Foreign Direct Investment and Economic Growth in South Africa: On Direction of Causality

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ABSTRACT
The foundation of this paper is built on the premise that foreign direct investment (FDI) follows economic growth and development as opposed to the narrative that argues otherwise. Considering that background, this paper pursued finding the direction of causality and the kind of relationship that exists between the two main variables of interest (FDI and Economic growth) using time series data spanning 1980–2018. Using the vector-autoregressive error correction mechanism and the autoregressive distributive lag, our paper found neither uni nor bidirectional causality between economic growth and FDI in South Africa. The findings support the notion that FDI follows growth and development as opposed to the current policy stance that seeks to attract more FDI without exhausting the potential carried by domestic firms in stimulating economic growth. The results from Granger causality tests, however, could not reject the null hypothesis of the causality that runs from unemployment to economic growth. The study found that unemployment in South Africa Granger causes economic growth significantly. Recommendations arising from our findings are that South African policymakers may need to consider paying more attention to inward-looking policies. More efforts if possible should be put toward making sure that domestic investment is stimulated through making it cheaper especially for small businesses to secure funding as well as making the investment environment small business-friendly to improve their success and contribution toward sustainable economic growth.

KEYWORDS: Economic Growth, Foreign Direct Investment, Causality, Time Series.

1. INTRODUCTION

Global foreign direct investment (FDI) collapsed in 2020, falling 42% from $1.5 trillion in 2019 to an estimated $859 billion. That low level in global investment patterns was last seen in the 1990s, and it is more than 30% below the investment trough that followed the 2008–2009 global financial crisis. To add, the decline in FDI was concentrated in developed countries, where flows plummeted by 69% to an estimated $229 billion. Looking at the developing world, FDI decreased by 12% to an estimated $616 billion, which then accounted for 72% of global FDI (the highest share on record).

FDI is an important aspect in the macroeconomic dynamics of a country, and it has been at the center influencing policy design globally although more emphatically in developing countries. The general conventional belief especially with policymakers is that FDI has a significant positive contribution to economic growth (Barry *et al*., 2003; Ayyagari and Kosova, 2010). Investment by multinational companies in the host country is expected to positively influence output through technological innovations that will then lead to increased productivity or enhance the export potential of the host country (Greenaway *et al*., 2004). However, FDI to developing countries has been elusive (Global Finance, 2018). Investment flows remain scarce and limited in Africa in comparison to other continents. In 2018, Africa as a whole received an estimated total FDI of $653 billion. That figure is almost equal to what the United States of America ($311 billion) and China ($144 billion) received in the same financial year (Global Finance, 2018). This raises a big question of whether FDI follows economic growth or FDI leads to economic growth, a policy stance most African countries are pursuing today.

The argument on the impact of FDI on the economic growth of the host country is blurry and inconclusive with some finding a positive (Dunning, 1993; Haskel *et al*., 2007; Kneller and Pisu, 2007) and some negative (Dixit, 1980; Aitken and Harrison, 1999; De Backer and Sleuwaegen, 2003; Hall and Woodward, 2010). In addition to the inclusivity of findings in the literature, the direction of causality differs from one country to the other and is currently not clear for South Africa. Hence, this research focuses on checking the relationship and nature of causality between economic growth and FDI in South Africa.

The relationship or the causal direction between FDI and economic growth is important for developing countries like South Africa which are in need of new fresh capital and positive innovation spillovers. In an effort to lure more inward FDI, countries have come up with lucrative policies ranging from improving infrastructure, reducing corporate taxes, improving law

and order (reducing crime rates), and toning down corruption. According to the World investment report released by the United Nations Conference on Trade and Development (UNCTAD) in 2017, there is not a single country in the top 10 receivers of FDI. In the top 20, there are only 2 countries (Ghana and Mozambique), and South Africa does not appear anywhere close. This continues to further bring the importance of understanding what drives FDI and the direction of causality between FDI and economic growth.

