have drawn more than 50% of the world FDI inflows as per the World Investment Report (2011). Although there have been many improvements in the macroeconomic situation, South Africa compared to other middle-upper level income countries have attracted lesser FDI (Thomas & Leape, 2005). The United Nations Commission on Trade and Development (UNCTAD) (2018) indicated that inflows of FDI into South Africa declined by 41%, due to underperformance in the commodity sector as well as political uncertainty. The unreliable political situation generally has a negative impact in influencing the decision of investors to invest in a

country (Dunning, 2003). Hence, it was imperative to do a study that could find out what determines FDI, to contribute in boosting the country's growth prospects.

Studies such as Siddiqui and Ahmed (2007), Ebiringa and Emeh (2013), Theresa (2014), Sichei and Kinyondo (2012) and Gharaibeh (2015) are some of those that examined the determinants of FDI and found various macroeconomic variables to be attracting FDI. However, these studies were not based on the South African context and they did not cover the period from 2015 to 2017, which the study will be taking in consideration. Thus, with the aim of achieving high level of FDI inflows there is a need to identify important factors that could enhance FDI inflow. This research attempts to investigate the various factors that could attracts FDI into South Africa, and further find out what could work for South Africa by filling the literature gaps that exist.

2. Literature Review

Firstly, the study adopted the eclectic paradigm theory which was first introduced by Stockholm (1976); however, its origin can be traced back in the mid-1950s. This theory provided a holistic framework to evaluate and identify the importance of factors that influences firms to initiate foreign production (Dunning, 2001). According to the eclectic paradigm, MNCs engage in foreign direct investment based on three advantages: O, ownership; L, location; I, internalization advantages.

A theory of industrial organization was also adopted. The theory came into existence in the 1960s, however, it was first published in the year 1977 by Stephen Hymer and it was adding to the then existing study of imperfection theory by Kindleberger (1969). The hypothesis is based on the supposition that the business is interest to obtain larger market opportunities and investment decisions to a foreign country is based on strategies that involve certain advantages: product differentiation, ownership advantage, low cost of production, government incentives and better facilities such as transport facilities. It implies that firms are able to obtain and utilize some resources from host countries for which they are not able to obtain in the domestic economy (Kok & Ersoy, 2009; Morgan & Katsikeas, 1997). The theory responded to criticism of international trade theory's perfectly competitive assumption of the market that was derived from the imperfect market structure assumption (Vijayakumar, Sridharan & Rao, 2010).

Researchers in the past few decades have dedicated much of their time and attention to explain the factors that determine the direction of FDI inflows. Global literature yields contradicting relationships on the determinants of FDI which makes it more difficult to undertake a complete review of what attracts FDI inflow into a country. Anyanwu (2012) found that there is a positive association between market size, trade transparency, natural resources and FDI, while enhanced financial growth has an adverse impact on FDI. Asiedu (2002 & 2006) found the promotion of FDI by natural resources and by major markets, however related results are political stability lower level of inflation, improved infrastructure, skilled workforce, access to trade, less inequality, and a stable legal system. On the other hand, Loots & Kabundi (2012) alluded that FDI inflows in Africa can be influenced by oil exports and trade openness. However, in South Africa there is limited literature available on what determines FDI. Based on the existing econometric evidence and country studies there are different factors that determine FDI inflows into countries, ranging from productivity, exports, free trade, exchange rates, money supply, inflation rates to borrowing costs (Boateng, Hua, Nisar & Wu, 2015).

The causal connection between FDI and current account was explored by Siddiqui and Ahmed (2007) using data from 1976 to 2005. The research used the Johansen co-integration approach and ECM (Error Correction Model) to test both the long-run and short-run association between the study variables. The study indicated only a long-run unidirectional relationship from FDI to current account. In another study by Ebiringa and Emeh (2013) from the period 1980 to 2010 using Vector Error Correction Model (VECM) methodology, inflation, exchange rate, gross domestic product and cost of borrowing were found to influence long term FDI. The variables both individually and jointly were found to have a relationship with FDI.

