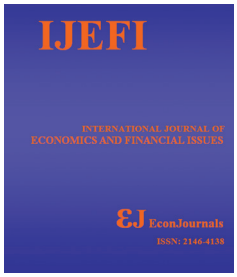

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Macroeconomic Impacts of FDI Inflows: An Empirical Analysis from South Africa

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ABSTRACT

This study evaluates macroeconomic impacts of FDI inflows on South Africa (SA) economy. The study employed Johansen cointegration test, block exogeneity test and vector error correction model (VECM) to evaluate the variables spanning over 1986-2021. It has been demonstrated that there is a unidirectional causal relationship between export and economic growth, an increase in exports (EXP) causes a rise in SA's economic growth. Economic growth and REXR were found to be causally related, indicating that higher real exchange rate (REXR) values correspond to higher economic growth. Moreover, there is no correlation between FDI inflows and economic expansion. On the other hand, looking at the non-significant levels between External debt (EXTD) and CGDP indicates that the stock of external debt does not drive growth in SA. The study recommends a standardized export agency should be established to oversee the exportable units, their quality, and the standardization of goods and services, necessitating the implementation of an efficient export policy.

Keywords: FDI, External Debt, Real Exchange Rate, Export, South Africa
JEL Classifications: F3, F4, G1, F1

1. INTRODUCTION

In any nation, foreign direct investment (FDI) is vital in encouraging sustainable emancipation of the economy. FDI is clearly the main factor advancing the development of the recipient country as global economic integration increases. This capital inflow not only gives developing nations much-needed financial resources, but it also makes it easier to transmit managerial know-how and technological innovations. As a result, there is increased rivalry for FDI from both rich and emerging nations, prompting governments to provide investors with a range of incentives. Usually, fiscal measures like loosened repatriation rules and lower tax rates for foreign investors serve as these incentives. Furthermore, the supply of infrastructure becomes a crucial element in drawing in foreign investors, leading governments to commit large sums of money to support their economies (Pea-Assounga et al., 2025; Voumik et al., 2023).

Fundamentally, as financial and economic interconnectedness between rich and developing nations has grown, FDI has come to play a bigger role in global trade. This in turn is the outcome of other variables, including the spread of institutional investors, economic liberalization and information technology advancement. Compared to foreign portfolio investment, foreign direct investment (FDI) flows are favored by developing nations because they are thought to have a favorable effect on a variety of macroeconomic indicators, including exports and GDP. However, an increase or decrease in international investment flows can make aggregate economic management and the foundations of a nation more difficult to understand. The host nation may face financial and economic risks as a result of this (Ganić, 2025; Maza and Hierro, 2025)

A spike could result in the appreciation or depreciation of the currency rate and/or reduce the local tradable sector's competitiveness, thereby causing long-term harm (with serious

negative impacts in the event of a quick reversal). Research on developing nations demonstrates that foreign direct investment (FDI) is essential to the nation's long-term economic growth by increasing the country's access to capital, bolstering its infrastructure, transferring technology, and creating new job opportunities all of which increase the domestic competitiveness of a country and its production (Bhujabal et al., 2024; Balasubramanyam et al., 1996; Basu et al., 2003; Bhasin, 2012; Chowdhury and Mavrotas, 2005; Hansen and Rand, 2006; Jajri, 2009; Kumar and Pradhan, 2002; Makki and Somwaru, 2004; Xuan, 2025). There is a chance that it will undermine domestic capacities, take advantage of the resources of the host nation, or take an unbiased stance (Carkovic and Levine, 2002; De Mello and Fukasaku, 2000; Johnson, 2006). Initial economic reforms were started at this point, and in the years that followed, the economy was gradually opened up to foreign investment and commerce. Recently SA foreign direct investment inflows are improving gradually.

Given the perceived significance of foreign direct investment (FDI) inflows for developing economies such as India, it is even more critical to determine whether the increasing FDI inflows are genuinely given stated appropriate expectation on key macroeconomic indicators like CGDP, EXP and REXR. In this research, the study employed the robust VECM technique to investigate the link amid significant macroeconomic indicators, including CGDP, EXP, and REXR, and the inflows of FDI into SA throughout the period of 1986-2021.

