



South Africa's interest rate behaviour: Investigating the influence of the indicators of financial openness

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Abstract

This study seeks to investigate the influence of financial openness variables on South Africa's interest rate during the period between 1980-2020. The study used both Augmented Dickey-Fuller (ADF) and Philip-Perron (PP) tests to determine the order of integration of the variables, while the autoregressive distributed lag (ARDL) bounds test was used to investigate both the short and long-run impact of the independent variables on the dependent variable. The findings of the study revealed that in the short-run both foreign direct investment (FDI) inflows and FDI outflows impacted the interest rate positively. However, portfolio investment, exchange rate and capital account openness did not have any significant impact on interest rate within the duration of this research. The long-run results revealed that FDI inflows had a positive and significant impact on interest rate. Also, while capital account openness had a significant and positive impact on the interest rate, FDI outflows, portfolio investment, and the exchange rate had no significant impact on interest rate. The study concludes that apart from portfolio investment which did not exert significant impact on interest rate, other financial openness indicators used in the study had a significant impact on South Africa's domestic interest rate. The paper argues that, appropriate monetary policy measures targeted to lessen the monetary impact of excess capital inflows should be considered. Additionally, capital account liberalization policy should be encouraged, but it needs to be regulated if it places an excessive amount of liquidity pressure on the economy.

Keywords: Capital flows, FDI, Financial openness, Interest rate.

JEL Classification: E22; E43; E32.

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Contribution of this paper to the literature

This study contributes to the existing literature by focusing on the influence of financial indicators on South Africa's interest rate instead of examining the impact of financial indicators on gross domestic product (GDP) or the impact of interest rate on some financial openness indicators.

1. Background to the Study

Monetary policy authorities keep an eye on interest rate movement. This is because interest rate affects macroeconomic variables such as money supply, savings, and investment. For instance, a rise in interest rate encourages savings which improves loanable funds and ultimately increases the level of investment. However, rising interest rate also has the tendency to retard investment as it raises the cost of borrowing. In another angle, if interest rate rises, deposit money banks will have the urge to extend more credit to the private sector which is capable of raising the level of inflation in the economy. The aforementioned scenario highlights the significant impact on the economy of interest rates, demonstrating the necessity to investigate those factors that determine interest rates.

Financial openness has been accepted as a significant element in influencing domestic interest rate and other macroeconomic variables. This phenomenon is increasingly apparent, as numerous economies have abandoned the practice of financial repression and instead adopted policies of financial liberalization. Sulaiman, Oke, and Azeez (2012) argued that in many developing nations, financial repression was the norm until the transition to financial liberalization occurred. Financial repression introduces regulations that lower interest rates, leading to lower savings and declining investment (McKinnon, 1973). The nexus is an area between financial openness and interest rate that has diverse interpretations. For instance, if an economy's financial sector is liberalized, a high interest rate can encourage more capital inflows, while a low interest rate can retard capital inflows. In fact, if the domestic interest rate is lower than the foreign interest rate, this encourages arbitrage in foreign and domestic interest rates, resulting in capital outflows (Bacchetta, 1992). This development induces domestic currency depreciation and reduces liquidity in the economy. On the other hand, financial openness influences domestic interest rate in some ways. In periods of rising capital inflows, there is always a growth in monetary aggregate as the inflows introduce liquidity in the system that ends up lowering the domestic interest rate. However, Aslanoğlu (2012) observed that as a way to avoid the appreciation of domestic currency occasioned by rising portfolio investments, the monetary authorities could use open market operations (OMO) to sterilize the inflows, leading to a fall in money supply and thus a rise in domestic interest rate. The foregoing brief scenario indicates that financial openness could either raise interest rate or reduce it.

Therefore, this study is an attempt to determine the impact of financial openness on interest rate in South Africa. Just like other developing countries, the objective of major monetary policy of South Africa which is the responsibility of the South African Reserve Bank (SARB) is to maintain price stability (Van Der Merwe & Mollentze, 2010). This objective is pursued through the Inflation Targeting Framework (ITF) approach. As observed by Arestis and Sawyer (2003), in order to achieve price stability under the ITF, the major monetary policy tool is the short-term interest rate (or repo rate). Accordingly, the ITF is implemented through the estimation of a targeted inflation range and then an attempt is made to steer actual inflation towards the target using repo rate. The view of present study is to explore the factors that may influence interest rate. The findings of this study may offer valuable guidance to the (SARB) in its endeavours to utilize interest rates as a tool for attaining price stability.