To find the factors determining foreign direct investment in Zambia, Theresa (2014) used time series data in an Ordinary Least Squares (OLS) framework from the period 1990 to 2011. The study concluded that in Zambia, the major determinants of foreign direct investment were infrastructure development, trade openness, and availability of resources,

exchange rate and inflation. The study further revealed that although Zambia is well known for its mining sector, to attract foreign direct investment Zambia does not depend on natural resources.

Sichei and Kinyondo (2012) measured FDI determinants in 48 African nations. In their study, data from 1980 to 2009 were compiled using different macroeconomic factors, such as natural capital, GDP growth and trade transparency. The analysis showed a favorable association between all variables and foreign direct investment. Gharaibeh (2015) using multiple regressions in the form of Ordinary Least Square (OLS) determined the association between FDI and the factors that were assumed to be FDI determinants to attract inflows into Bahrain. The study used data that was collected from the period 1980 to 2013 on a time series analysis. The results from the empirical evidence of the OLS regression provide that inflation, government expenditure, economic stability (borrowing cost, trade transparency, population and education) have a strong relationship with the flow of FDI into Bahrain. Though factors, such as market size and GDP growth have been found to have a negligible connection with FDI inflows. In their study, they also found infrastructure to be negatively affecting foreign direct investment.

A research on the macroeconomic determinants of FDI was carried out in South Africa by Dondashe and Phiri (2018). ARDL model was used in their study with the data used collected from the period 1994 to 2016. The inflation rate, real interest rate, government size, inflation rate, terms of trade and per capita GDP were some of the macroeconomic determinants of FDI that were used by the study. The study found these determinants to positively affect FDI however inflation was found to have an inverse relationship with FDI. The variables are in the short run positively and significantly correlated with FDI. Among the variables discussed in literature, it has been found that government expenditure, economic infrastructure, gross domestic product and inflation could influence FDI.

3. Method and Material

In order to find the determinants of FDI, eclectic paradigm and industrial organization theories were applied. The study found determinants of FDI employing an econometric methodology to give robust results and account for sensitivity in the chosen variables. Based on some reviewed literature and availability of data, the study adopted the following regression model (Anyanwu, 2012; Gharaibeh, 2015):

$$LFDI = f\left(LGEX,\ LINFR,\ GDP,\ INFL\right) \quad (1)$$

In a linear form, the model can be expressed as follows:

$$LFDI_t = a + \beta_1 LGEX_t + \beta_2 LINFR_t + \beta_3 LGDP_t + \beta_4 LINFL_t + \varepsilon_t \quad (2)$$

Where:

L is the log of all variables to standardize the values of the variables, α constant, $\beta_1 - \beta_4$ estimated coefficients and ε_t the disturbance term reflecting the influence of some excluded variables in the model. FDI_t is foreign direct investment which is investment by a foreign party taking ownership in the host country (Mahembe, 2014), GEX_t is government expenditure defined by Wanna *et al*. as public expenditure based on the budgetary process, $INFR_t$ is economic infrastructure as investment in public services, roads and other transport facilities (Sanchez-Robles, 1998), GDP is gross domestic product which measures economic growth and INFL is inflation, a general increase in prices.

The study employed data from the period 1980 to 2018 on yearly secondary time series, as available from the website. South African Reserve Bank (SARB) data website was used to collect the data for all the variables. In dealing with yearly time series analysis, unit root tests are important to indicate the order of integration. For each individual lag, time series data is viewed to be constant when it has constant mean, variance and auto-variance (Casson & Hashimzade, 2013). In addition, unit root tests will give way to which methodology to apply, whether auto regressive distributive lag (ARDL) or vector error correction model (VECM). Thus, to achieve the formal tests of Augmented Dickey-Fuller (ADF) tests were used. Also, structural breaks were tested with the Zivot and Andrew (ZAU).