2. LITERATURE REVIEW

Both theoretical and empirical literature adequately address the macroeconomic effects of FDI inflows on economic growth. Nevertheless, the results are largely equivocal. There is evidence from earlier research that FDI inflows have a mixed impact on economic growth. Numerous studies have revealed unfavorable connection between FDI inflows and economic growth, despite some finding a favorable correlation. Furthermore, a weak or negligible connection has also been documented by another research. The connection among FDI inflows and outflows and specific variables like GDP or exports has been the subject of extensive research (Bhasin and Paul, 2016; Chowdhury and Mavrotas, 2005; Johansen and Juselius, 2006; Johnson, 2006; Kumar and Pradhan, 2002). The majority of previous research, both theoretical and empirical, focused on how FDI inflows might help the recipient country thrive. The great effect of FDI on Gross domestic product appears to gain status of adapted reality in the global financial aspects writing, note (Campos and Kinoshita, 2002).

There is a good quantity of literature that uses various research approaches to look at the connection between FDI inflows and CGDP and the links between growth and exports. The reviews of the literature have been separated into various subsections, such as studies on developing countries, studies about SA, and studies about both developed and developing nations. The study also examines the connection amid FDI inflows and EXR as well as research looking at the connection amongst FDI inflows and CGDP as well as EXP. The analysis of the literature also reveals that not much research has been conducted regarding the dynamics of the connection amid the EXR and other macroeconomic variables or FDI inflows.

Researchers have found that nations with stronger legal systems, better governance infrastructure, and high rankings across a range of macroeconomic indices typically see a large rise in FDI inflows. A detailed discussion is given to a few of these investigations (Globerman and Shapiro, 2002). Analyzed the effect of governance on FDI in 144 industrialized and developing nations between 1995 and 1997. They came to the conclusion that FDI inflows and outflows are significantly influenced by the governance infrastructure, which consists of legal, political, and economic growth (Jakobsen and De Soysa, 2006). Examined, from 1984 to 2004, the effect of democracy on FDI inflows into a sample of 98 developing nations.

According to their research, FDI inflows were greater in democratic evolving nations with stronger economic growth. Hyun (2006) discovered a long-term, bidirectionally cointegrating association amid FDI and GDP in their evaluation, which covered 62 developing nations between 1984 and 2003 (Benassy-Quere et al., 2007) studied the connection between GDP and FDI inflows for a sample of 52 countries between 1985 and 2000, and found that institutional quality has a significant role in FDI inflows. (Busse and Hefeker, 2007) studied a sample of 83 nations between 1984 and 2003 and came to the conclusion that favorable institutional conditions and political stability had a beneficial impact on FDI inflows. Refs. (Assunçao et al., 2011; Jensen et al., 2012; Saidi et al., 2012) reported similar findings. Mina, 2013 study for Arab economies, FDI inflows can rise when government stability and investment risk are reduced. In a similar vein, (Lysandrou et al., 2016) looked at 52 nations between 2006 and 2012 and discovered that FDI inflows are positively impacted by favorable public and private governance systems.

3. METHODS

The most significant characteristics that are influenced by foreign direct investment inflows and influence foreign investors' decisions to make investments in South African markets have been included in this study. As a result, the study looks at the connection amid FDI inflows, CGDP, EXP, EXTD and REXR from 1986 to 2021. The World Development Indicator Database provided information for the variables that were used (WDI, 2021). The Granger Causality Test and the more modern and reliable VECM are used in the study to investigate the relationship between variables. The traditional cointegration method, as used by Johansen and Juselius (1990), calculates long-term associations in the framework of an equation system.

There is just one reduced form of equation used in the VECM approach. Additionally, as this method involves pre-testing variables, it is crucial to determine if the underlying regressors are pure I(0), pure I(1), or a combination of the two. It is important to exercise caution when using VECM since variables of type I(2) should not be used as this could produce erroneous results.

Furthermore, the VECM model eliminates the need for a great deal of specification, including the amount of exogenous and endogenous variables (if any), how deterministic elements are handled, and the ideal sequence in which to employ lags. More significantly, the VECM method is proven to offer more consistent and dependable results when using sample sizes that are dependable.

$$GDP = f(EXTD, EXP, FDI, EXR) \quad (1)$$

Where
GDP =Change in gross domestic product
EXTD = External debt stocks, total (DOD, current US$)
EXP = Export
FDI =Foreign direct investment net inflow
EXR =Real exchange rate

The econometric specification of the model is specified below:

$$GDP = EXTD + EXP + FDI + EXR \quad (2)$$

$$GDP = \beta_0 + \beta_1 EXTD + \beta_2 EXP + \beta_3 FDI + \beta_4 EXR \quad (3)$$

$$GDP = \beta_0 + \beta_1 EXTD + \beta_2 EXP + \beta_3 FDI + \beta_4 EXR + \varkappa \quad (4)$$

$$GDP = \beta_0 + \beta_1 EXTD + \beta_2 EXP + \beta_3 FDI + \beta_4 EXR + \hat{e} \quad (5)$$

GDP is the endogenous variable while EXR, FDI, EXP and EXTD are the exogenous variables. Equation (5) is modelled to show the connection amid GDP and other specified variables in South Africa (SA). $\beta_0 - \beta_4$ are the parameters to be estimated in the model.