This study becomes necessary as past empirical efforts were focused mainly on the influence of financial openness on economic growth. Other previous studies equally dwelt on the impact of interest rate on financial openness. The studies did not address the indirect nature of the relationship between financial openness and economic growth, as financial openness must first affect intermediary variables such as interest rates before impacting economic growth. Previous studies did not consider the bidirectional relationship between financial openness and interest rate, as the causality may not solely run from interest rate to financial openness. For instance, other than domestic interest rate, factors such as friendly business environment could stimulate foreign investments into an economy. If so, it is necessary to assess how these influxes will affect the domestic interest rate.

1.1. Stylized Facts

Evidence in Figure 1 shows that between 1980 and 1991 FDI outflows and inflows trended very low such that in 1985 FDI inflows trended negatively. However, beginning from 1992, both variables experienced rising trend, but in 2001 FDI outflows declined heavily. However, in the same year, FDI inflows trended very high. Between 2008 and 2012, it is also found that FDI outflows experienced declining trend, while within similar period FDI inflows trended high. Evidence of the trend in the FDI flows indicated that prior to 1994 when the Apartheid regime ended in South Africa, financial repression was in practice that led to a very low FDI flows. As observed by Mowatt (2001) in the late eighties and nineties, most Southern African development community (SADC) countries reformed their financial system. The study noted that before these reforms, governments of these countries were within the boundaries of the financial systems.

In Figure 2, it is revealed that the trend of real interest rate exhibited much volatility within the research period. Evidence shows that with the exception of 1983, 1986 and 1993 when the annual changes in real interest rate was relatively low, other years showed that movement in the variable was high as it got to a peak in 1998. From 1995 to the entire research period the variable assumed positive trend. The behaviour of interest rate within these periods does not rule out the possible impact of financial repression on interest rate prior to 1991. It is also revealed from the trend that interest rate trended upwards in 2008 but descended sharply in 2009 and behaved sluggishly thereafter. According to this study, the circumstances leading up to and following the global financial crisis must have influenced the trend of the variable during these times.

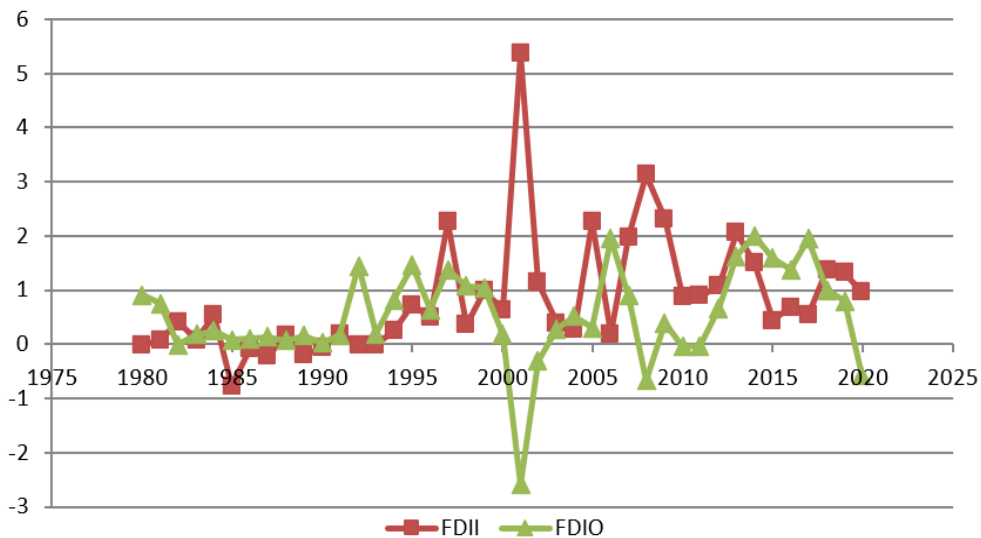


Figure 1. Trend in FDI and FDI O.

Note: FDI - Foreign direct investment inflows, FDI O - Foreign direct investment outflows.