Following the ADF and ZAU tests of unit root, ARDL bounds cointegration test was conducted to find out if there is relationship in the long-term. The bounds test was developed by Pesaran and Shin (2001) to analyze long term relationship between the variables. Thus, the tests for unit root gave way to employ the auto regressive distribution lag

(ARDL) methodology for confirming both the long-run and short-run estimates (Nkoro & Uko, 2016). The ARDL model used throughout the study is given as follows by Equation 3:

$$\begin{aligned}\Delta LFDI_t = {} & \beta_0 + \beta_1 LFDI + \beta_2 LGEX_{t-1} + \beta_3 LINFR_{t-1} + \\ & \beta_4 LGDP_{t-1} + \beta_5 LINFL_{t-1} + \sum_{i=1}^{p} \beta_6 i \Delta LFDI_{t-i} + \\ & \sum_{i=1}^{q} \beta_7 i \Delta LGEX_{t-i} + \sum_{i=1}^{r} \beta_8 i \Delta LInfR_{t-i} + \\ & \sum_{i=1}^{s} \beta_9 i \Delta LGDP_{t-i} + E_t\end{aligned} \quad (3)$$

Where Equation 3 builds from Equation 2, $\beta_1 - \beta_5$ represent long run coefficients and $\beta_6 - \beta_9$ represent short run coefficients.

The error correction model (ECM) was estimated to check the short-run effects on the dependent variable by independent variables (Noula, 2012). The ECM is employed in the study to test the check the adjustment speed and how the variables in the model migrate to equilibrium in the near future. Thus, error correction model in the study is defined by the equation below:

$$\begin{aligned}\Delta LFDI_t = {} & \beta_0 + \sum_{i=1}^{p} \beta_1 i \Delta LFDI_{t-i} + \\ & \sum_{i=1}^{q} \beta_2 i \Delta LGEX_{t-i} + \sum_{i=1}^{r} \beta_3 i \Delta LINfR_{t-i} + \\ & \sum_{i=1}^{q} \beta_2 i \Delta LGDP_{t-i} + \sum_{i=1}^{s} \beta_4 i \Delta LINFL_{t-i} + \\ & \lambda ECT + E_t\end{aligned} \quad (4)$$

Where Equation 4 builds from Equation 3, ECT reflects the Error Correction Term and λ explains the adjustment speed to equilibrium and it is the derivative of the residuals in Equation 4.

The normality, heteroscedasticity and serial correlation diagnostic tests are employed in the model. For normality we used the Kurtosis value which is expected to take a value around 3 (Thadewald & Büning, 2007). For diagnosing heteroskedasticity the study employed the White test and serial correlation developed the Breusch-Godfrey test. The cumulative sum and cumulative sum of squares are developed under the study to check whether the model is stable or not. These tests are developed and introduced by Brown, Durbin, and Evan (1975) to check the stability of the parameters. According to Pesaran and Shin (2002), square CUSUM is applied strictly to events that move at a fixed time period from beginning to end. The method is based on the scaled reciprocal residuals analysis which has a substantial benefit over the chow test as it does not include the previous information at which the presumed structural split happens (Chow, 1960). The reasoning behind the introduction of these tests was to ensure a diagnostic tool to check. Thus, these tests will be conducted to test if the model is stable and if ever there is existence of any structural break within the observation period.

4. Results and Discussion

Table 1 on the following page provides unit root test results for the estimated model with a number of variables namely FDI, economic infrastructure, GDP and inflation.

Results in Table 1 indicate that variables are integrated at different orders at level and after first differencing. There were also structural breaks identified at different periods in the time series. This gave way to use ARDL methodology as Nkoro and Uko (2016) alluded that it is the best technique to be used when there are both I(0) and I(1) and small sample size (39 observations).

Table 2 on the following page provides ARDL results of different estimated combinations. The models are estimated without dummy variable first, then immediately followed by the model including the dummy variable. It should be borne in mind that dummy variable controls for structural breaks detected in the unit root analysis.