4. FINDINGS AND DISCUSSION

Table 1 below presents the unit root test which denotes I(0) and I(1) which serve as indicator for applicability of VECM for the study; the Schwarz information criteria is used to determine the optimal lag selection, which is based at 2 (Table 2).

4.1. Cointegration Test

Johansen Cointegration Test (JCT) is used in the analysis to assess the long-term association amid the variables. The JCT (1999) technique is simple to register for such frameworks and provides the best likelihood of robust application of VECM. Table 3 shows the JCT results.

The short-run relationship that is, to check whether or not the variables have a meaningful relationship in the short run which can be found using the error correction model (ECM). However, the long-run adjustment shows whether or not the model can adapt to a long-run equilibrium following a shock. To find a relationship

Table 1: Unit root testing

Variables	DF Null (H_0): Non-stationary				ADF Null (H_0): Non-stationary			
	ERS_α				DF_α			
$z_{.t}$	$\tau_{.\mu}$	1%	5%	Probability	τ_τ	1%	5%	Probability
Intercept without Time Trend								
CGDP	3.65	2.63	1.95	0.00	4.26	3.63	2.94	0.00
EXP	1.97	2.63	1.95	0.00	2.02	3.63	2.95	0.27
EXTD	1.40	2.63	1.95	0.17	1.37	3.63	2.95	0.99
RER	2.20	2.63	1.95	0.03	4.15	3.63	2.95	0.00
FDI	2.64	2.63	1.95	0.00	2.41	3.64	2.95	0.14
ΔCGDP	4.08	3.77	3.19	0.00	10.92	3.63	2.95	0.00
ΔEXP	2.22	3.77	3.19	0.00	6.66	3.63	2.95	0.00
ΔEXTD	0.42	3.77	3.19	0.67	4.38	3.66	2.95	0.00
ΔRER	1.40	2.63	1.95	0.16	7.09	3.66	2.95	0.00
ΔFDI	7.60	2.64	1.95	0.00	7.88	3.66	2.96	0.00
Intercept with Time Trend								
CGDP	9.31	2.63	1.95	0.00	4.21	4.24	3.54	0.00
EXP	4.54	2.63	1.95	0.00	1.86	4.24	3.54	0.65
EXTD	4.02	2.63	1.95	0.00	0.29	4.24	3.54	0.99
RER	3.05	3.77	3.19	0.00	4.08	4.24	3.54	0.01
FDI	2.98	3.77	1.95	0.00	2.58	4.61	3.71	0.29
ΔCGDP	10.83	3.77	3.19	0.00	10.81	4.25	3.54	0.00
ΔEXP	6.25	3.77	3.19	0.00	6.91	4.25	3.54	0.00
ΔEXTD	4.74	3.77	3.19	0.00	4.94	4.25	3.54	0.00
ΔRER	4.55	3.77	3.19	0.00	6.86	4.25	3.54	0.00
ΔFDI	8.05	3.77	3.19	0.00	7.98	4.25	3.54	0.00

(Source: Author's Computation, 2025)

Table 2: Lags determination

Lag	LogL	LR	FPE	AIC	SC	HQ
1	−1672.350	NA	4.82e+44*	117.0586*	118.2373*	117.4278*
2	−1653.559	24.62286	8.42e+44	117.4868	119.8442	118.2251
3	−1632.233	20.59048*	1.63e+45*	117.7402*	121.2763*	118.8477*

(Source: Author's Compilation, 2025)

Table 3: Test of unrestricted cointegration, trace

Hypothesized No. of CE (s)	Eigenvalue	Trace Statistic	0.05 Critical value	Probability**
None*	0.998443	260.5258	69.81889	0.0000
At most 1*	0.807676	85.96528	47.85613	0.0000
At most 2*	0.514694	41.45378	29.79707	0.0015
At most 3*	0.368617	21.93343	15.49471	0.0047
At most 4*	0.297076	9.517658	3.841466	0.0020

*Indicates cointegration among the variables. (Source: Author's Compilation, 2025)

Table 4: Unrestricted Cointegration Rank Test

Hypothesized No. of CE (s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Probability**
None*	0.998443	174.5605	33.87687	0.0001
At most 1*	0.807676	44.51150	27.58434	0.0001
At most 2	0.514694	19.52036	21.13162	0.0827
At most 3	0.368617	12.41577	14.26460	0.0960
At most 4*	0.297076	9.517658	3.841466	0.0020

(Source: Author's Compilation, 2025)

between the cointegrated variables, the VECM has been used in the study.