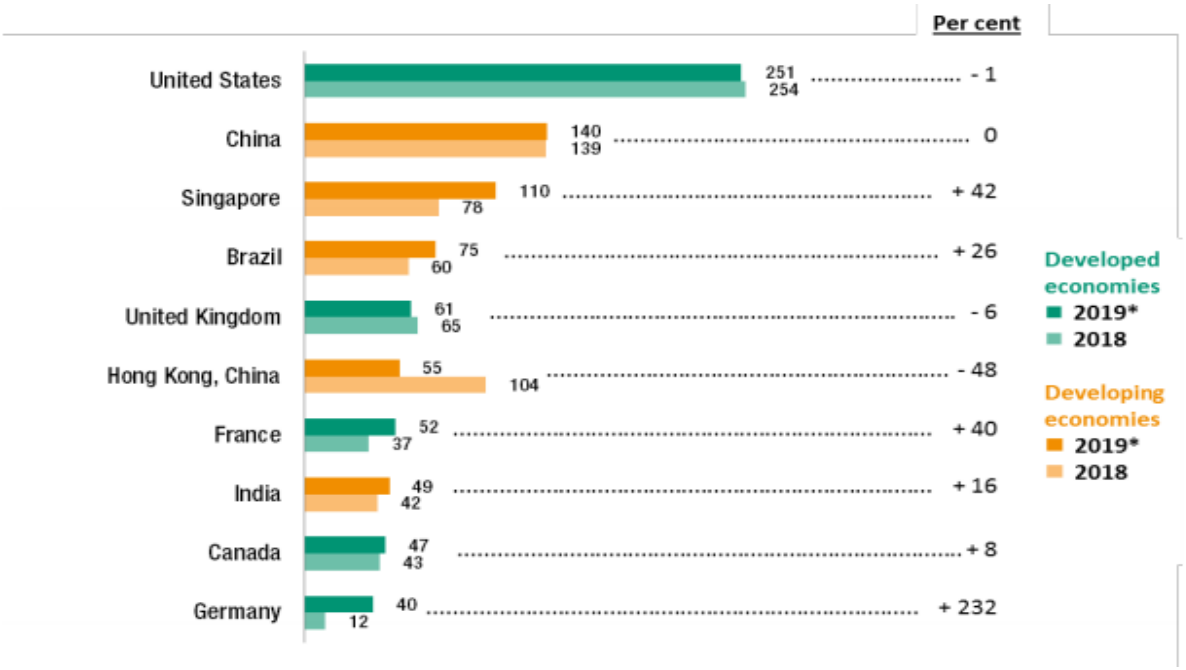


Figure 1. FDI inflows: top 10 host economies, 2018 and 2019* (Billions of US Dollars).
Source: UNCTAD (2020).

Figure 1 above shows that countries that are well developed with better financial systems and performing well economically attract more capital. Countries that are leading on the international export market happen to attract bigger portions of the world FDI and that is the basis of this study as we seek to understand the impact of low economic growth patterns South Africa experienced over the past years.