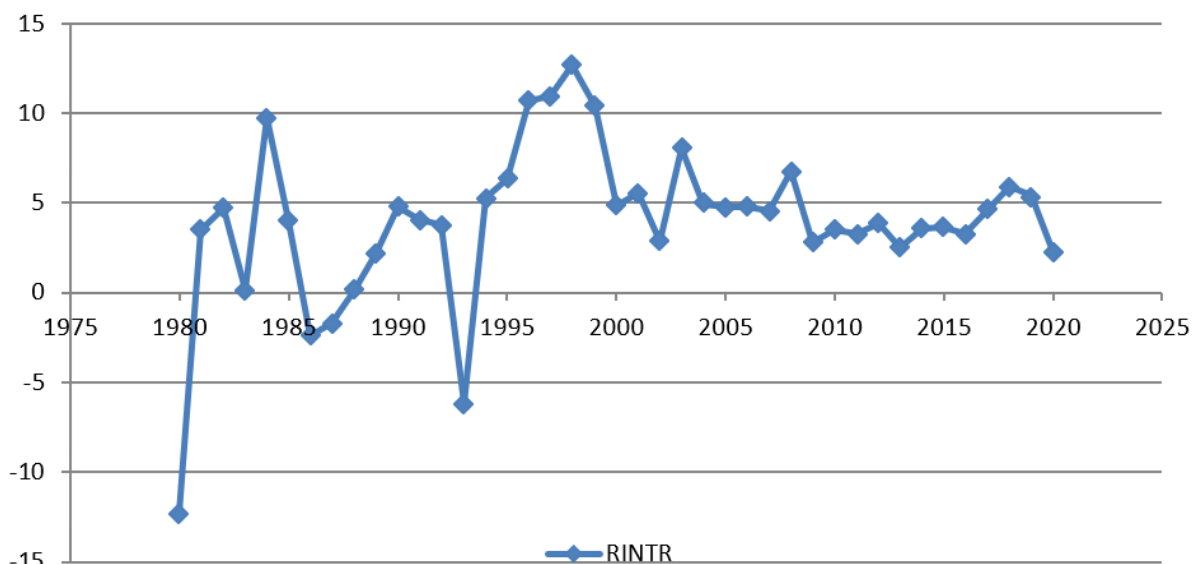


Figure 2. Trend of real interest rate.

Note: RINTR - Real interest rate.

1.2. Theoretical Background

Theoretical issues have been advanced by some scholars on the role of financial openness on the economy. For instance, the impact of real interest rate on investment was studied by Jorgenson (1963). The study observed that the desired stock of capital depends on the opportunity cost of capital as well as real output. The conclusion drawn by the study was that when the desired capital stock has a positive relationship with output, its link with the cost of capital was negative. Consequently, if real interest rate falls, there will be a fall in the opportunity cost of capital, but the desired capital stock and investment will be raised. In a similar spirit, Shaw (1973) argued that financial liberalization can enhance investment, hence it increases productivity, but financial repression can impair both the quantity and quality of overall investment. Accordingly, while regulation of interest rate through financial repression lowers interest rate, this can lead to lower savings and declining investment. On the other hand, interest rate deregulation encourages savings and investment and this has the tendency to improve the economy. From another perspective, Bacchetta (1992) noted that financial liberalization enhances capital inflows with the tendency to improve capital stock. As domestic interest rate rises, capital inflows are attracted to the domestic economy which leads to domestic currency appreciation. However, the fall in domestic interest rate encourages arbitrage in foreign and domestic interest rates, leading to capital outflows and consequently domestic currency depreciation. Levine (2001) observed that through financial openness, domestic financial system is developed which raises domestic investment and the allocation of capital. In their separate views, Beju and Ciupac-Ulici (2012) and Hamdi and Jlassi (2014) contended that capital account liberalization reduces the probability of financial crises through the provision of liquidity in the banking system as capital inflows increase. Despite the positive role of financial openness, concerns have been raised about the possibility of financial openness of the economy. Stiglitz (2000) contends that financial openness does not guarantee welfare. This view is informed by the inherent distortions in most of the economies such as weak institutions, trade barriers and imbalances in the economy.

2. Empirical Literature Review

In literature, studies have shown the impact of financial openness on some macroeconomic variables in both country-specific and cross-country studies. It is sufficient to say that a preponderance of these studies focused mainly on the impact of financial openness on economic growth. For country-specific studies, Sulaiman et al. (2012) revealed that financial openness improved economic growth in Nigeria. This result was corroborated with a study by Anthony, Ogbuabor, and Anthony-Orji (2015) which observed that financial liberalization and private investment had positive and significant impact on economic growth in Nigeria. However, Saifullahi and Nuruddeen (2015) revealed that a negative relationship existed between real gross domestic product (GDP) and financial openness in Nigeria. In another research by, Ajogbeje, Adeniyi, and Egwaikhide (2018) showed that capital mobility impacted significantly on interest rate in the long-run in Nigeria, while monetary independence and exchange rate stability had no impact on interest rate. In support of the impact of financial openness on economic

growth, Fasanya and Olayemi (2020) revealed that a strong link exists between financial openness and economic growth in Nigeria.