The fact that the ECM is negative and significant indicates that a long-term adjustment will be feasible. The rate of adjustment towards equilibrium is shown by the coefficient of ECM, which is 0.60 (Table 5). This indicates a 60% speed of adjustment. The long-term link between the variables in this study was determined by using the VECM to determine the significance of the error correction term and the coefficients of each independent variable.

The strong and negative ECM suggests that a long-term adjustment will be possible. The coefficient of ECM, which is 0.99, indicates the rate of adjustment towards equilibrium (Table 4). This suggests an adjustment speed of 60%. The relevance of the error correction term and the coefficients of each independent variable were ascertained utilizing the VECM in order to establish the long-term relationship between the variables in this investigation.

4.2. Granger Causality Test

The relationship between the macroeconomic effects of FDI and economic growth in South Africa, as well as the direction of causality, are investigated in this paper using the block exogeneity test. All of the factors used in this investigation are shown in the results in Table 6. Given that the probability is negligible at 11%, the null hypothesis—which holds that there is no causal connection amid exogenous variables and SA economic growth—cannot be rejected at 5%. The hypothesis is directed from the stock of external debt to economic growth. Additionally, it is possible to reject the null hypothesis that there is no causal association between REXR and CGDP at 5%, with a negligible likelihood of 17%. For the time span covered by the analysis, there is essentially a unidirectional causal relationship between EXP and economic growth, going from export to growth. This means that when exports rise, the GDP grows and attracts more foreign direct investment into the country. Given that the likelihood is negligible at 18%, the null hypothesis which states that there is no causal association

Table 5: Vector error correction model

Cointegrating Eq	CointEq1			
CGDP(−1)	1.000000			
EXTD(−1)	3.59E−11			
	(5.8E−11)			
	(0.62271)			
REXR(−1)	0.041524			
	(0.01152)			
	(3.60485)			
FDI(−1)	−6.05E−10			
	(2.3E−10)			
	(−2.62285)			
C	−8.913616			
Error correction:	D (CGDP)	D (EXTD)	D (REXR)	D (FDI)
CointEq1	−0.602793	−7.92E+08	−10.57610	2.23E+08
	(0.03141)	(5.5E+08)	(3.69173)	(9.8E+07)
	(−1.91115)	(−1.42952)	(−2.86481)	(2.27464)
D(CGDP[−1])	−0.100315	6.47E+08	8.968280	−1.64E+08
	(0.33483)	(5.9E+08)	(3.91906)	(1.0E+08)
	(−0.29960)	(1.10043)	(2.28837)	(−1.56943)
D(CGDP[−2])	0.272200	3.71E+08	4.690472	−86044773
	(0.24016)	(4.2E+08)	(2.81092)	(7.5E+07)
	(1.13343)	(0.87981)	(1.66866)	(−1.15062)
D(EXTD[−1])	3.86E−11	0.263311	−1.15E−09	−0.071427
	(1.4E−10)	(0.25047)	(1.7E−09)	(0.04441)
	(0.27097)	(1.05128)	(−0.68979)	(−1.60846)
D(EXTD[−2])	7.66E−11	−0.000999	8.62E−10	0.093652
	(1.6E−10)	(0.28446)	(1.9E−09)	(0.05043)
	(0.47294)	(−0.00351)	(0.45469)	(1.85694)
D(REXR[−1])	0.001914	−17128156	0.223073	−6902039
	(0.01750)	(3.1E+07)	(0.20479)	(5448334)
	(0.10941)	(−0.55738)	(1.08925)	(−1.26682)
D(REXR[−2])	0.014743	9038909	0.200399	−6872310.
	(0.01486)	(2.6E+07)	(0.17392)	(4626903)
	(0.99222)	(0.34636)	(1.15226)	(−1.48529)
D(FDI[−1])	4.30E−10	−1.281826	1.69E−09	−0.367088
	(6.4E−10)	(1.12621)	(7.5E−09)	(0.19967)
	(0.67092)	(−1.13818)	(0.22507)	(−1.83844)
D(FDI[−2])	8.06E−10	−1.280530	5.78E−09	0.151682
	(7.0E−10)	(1.23322)	(8.2E−09)	(0.21865)
	(1.14730)	(−1.03836)	(0.70372)	(0.69373)
C	−0.283698	9.22E+08	3.128181	−1.00E+08
	(0.86990)	(1.5E+09)	(10.1818)	(2.7E+08)
	(−0.32613)	(0.60339)	(0.30723)	(−0.37098)
R-squared	0.722105	0.302529	0.319938	0.533361
Adj. R-squared	0.695733	−0.027852	−0.002197	0.312322
Sum sq. resids	262.6794	8.10E+20	35986.36	2.55E+19
Standard errors equation	3.718230	6.53E+09	43.52033	1.16E+09
F-statistic	2.306406	0.915698	0.993179	2.412968
Log likelihood	−73.10198	−690.4098	−144.4414	−640.2418
Akaike AIC	5.731171	48.30412	10.65113	44.84426
Schwarz SC	6.202652	48.77560	11.12261	45.31575
Mean dependent	−0.194244	1.78E+09	0.796552	60780820
Standard deviation dependent	4.430651	6.44E+09	43.47259	1.40E+09