Estimated models in Table 2, except in Equation 7, displayed a long run relationship in the ARDL bounds testing. If the F-statistics is higher than the lower and upper limits (see critical value limits), the sequence has a long-term relationship. The study's long-term relationship is aligned with Rachdi, Brahim and Guesmi (2016). Government expenditure, economic infrastructure and GDP are positive strong determinants of FDI. This is illustrated by general significant coefficients indicated in Table 2. On the other side, inflation is a negative significant determinant of FDI, indicating that FDI can be attracted if inflation is under control. This is the case in South Africa, where the monetary policy maintains a 3-6% inflation rate. The outcomes of this study agree with the theory of industrial organization that FDI could be attracted when there are government incentives and better facilities such as infrastructure facilities (Hymer, 1969). These findings are in line with literature by Ifeakachukwu, Adebiyi and Adedeji (2013) who found that government spending crowds out investment while Wheeler and Mody (1992) and

Table 1: Unit Root Results: 1980 - 2018

Variables	ADF (Trend and Intercept)		Break With Innovation Outlier (Trend and Intercept)			Break With Additive Outlier (Trend and Intercept)		
	ADF prob.	Order of integration	ADF prob.	Break Date	Order of integration	ADF prob.	Break Date	Order of integration
LFDI	0.8167	0	0.567	2005	0	>0.99	1995	0
DLFDI	0.0001	1	<0.001	2003	1	<0.001	2003	1
LINFR	0.7094	0	>0.99	2011	0	>0.99	2009	0
DLINFR	0.0237	1	<0.001	1994	1	<0.001	2001	1
GEXP	0.6769	0	0.171	2002	0	0.983	1998	0
LGEXP	<0.001	1	<0.001	2001	1	<0.001	2001	1
LGDP	0.9865	0	0.987	1994	0	>0.99	1991	0
DLGDP	0.0010	1	<0.001	1994	1	<0.001	1992	1
LINFL	0.0793	0	<0.001	2008	0	0.0181	1992	0

Notes: LFDI logged foreign direct investment, LINFR logged economic infrastructure, LGEXP logged government expenditure, LGDP logged gross domestic product, LINFL logged inflation.

Source: Author compilation from SARB data

Table 2: ARDL Bounds Test, Error Correction Term and Long Run Coefficients

Equation	Model	F-statistic	Long Run	ECT	Coefficients
1	GEXP, INFR	6.43	Yes	-0.95***	0.84***; 2.96***
2	GEXP, INFR, DUM	22.55	Yes	-0.66***	0.64***; 3.44***; -0.12
3	GDP, INFR	16.98	Yes	-0.12***	6.14***; 0.48
4	GDP, INFR, DUM	8.33	Yes	-0.19***	6.12**; -2.84**; -0.93**
5	GDP, INFL	5.58	Yes	-0.07***	10.19; -1.59
6	GDP, INFL, DUM	3.44	Yes	-0.14***	5.11;-0.58; -0.34
7	GEXP, INFL	2.13	No	-0.21***	7.83; -10.94
8	GEXP, INFL, DUM	11.54	Yes	-0.88***	5.88***; -7.3***; 0.53***
9	INFR, INFL	5.3	Yes	-0.29***	3.82***; 1.29***
10	INFR, INFL, DUM	4.89	Yes	-0.14***	0.127; 1.48***; -1.11

Notes: *** indicate significance at 1%; ** 5%; * 10%; GEXP government expenditure, INFR economic infrastructure, GDP gross domestic product, INFL inflation. Upper bound critical value at 1% is 4.44.

Source: Author's compilation from SARB data

Asiedu (2002, 2006) support the negative influence of inflation on FDI inflows and a positive relationship between infrastructure and FDI. Hakizimana (2015) found a favorable relationship between GDP and FDI.