In studies that focused on cross-country, Wei (2014) showed that while *de jure* measures of financial openness adversely impacted on economic growth in the Asian countries, the impact of *de facto* measures was positive. In sub-Saharan African countries, Tajudeen, Olusola, and Ademola (2017) revealed that trade openness and price stability were the relevant factors for interest rate liberalization. In another study for Sub-Saharan African (SSA) countries, Aremo and Arambada (2021) revealed that trade openness impacted positively and significantly the economic growth in low income countries, however, the impact of financial openness and the joint trade was not significantly positive. For middle-income countries, findings showed that both financial openness and the joint trade were not encouraged for economic growth. In a study for 35 developed and emerging countries, Aman, Granville, Mallick, and Nemlioglu (2022) found that financial openness alone could not improve export competitiveness, but the inclusion of greater trade openness. A study involving the Asian Tigers and the South Africa, Algeria, Nigeria and Egypt (SANE) countries by, Nzeh, Ogwuru, Izuogu, and Ogaraku (2023) revealed that capital account openness, FDI outflows, FDI inflows and governance effectiveness improved the GDP per capita significantly in the Asian Tigers. The study equally found that for SANE countries, FDI inflows and trade openness had positive impact on GDP per capita, while the impact of capital account openness was negative and significant. Moyo and Le Roux (2019) found that financial liberalization reduced the probability of financial crisis in Southern African Development Community (SADC), while financial development raised the incidence of financial crisis. In a study that involved African countries, Ali (2022) revealed that financial liberalization did not have significant impact on economic growth, while total labour force participation, political stability, presence of physical capital and government effectiveness had significant positive impact on economic growth in the selected countries. Effiong and Asuquo (2022) discovered that financial openness had a diminishing impact on remittances, but that it had little bearing on how deeply they permeated the region.

3. Data and Methodology

This study used annual series spanning the period from 1980-2020 to examine the impact of the indicators of financial openness on interest rate in South Africa. The proxy for interest rate is real interest rate. The indicators of financial openness are split into *de facto* and *de jure* measures. The three *de facto* indicators used in the study are: portfolio investment, foreign direct investment outflows and foreign direct investment inflows. However, the *de jure* indicator included in the study is capital account openness (CAO) index introduced by Chinn and Ito (2006). A control variable included in the study is exchange rate. Real interest rate is measured as the lending rate adjusted for inflation, while foreign direct investment inflows and outflows are measured as net inflows (% of GDP) and net outflows (% of GDP), respectively. Additionally, actual exchange rate is calculated using 2010 as the base year, even though portfolio investment is calculated as net balance of payment in current US dollars. Data on other variables were obtained from the World Bank Development Indicators, with the exception of data on capital account openness which was obtained from Chinn and Ito (2006). In order to test for the stationarity of the series, the study used both the augmented Dickey Fuller (ADF) and the Phillip-Perron (PP) unit root tests. After ascertaining the order of integration of the series, the study examined the long-run (cointegration) relationship among the variables using the ARDL. The ARDL was also used to investigate both the short-run and the long-run impact.

3.1. Model Specification

This study employed the ARDL bounds test by Pesaran, Shin, and Smith (2001) to examine the long-run relationship among the variables. The ARDL model also assisted the model to determine both the short run and the long run impact. A major strength of the ARDL model is that it can be applied even when the variables are integrated in order zero or one or a combination of order zero and one. From the ARDL model a dynamic error correction model (ECM) can be derived. Consequently, the following ARDL model that links interest rate to the indicators of financial openness guided this study:

$$\begin{aligned} \Delta RINTR_i = & \gamma_0 + \sum_{i=1}^p \gamma_1 \Delta RINTR_{t-i} + \sum_{i=0}^p \gamma_2 \Delta FDII_{t-1} + \sum_{i=0}^p \gamma_3 \Delta FDIO_{t-i} + \sum_{i=0}^p \gamma_4 \Delta PI_{t-i} \\ & + \sum_{i=0}^p \gamma_5 \Delta KAOPEN_{e-1} + \sum_{i=0}^p \gamma_6 \Delta REXCHR_{t-i} + \gamma_7 RINTR_{i-1} + \gamma_8 FDII_{t-1} + \\ & \gamma_9 FDIO_{t-1} + \lambda_{10} PI_{t-1} + \gamma_{11} KAOPEN_{t-1} + \gamma_{12} REXCHR_{t-1} + \varepsilon_t \end{aligned} \quad (1)$$