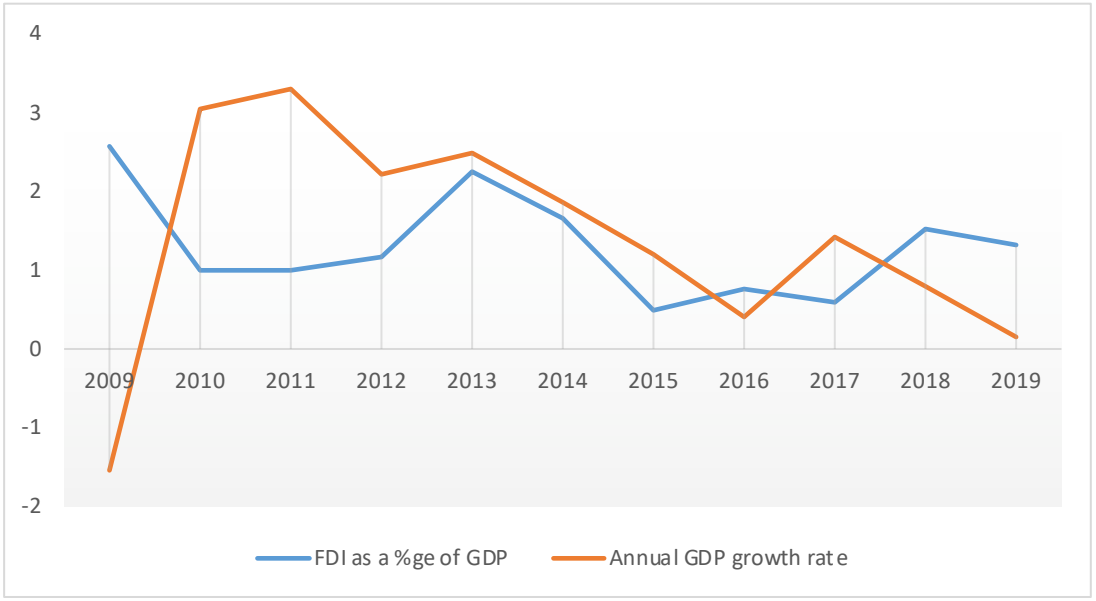


Figure 2. Graphical relationship between FDI and economic growth in South Africa.
Source: Author's calculation.

In reference to Figure 2 above, the relationship between FDI inflows and annual GDP growth is not easy to tell but it can be observed that both of them have not been impressive at least from 2012 until 2019. In that disappointing state, FDI has been steadily following an upward trend since 2015, but economic growth has not been responding positively to that upward trajectory being followed by FDI flows into South Africa. In fact, economic growth has tried to recover in 2016 but after only a year, it went down even further despite FDI steadily being slightly bullish.

The remaining part of the paper is organized as follows: the literature on the relationship between FDI and economic growth for both developed and developing countries, the methodology section of the paper, discussion of results, and lastly conclusion and policy recommendations.

2. LITERATURE REVIEW: RELATIONSHIP BETWEEN FDI AND ECONOMIC GROWTH

In as much as a quite huge volume of literature has focused on this relationship, there is still inconclusiveness and submerged when it comes to the direction of causality between the two variables as well as the impact of one on the other (Kisswani *et al.*, 2015). The main reason for such a disparity in the literature might be the heterogeneity that exists in the countries' policy direction as well as the structure of economies (Li and Liu, 2005). The results under this paradigm are split or cut up into two distinct pillars (positive or negative impact on each other).

2.1. POSITIVE EFFECT OF FDI ON GROWTH

The neoclassical growth model rests on the assumptions that FDI stimulates growth through the expansion of total investment levels. Unlike the neoclassical model, the endogenous growth model argues that FDI promotes growth through knowledge and technological spillovers from the developed world into the developing countries. The argument of the endogenous growth model posits that when a country receives FDI, those international companies bring new ways of production and new knowledge of production hence pushing the production possibility frontier outside. Zhao and Zhang (2010) concur with the assumptions of the endogenous growth model by citing that FDI positively contributes to high GDP per capita levels and industrial activity at a macro level. FDI brings new inputs, technology, better managerial practices, and enhanced research and development at the firm or national level (De Mello, 1997; Paloni *et al.*, 2001; Xolani, 2011). Supporting a positive relationship between FDI and economic growth, Waldkirch *et al*. (2009) argued the relationship from the employment perspective. The scholars argue that FDI is a major source of employment in the host country hence improving the buying power of citizens, which will then increase demand for goods and services in the FDI receiving country positively influencing out in the process.

Chowdhury and Mavrotas (2005) also found a positive association between FDI and economic growth after estimating a single equation and simultaneous equations estimation techniques for 140 countries using macroeconomic data. The findings of their study show FDI being a significant contributor toward positive economic growth but the findings of the significance of economic growth on FDI were not discussed. In addition, Garba (1997) found a positive relationship between FDI and economic growth in Nigeria using data spanning 1970–1994. The findings of the study showed a high coefficient value leading to assumptions that FDI was very sensitive to GDP in that country.

In the context of South Africa, a study by Masipa (2018) using a vector-autoregressive error correction mechanism (VECM) found a positive relationship between FDI and economic growth but the study did not report if there exists a two-way positive relationship between the variables of interest. In addition, Keho (2015) in a study for South Africa concluded that there is a bidirectional relationship between FDI and growth confirming the feedback causality hypothesis. However, Adams (2009) in a study that employed an autoregressive distributive lag (ARDL) approach for South Africa found a negative relationship using data spanning 1990–2003. Most of South Africa studies on the relationship between economic growth and FDI, focuses on the determinants of foreign investment, not the relationship that exists between the two and not on the nature of causality that exists between the two variables of interest (Luiz and Stephan, 2011; Mabule, 2012; Mupimpila and Okurut, 2012; Majaru, 2015; Dondashe and Phiri, 2018; Asangu, 2018; Asiamah *et al.*, 2019).