The error correction (ECT) measures the rate at which the variables integrate to equilibrium. The coefficient of the error term was negative and significant at 1% at all levels as shown in Table 2. The results indicate that the shocks that caused disequilibrium in the previous years will be corrected to move back to equilibrium in the current year. Models that included government expenditure seemed to have the highest speed of adjustments (see ECT in equations 1, 2 & 8). This could be interpreted that government expenditure is the strongest determinant of FDI and could be utilized to attract FDI.

Table 3: Diagnostic and Stability Tests for Different Models

Equation	Model	Kurtosis	Heteroscedasticity	Serial Correlation	Stability Cusum
1	GEXP, INFR	3.15	0.5228	0.8832	Yes
2	GEXP, INFR, DUM	3.98	0.4697	0.9113	Yes
3	GDP, INFR	2.53	0.9984	0.8403	Yes
4	GDP, INFR, DUM	2.96	0.5155	0.8625	Yes
5	GDP, INFL	2.38	0.0647	0.8891	Yes
6	GDP, INFL, DUM	3.38	0.1199	0.1033	Yes
7	GEXP, INFL	4.79	0.7284	0.4484	Yes
8	GEXP, INFL, DUM	4.47	0.7587	0.7748	Yes
9	INFR, INFL	3.59	0.8560	0.2887	Yes
10	INFR, INFL, DUM	3.25	0.2232	0.9744	Yes

Source: Author's compilation from SARB data

Table 3 presents the diagnostic tests for normality and show that the residuals are normally distributed as kurtosis have a value around 3 as explained in Brooks (2008). The null hypothesis of no heteroscedasticity and no serial correlation are not dismissed because the p-values are higher than the 5 percent significance thresholds. CUSUM and CUSUMQ were used to test the models' stability. It was found in both figures that the CUSUM lines fall within the 5% significance line over time implying that the models are stable.

5. Conclusion and Recommendations

This study attempted to find factors that determines foreign direct investment (FDI) in South Africa, hence investigated various factors that could attracts FDI in South Africa. To achieve this aim, we employed an autoregressive distributive lag methodology using yearly secondary time series data from 1980-2018. All the variables data were obtained from the South African Reserve Bank. These factors were found from ten different estimated models of which five accommodated for structural breaks as yearly data is commonly affected.

This study found that a relationship in the ARDL bounds testing exist in the long run. The long run was confirmed when the F-statistic was greater than both the lower and upper bounds in all models except in the government expenditure inflation nexus. Government expenditure, economic infrastructure and economic growth were positive strong determinants of FDI. On the other side, inflation was a significant determinant of FDI, indicating that FDI can be attracted if inflation is and under control. It is important to note that South Africa has adopted an inflation targeting framework in its monetary policy since 2000. The coefficient of the disturbance term was negative and significant at 1%. The results indicate that the shocks that caused disequilibrium in the previous years would be corrected to move back to equilibrium in the current year. Models that included government expenditure seemed to have the highest speed of adjustments indicating that it is a strong determinant of FDI.

It is recommended that South Africa might consider reprioritising its expenditure with the view of attracting FDI inflows. This is because if the government continues spending with limited revenues it will accumulate more debt, which will paint a bad picture on rating agencies, and downgrade our economy. This could ultimately affect business confidence that is essential for attracting companies to conduct their activities in the country. However, with policy makers having to reprioritize expenditure, much focus should be aligned to infrastructure investment by improving infrastructure such as roads, rail and communications which are important to bring down the cost of doing business in the country for foreign investors. Also, the country needs to devise means to grow the economy, as it is indicated that economic growth can attract FDI.

Attracting FDI to the country would encourage activities on infrastructure development and this can ultimately create jobs and enhance economic growth. More so, the South African government should take utmost caution, such that future expenditures of the government do not crowd out

private investment especially foreign investment. Areas of future research could include studies focusing on some regions like SADC, Sub Saharan and BRICS countries and use panel data rather than time series data which is more efficient.

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