Where $RINTR$ = real interest rate (a proxy for domestic interest rate), $FDII$ = foreign direct investment inflows, $FDIO$ = foreign direct investment outflows, PI = portfolio investment, $KAOPEN$ = capital account openness and $REXCHR$ = real exchange rate. In Equation 1, $\gamma_1, \gamma_2, \gamma_3, \gamma_4, \gamma_5$ and γ_6 are the short-run parameter coefficients. However, $\gamma_7, \gamma_8, \gamma_9, \gamma_{10}, \gamma_{11}$ and γ_{12} are the long-run parameter coefficients. To test for the presence of a long-run relationship, the study compared the computed F-statistic with the critical bounds. The critical bounds are the upper critical bound $I(1)$ and the lower critical bound $I(0)$. If the computed F-statistic is higher than the upper critical bound, the variables are considered to be in a long-term association. On the other hand, there is no presence of a long-run relationship if the computed F-statistic is lower than the critical bound. If the presence of a long-run relationship is established, then the ECM is specified as follows:

$$\Delta RINTR_i = \gamma_0 + \sum_{i=1}^p \gamma_1 \Delta RINTR_{t-i} + \sum_{i=0}^p \gamma_2 \Delta FDII_{t-i} + \sum_{i=0}^p \gamma_3 \Delta FDIO_{t-i} + \sum_{i=0}^p \gamma_4 \Delta PI_{t-i} + \sum_{i=0}^p \gamma_5 \Delta KAOPEN_{t-i} + \sum_{i=0}^p \gamma_6 \Delta REXCHR_{t-i} + \eta ECM + \ell_t. \tag{2}$$

Where η represents the coefficient of the ECM.

4. Results Presentation and Discussion of Findings

In Table 1, the results of ADF unit root revealed that all the variables achieved stationarity at level, except exchange rate that achieved stationarity at first difference. However, results of the PP unit root test in Table 2 showed that exchange rate and capital account openness achieved stationarity at first difference, while others achieved stationarity at level. It should be noted that a variable achieves stationarity at level if the statistical properties of such variable such as the mean and variance are constant without first transforming the variable. The variables displayed a confluence of I(0) and I(1), implying that the ARDL model is appropriate.

Table 1. Results of Augmented Dickey-Fuller (ADF) unit root.

Variable	ADF level t-stat	ADF level critical value at 5%	ADF first diff. t-stat	ADF first diff. critical value at 5%	Order of integration
RINTR	-5.80	-2.93	-9.07	-2.93	I(0)
EXCHR	-1.61	-2.93	-5.56	-2.93	I(1)
FDII	-4.70	-2.93	-7.93	-2.94	I(0)
FDIO	-3.79	-2.93	-7.54	-2.93	I(0)
KAOPEN	-3.68	-2.94	-5.12	-2.94	I(0)
PI	-4.10	-2.93	-6.98	-2.94	I(0)

Table 2. Results of PP unit root.

Variable	PP level t-stat	PP level critical value at 5%	PP first diff. t-stat	PP first diff. critical value at 5%	Order of integration
RINTR	-5.72	-2.93	-16.78	-2.93	I(0)
EXCHR	-1.48	-2.93	-6.24	-2.93	I(1)
FDII	-4.67	-2.93	-18.46	-2.93	I(0)
FDIO	-3.81	-2.93	-7.74	-2.93	I(0)
KAOPEN	-2.48	-2.93	-7.23	-2.94	I(1)
PI	-4.17	-2.93	-10.09	-2.93	I(0)

With the results of stationarity indicating the variables have an admixture of I(0) and I(1), the study estimated the long-run relationship among the variables. Result in Table 3 indicated that the value of F-statistic (8.6) is higher than the upper critical bound (3.79) at the 5% level of significance. Thus, the study concludes that the variables have a long-run relationship or are cointegrated.