2.2. NEGATIVE RELATIONSHIP BETWEEN FDI AND GROWTH

According to Agrawal (2005) in an Asian study seeking to understand the nature of the relationship between FDI and economic growth, there is a linkage between FDI and economic growth but the relationship was negative prior to 1980 only to be positive afterward. To add, Durham (2004) could not find a significant positive relationship between economic growth and FDI for 80 countries inclusive of African countries. The scholar argued that the relationship is not always positive as FDI is dependent on the ability of absorption of the host country. On a cross-country analysis to find the relationship that exists between the variables of interest, Devarajan *et al*. (2003) found FDI to have so much influence on overgrowth. The study which was done for a number of African countries concluded that there are no sufficient FDI inflows into Africa to positively influence economic growth.

Duasa (2007) analyzed the relationship in Malaysia and the study did not find strong evidence to support the growth impact of FDI. Also, the study concluded that there is no positive relationship that runs from economic growth influencing positive FDI in Malaysia as well. Confirming the findings of Duasa (2007), Ludoșean (2012) could also not find a positive relation or any causal impact of FDI on economic growth in Romania. However, there is a causal effect that runs from economic growth to positive FDI in Romania (Ludoșean, 2012). Findings from Duasa (2007) and Ludoșean (2012) are in line with what Mutafoglu (2012) also found in the case of Tunisia. Employing the bounds testing approach in an ARDL, the author could not find any

causal relationship between FDI to economic growth in Tunisia. Another, a study by Adams and Opoku (2015) used a General Method of Moments for 22 countries with data spanning 1980–2011 and found that the relationship between FDI and economic growth is nonexistent for sub-Saharan Africa. Last, Agbloyor *et al*. (2015) found a negative effect of FDI on economic growth in 14 African countries including South Africa.

With reference to the above discussion, it can be concluded that the findings are not conclusive when it comes to the impact of FDI on economic growth. Also, most studies focused much on the type of relationship and less on the direction of causality.

3. METHOD(S)

3.1. DATA AND VARIABLE DESCRIPTION

The data this research used were downloaded from World Bank in its raw state. All the variables had data that were starting from 1980 but not all had data beyond 1980; hence, 1980 was chosen to be the starting point. Also, the variables were used as they were except FDI which was converted from net inflow figures into logarithms in an effort to interpret it the same with other variables which were percentages (per capita growth, unemployment, and GDP growth) and indexes (export volume index).

3.2. VARIABLES DESCRIPTION

Gdpgrw- This is the percentage growth rate of the South African GDP on yearly basis. The data were downloaded in percentages from the World Bank.

Evi- This variable is the export value index for South Africa, and it was also accessed from the World Bank as an index of the total value of South Africa's exports from 1980 to 2018.

Lfdi- These were the logged values of the net FDI flows into South Africa from 1980 to 2018.

Pcg- The variable is income per capita growth data from 1980 to 2018. It was included in the analysis to control for the development stage of the economy.

Unemp- This is the unemployment data which is the number of people qualified or willing to work, have looked for work but cannot find employment as a percentage of the total labor force in the country. The unemployment data chosen were the country estimate, not the ILO estimate.

3.3. STATIONARITY OF DATA AND COINTEGRATION OF VARIABLES

The first step when dealing with time series data that we have is to check its stationarity and in this paper, the author employed the augmented Dickey–Fuller. All the variables were subjected to stationarity checks in order for the researcher to see which estimation technique to use and also to see if cointegration tests were necessary to be considered. Using the augmented Dickey–Fuller test equation, the following results presented in the table below were obtained.

Table 1. Stationarity results.

Variable	Stationary in levels (I (0)	Stationary after first difference (I (1)
Gdpgrw	Yes	
Evi		Yes
Lnfdi		Yes
Pcg	Yes	
Unemp		Yes

Source: Author.

The above Table 1 shows that the variables have mixed orders of integration and the implications of that are that we have to check for cointegration and then estimate a model with error correction capabilities.

3.4. COINTEGRATION RESULTS

The cointegration results obtained by the researcher from the Johansen cointegration approach show both the trace and maximum eigenvalue tests confirm at least 2 cointegrating equations among the variables.

3.4.1. JOHANSEN COINTEGRATION TEST RESULTS

Null	Trace statistic	5% C.V	Max eigen	5% C.V
r = 0	152.5993	125.6154	53.84199	46.23142
r <= 1	98.75732	95.75366	36.24792	40.07757
r <= 2	62.50940	69.81889		

Source: Author's calculation.

3.5. ESTIMATION TECHNIQUE

The objective of this paper was to check the nature of causality between economic growth and FDI in South Africa using data spanning 1980–2018. Also, the research answers the question of whether there exists either uni or bidirectional causality between the two main variables something that is not yet known in South Africa at least with recent data. In order to accomplish the specific objective, the study estimated a VECM. The VECM was chosen over the standard VAR mainly because of time series data properties (stationarity) and also the cointegration that exists among the variables involved. To get to answer the research question, Granger causality tests were run from the estimated VECM.

When estimating a VAR–VECM model, the estimation process starts with a reduced form VAR. However, to run and interpret results from a reduced form VAR, the author needs to have all the involved variables to be stationary in their level form, a situation very rare with most time series variables especially with long spans. The VECM estimated by this paper in E-Views follows the stages below:

P^{th} order reduced form VAR

$Y_t = A_1\ Y_{t-1} + ... + A_p\ Y_{t-k} + e_t$

$\boldsymbol{Y_t}$ – nX1 vector of endogenous variables

$\boldsymbol{A_1}$ – the coefficient vector of lagged variables

$\boldsymbol{e_t}$ – the vector of serially uncorrelated reduced form errors with $(e_t\ e_t^{'}) = \sum$

below is the more compact form of the reduced form:

$A(L)\ Y_t = e_t$

$A(L)$ – is the matrix polynomial in the form of a lag operator L

The following stage shows the structural for of a VAR:

$B(L)\ Y_t = u_t$

Therefore $B(L)$ – a p^{th} order matrix polynomial in the lag operator

$B(L) = B_0 + B_1 + B_1L - B_2L^2 - \ldots - B_pL^p$

U_t – nX1 vector of structural innovations, with:

$E(u_t\ u_t') = \Omega$

The following equations show the relationship between the structural and reduced model.

$B_0A(L) = B(L)$

$B_0e = u$

$\sum = (B_0^{-1})\ \Omega\ (B_0^{-1})$

3.5.1. ARDL MODEL

When it comes to the task of establishing the linear relationship between FDI and economic growth, the ARDL was considered to be the best estimation technique, since it accommodates variables of different integration order and also cointegrated variables. The ARDL findings are merely just going to compliment the VECM results since the Granger causality tests are the primary objective of the paper. The model is adapted from the work of Pesaran *et al*. (1996) and the modified version of the previous work by Pesaran and Shin (1999). We decided to use this methodology because (1) no work to the best of our knowledge has used it to investigate this kind of relationship in the case of South Africa and (2) it allows the researcher to model variables that are of different orders of integration meaning that it can mix those variables stationary in their levels I(0) and those stationary after first differencing I(1). The basic ARDL model for cointegration testing that this paper will use is shown below in equation 1.

$$\Delta X_t = \delta_{0i} + \sum_{i=1}^{k} \alpha_i \Delta X_{t-1} + \sum_{i=1}^{k} \alpha_2 \Delta Y_{t-i} + \delta_1 X_{t-1} + \delta_2 Y_{t-1} + V_{it}$$

k is the ARDL model maximum lag order and chosen by the user. The F-statistic is carried out on the joint null hypothesis that the coefficients of the lagged variables ($\delta 1 X_{t-1}\ \delta 1 Y_{t-1}$ or $\delta 1 Y_{t-1}\ \delta 1 X_{t-1}$) are zero. ($\delta_1 - \delta_2$) correspond to the long-run relationship, while ($\alpha_1 - \alpha_2$) represent the short-run dynamics of the model.

The hypothesis that the coefficients of the lag level variables are zero is to be tested.