Table 3. ARDL bounds test result.

Test statistic	Value	K
F-statistic	8.603	5
Critical value bounds		
Significance	I0 bound	I1 bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

After confirming the cointegration of the series, the investigation assessed the effects of financial openness indicators on interest rates in both the short and long term. The short-run results in Table 4 indicated that FDI inflows impacted positively on interest rate and the results were significant. If FDI inflows rose by one unit, interest rate rose by 1.1 percent. Ordinarily, FDI inflows is expected to depress domestic interest rate as it leads to increase in monetary aggregates. A possible explanation for the outcome may be attributed to the influence of the monetary policy intervention that was executed to alleviate the surplus liquidity generated by the inflows. The effect of such policy intervention, such as the open market operation (OMO) is to reduce money supply, hence it results in raising domestic interest rate. In another vein, FDI outflows was found to impact positively and significantly on interest rate. One unit rise in FDI outflows led to an increase in interest rate by 1.63 percent. The short run findings also showed that portfolio investment, exchange rate and capital account openness did not have any significant impact on interest rate within the study period. The coefficient of the ECM is negative and significant which gives credence to the cointegration result. The system is observed to be in equilibrium subsequent to a deviation by 81%.

The results in Table 5 revealed that FDI inflows had a positive and significant impact on interest rate. This finding is relevant to the result of the impact of FDI inflows on interest rate in the short-run. The result indicates that if FDI inflows rose by one unit, interest rate rose by 1.35%. The obtained outcome is incongruous with the anticipated outcome based on prior knowledge, as it is commonly assumed that Foreign Direct Investment (FDI) inflows would lead to a decrease in interest rates by means of an increase in monetary aggregates. Findings of the study also indicated that FDI outflows, portfolio investment and exchange rate had no significant impact on interest rate in the long-run. However, capital account openness had a significant and positive impact on interest rate. If capital account openness rose by one unit, interest rate rose by 3.29%. The degree of capital account openness has an impact on interest rates, which can be either positive or negative depending on the direction of inflows associated with such policy. For instance, if the liberalization of the capital account is associated with an

increase in capital inflows, this, in turn, may lead to a reduction in interest rates due to the positive impact of the inflows on the money supply. However, if it leads to more capital outflows, interest rate may be reduced.

Table 4. Results of short-run ARDL.

Short run results				
Variable	Coefficient	Std. error	T-statistic	Prob
FDII	1.10	0.58	1.88	0.06
FDIO	1.63	0.93	1.74	0.09
PI	0.00	0.00	0.94	0.35
KAOPEN	-2.81	1.73	-1.62	0.11
EXCHR	0.03	0.02	1.44	0.15
ECM(-1)	-0.81	0.11	-6.84	0.00

Table 5. Results of long-run ARDL.

Long run results				
Variable	Coefficient	Std. error	T-statistic	Prob
FDII	1.35	0.73	1.82	0.07
FDIO	2.01	1.19	1.68	0.10
PI	0.00	0.00	0.93	0.35
KAOPEN	3.29	1.72	1.91	0.06
EXCHR	0.04	0.03	1.35	0.18
C	2.68	4.67	0.57	0.57

5. Discussion of Findings

The results of this study indicated that in the short-run both FDI inflows and outflows influenced domestic interest rate positively within the research duration. However, the long-run results showed that both FDI inflows and capital account openness had positive and significant impact on domestic interest rate. The study did not find portfolio investment to impact domestic interest rate significantly either in the short-run or in the long-run. These findings have some policies relevant to monetary policy management in the country. The positive impact of FDI inflows in both the short-run and the long-run is an indication that even as the inflows increased money supply within the study period which should lower domestic interest rate, the monetary policy action taken to insulate the domestic economy from overheating led to rise in domestic interest rate. In another vein, the short-run positive impact of FDI outflows on domestic interest rate aligns with prior expectation. FDI outflows are expected to reduce money supply which should raise domestic interest rate. Portfolio investment was not found to exhibit any significant impact on domestic interest rate which is an indication that the capital market in the country is not deeply developed. Regarding the favourable enduring influence of capital account openness on domestic interest rate, the research posits that a conceivable explanation for this result is that the policy of capital account liberalization drew a significant influx of capital into the economy over an extended period, thereby causing an increase in domestic interest rates. This result finds support in [Ajogbeje et al. \(2018\)](#) which revealed that capital mobility had significant impact on interest rate in the long-run in Nigeria.