The null of the nonexistence of the long-run relationship is defined by:

Ho: $\delta_1 = \delta_2 = 0$ (null, i.e., the long-run relationship does not exist)

H1: $\delta_1 \neq \delta_2 \neq 0$ (Alternative, i.e., the long-run relationship exists)

4. PRESENTATION AND DISCUSSION OF RESULTS

This section presents and discusses the main findings and also the complimentary findings of the paper. The Granger causality result from the VECM (main results) will be presented and discussed; first and last, it will be the ARDL results.

Table 2. Pairwise Granger causality test results.

Null hypothesis	F-statistic	Probability
LNFDI does not Granger cause GDPGRW	1.406	0.2598
GDPGRW does not Granger cause LNFDI	0.533	0.5922
UNEMP does not Granger cause GDPGRW	3.486	0.0427
GDPGRW does not Granger cause UNEMP	1.350	0.2736
UNEMP does not Granger cause LNFDI	2.253	0.1215
LNFDI does not Granger cause UNEMP	0.586	0.5624

Source: Author's calculation.

When interpreting the output for Granger causality, the researcher has to use the P-value in order to determine if two variables Granger cause or not. If the P-value is less than 5% or 0.05, the researcher has to reject the null hypothesis. According to statistics presented in Table 2 above, the probability value for causality running from FDI to economic growth (GDPGRW) is above 0.05 (0.2598) meaning we cannot reject the null hypothesis. Failing to reject the null hypothesis means that FDI does not Granger cause economic growth in South Africa. Checking for causality running from economic growth to FDI, the probability value is also above 0.05 (0.5922) meaning that the researcher could not reject the null hypothesis. That means that the researcher could not find evidence of causality running from economic growth to an increase in FDI flows in South Africa. The implications of our findings are that since South Africa's economy has been failing to grow significantly over the past decade that might be the reason why it has been failing to attract sufficient FDI flows to significantly impact economic growth. Despite the country being among the highest recipients of FDI in Africa, the causality of FDI on economic growth could not be found. As for the causality question of FDI and economic growth in South Africa, this paper concludes that there is no either uni or bidirectional causality between FDI and economic growth.

The probability value of causality running from unemployment causing economic growth in South Africa is less than 0.05 (0.0427) meaning that we can reject the null hypothesis. That means that rising unemployment in South Africa is having an impact on weak economic growth patterns the economy has followed. Findings on causality running from economic growth to unemployment are very interesting in that they show that weak economic growth patterns are not significantly causing unemployment in South Africa. Otherwise, the a priori expectation would be to expect weak growth to lead to rising unemployment. The unemployment growth findings might assume that maybe unemployment in South Africa is more structural than anything else. However, that will be another dimension of research of cause worth pursuing to understand how unemployment responds to economic growth in South Africa.

4.1. ARDL ESTIMATION RESULTS

Table 3. ARDL estimation for economic growth and FDI (4,4,0,1).

Variable	Coefficient	Std. error	T-statistic	Probability
D(LNFDI)	-0.008	0.0017	-5.173	0.0001***
PCG	-0.2572	0.1026	-2.507	0.0233**
D(UNEMP)	-0.0026	0.0022	-1.193	0.2503
D(EVI)	0.006	0.0001	3.988	0.0011***
C	0.0113	0.0306	0.371	0.7155

Source: Author's calculation.

*means significant at 10% confidence level; **means significant at 5% confidence level; ***means significant at 1% confidence level