The post-diagnostic results in [Table 6](#) revealed that there is no heteroskedasticity in the model. Also, the model is free from serial correlation just as it is well specified. In [Figure 3](#), the result of the Jarque-Berra test for normality indicated that the errors are normally distributed at the significant level of 5%. In [Figure 4](#) and [5](#) the results of the CUMSUM and CUMSUM of squares revealed that the model is stable since the plots fall inside the critical bands of the 5% confidence interval of parameter stability.

Table 6. Post diagnostic results.

Test	P-value	Null hypothesis	Conclusion
Heteroskedasticity test: Breusch-Pagan-Godfrey	0.32	Ho: No homoscedasticity	Cannot reject Ho
Serial correlation: Breusch-Godfrey LM test	0.98	Ho: No serial correlation	Cannot reject Ho
Model specification (Ramsey RESET test)	0.13	Ho: Correctly specified	Cannot reject Ho

Note: LM – Langle multiplier, RESET – Ramsey regression equation specification error test.

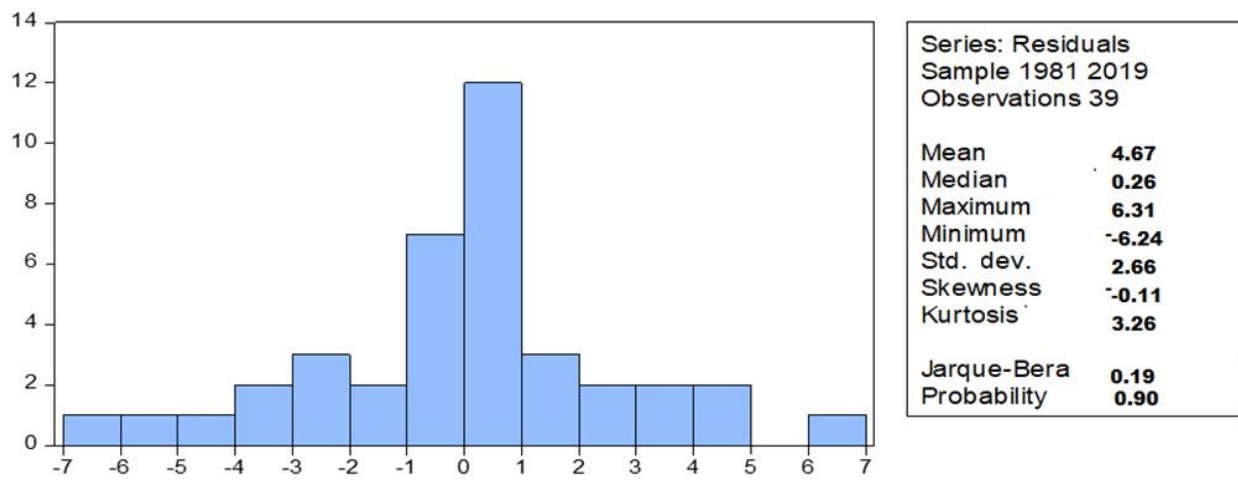


Figure 3. Plot of the normality of the error term.