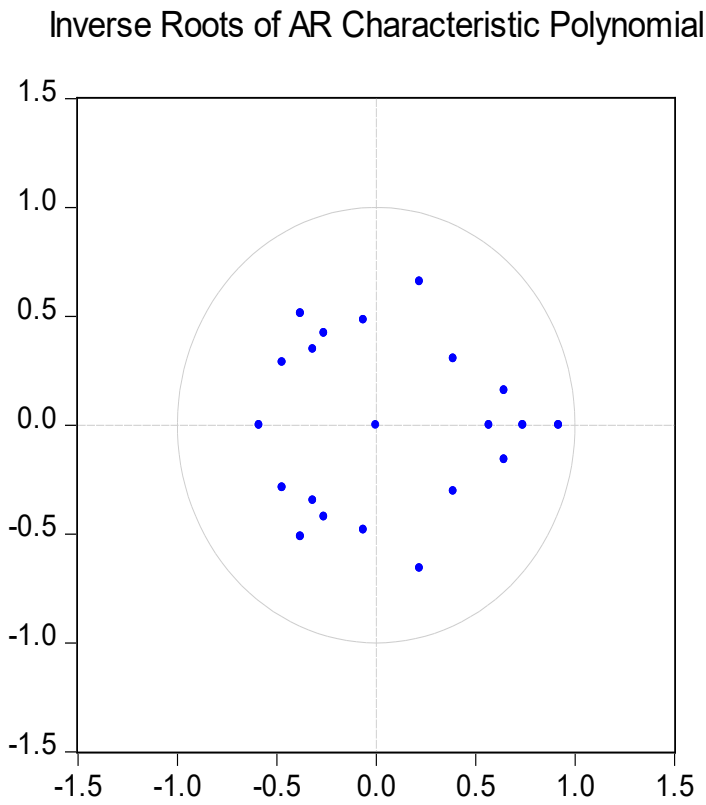
The ARDL model indicates a negative relationship between economic growth and FDI in South Africa. FDI is highly significant at 1% indicating a strong negative relationship with economic growth. The relationship we found might be justified by the fact that foreign investments are driving out domestic investment. The Global Entrepreneurship Monitor (GEM) report of 2017 concluded that more than 60% of SMMs in South Africa were closing down operations before they reach 3 years of operation with more failing before the age of 5 (GEM, 2017; Maduku and Kaseeram, 2019). The negative relationship found in this paper between FDI and growth concurs with findings from (Ludoșean, 2012; Adams and Opoku, 2015; Agbloyor *et al*., 2015). All three studies were carried out as panel studies for African economies with South Africa included. However, research by Keho (2015) for South Africa found an existing bidirectional relationship between growth and FDI. In addition, Masipa (2018) estimated a VECM and reported a positive relationship, and our ARDL findings refute such a conclusion when it comes to the growth FDI question in South Africa.

Other variables in the ARDL model were unemployment, per capita growth, and the export value index. The export value index indicates that there exists a significant positive relationship between exports and economic growth for the period 1980–2018. However, unemployment is showing an unexpected sign but an insignificant relationship with economic growth. This might explain that unemployment in South Africa in as much as is caused by an economy lacking consistent and better growth; there are other factors leading to the unemployment that remain stubbornly high (30% in 1999 and 28.2% in 2020). Last, per capita growth is showing a negative impact on economic growth, and the relationship is significant at 5% level of significance.

4.2. DIAGNOSTIC TESTS

4.2.1. VAR STABILITY TEST

In checking the stability of the model, the study employed the autoregressive roots of the VAR in level form. As the diagram below is showing there are no roots that are lying outside the circle except for a few that are exactly at the circle, the stability of the VAR is confirmed. According to Lutkepohl (1996), if all the roots are inside the circle or if each root has got a modulus that is below one, then it means that all the endogenous variables in the VAR are stationary be it in levels or when they are differenced.



Source: Author's calculation.

5. CONCLUSION

The main research question was interested in finding the nature of causality between economic growth and FDI in South Africa. The Granger causality results did not find either uni or bidirectional causality between the variables of interest (FDI and economic growth). Findings from the two different estimations done gave different results on the relationship between growth and FDI in South Africa. One was a single equation (ARDL) and the other a system of equations (VECM). However, the two estimations had a meeting point on the relationship between unemployment and economic growth. The ARDL findings did not indicate any significant relationship between unemployment and economic growth. The Granger causality tests also could not find any causality running from economic growth to unemployment. However, the fact that there was no causality found and that the relationship is negative means that the country is not receiving enough FDI inflows to significantly impact economic growth in the country.

Policy recommendations arising from our findings are that the government of South Africa may need to consider pursuing inward-looking policies so that the economy can recover to achieve significant levels of FDI flows to impact positively on economic growth. There is enough evidence that FDI follows economies that are prospering already. The fact that China and the United States of America alone received an estimated 75% of the FDI, Africa managed to attract in its entirety might

suggest that FDI follows economic prosperity (Global Finance, 2018). With that said, the South African government should not expect FDI to be a champion of economic growth, but more energy should be put into making sure that small business success is improved so that more production can be realized to facilitate positive and significant economic growth patterns that are able to attract huge volumes of FDI inflows.

CONFLICT OF INTEREST

None.

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