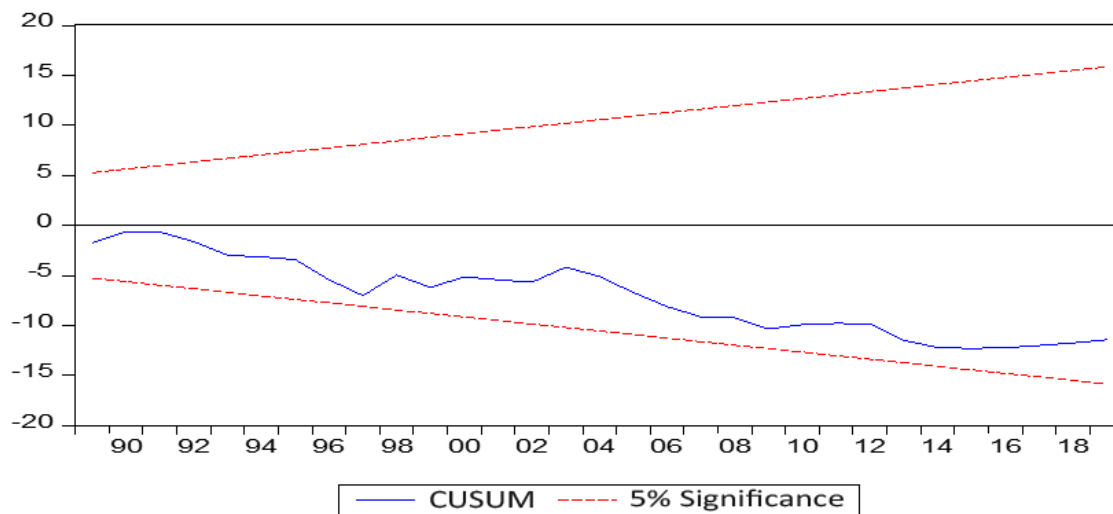


Figure 4. Plot of cumulative sum (CUSUM).

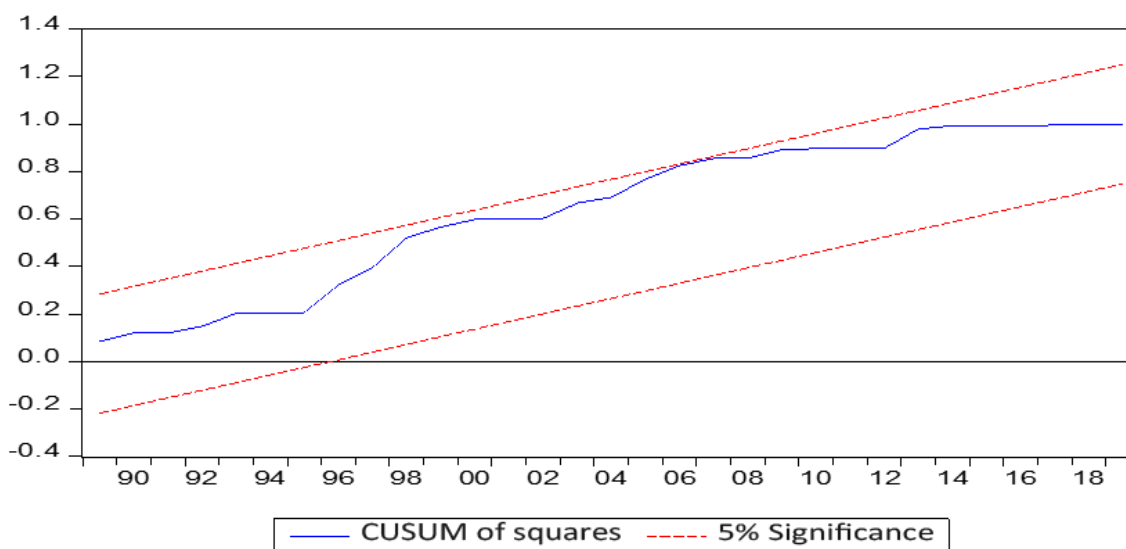


Figure 5. Plot of CUSUM of square.

6. Conclusion and Recommendations

The sensitivity of interest rate in macroeconomic variables has attracted research interests on the factors that determine it. This present study examined the influence of the indicators of financial openness on interest rate in South Africa over the period from 1980 to 2020. The findings of this study revealed some outcomes that are germane for policy formulation in the country. As argued earlier, the positive impact of FDI inflows implies that the monetary policy actions designed to reduce the impact of such inflows were effective in raising interest rate. However, the short-run positive impact of FDI outflows on interest rate indicates that such outflows drained liquidity in the system, thus transmitting into an increased interest rate. The paper also argues that the fact that capital account liberalization brought more money into the domestic economy during the study period and raised interest rates is evidence of the long-term beneficial influence of capital account openness on interest rates. Also, that portfolio investment did not influence interest rate significantly in any of the time horizons is evidence that the capital market in the country may not have been developed to the extent of attracting enough capital that is capable of influencing the interest rate. Consequently, the study recommends that in periods of rising FDI inflows, the monetary authorities should employ appropriate monetary policy measures targeted at reducing the monetary impact of the inflows. However, such measures should not be jeopardized domestic investment through unduly rising in the cost of capital (interest rate). In another vein, even though low domestic interest rate is expected to boost domestic investment, caution needs to be exercised in maintaining such low level of interest rate to avoid arbitrage practices by investors which could distort the achievement of monetary policy objectives. Finally, the paper argues that while capital account liberalization policy should be supported, it needs to be controlled if it places an excessive amount of liquidity pressure on the economy and causes interest rates to drop significantly.

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