(Source: Author's Compilation, 2025)

between FDI inflows and economic growth cannot be rejected at 5%. Furthermore, the likelihood of 9%, which is marginally significant, means that the null hypothesis that there is no causal association between CGDP and EXP cannot be rejected at 5%. As a result, the CGDP and EXP have no causal link.

Table 6: Block exogeneity test

Excluded	Chi-square	Difference	Probability
Dependent variable: D(CGDP)			
D(EXTD)	4.302583	2	0.1163
D(REXR)	3.437919	2	0.1793
D(EXP)	9.190351	2	0.0101
D(FDI)	3.389988	2	0.1836
All	11.74064	8	0.1632
Dependent variable: D(EXTD)			
D(CGDP)	0.389808	2	0.8229
D(REXR)	0.803551	2	0.6691
D(EXP)	8.369893	2	0.0152
D(FDI)	0.581303	2	0.7478
All	12.67160	8	0.1237
Dependent variable: D(REXR)			
D(CGDP)	6.491352	2	0.0389
D(EXTD)	0.836315	2	0.6583
D(EXP)	1.218914	2	0.5436
D(FDI)	0.400763	2	0.8184
All	7.688164	8	0.4645
Dependent variable: D(EXP)			
D(CGDP)	0.173710	2	0.9168
D(EXTD)	0.103773	2	0.9494
D(REXR)	0.356826	2	0.8366
D(FDI)	0.310666	2	0.8561
All	1.071975	8	0.9978
Dependent variable: D(FDI)			
D(CGDP)	0.753900	2	0.6860
D(EXTD)	6.515652	2	0.0385
D(REXR)	3.102810	2	0.2120
D(EXP01)	4.020202	2	0.1340
All	12.04833	8	0.1491

(Author's Compilation, 2025)

Given that the likelihood is extremely small at 8%, the null hypothesis that there is no causal association between EXTD and CGDP cannot be rejected at 5%. Furthermore, the probability accounting for 6%, which is marginally significant, means that the null hypothesis that there is no causal association between FDI and CGDP cannot be rejected at 5%. Therefore, there is no causal connection between the CGDP and FDI inflows. On the other hand, based on the relevant levels, which span from REXR to CGDP, it can be concluded that South Africa's growth rate is determined by the real exchange rate. It is considered that there is a unidirectional causal relationship between REXR and CGDP. Essentially, it can be seen that there are unidirectional causalities among the variables.

5. CONCLUSION

Several inferences about the connection among the macroeconomic effects of FDI inflows and the economy of South Africa may be made based on the research findings. First, stationarity is tested using the ADF and DF unit root test before the approaches are selected. It was determined that the variables were integrated of orders I(1) and I(0). The study used the Akaike Information Criterion (AIC) to determine the best lag selection. The Johansen cointegration test was used to examine the long-term connection between the variables, while the VECM helped to determine the short-term association.

To determine whether there is a causal relationship between the variables, the block exogeneity test was employed. It has been demonstrated that there is a unidirectional causal relationship between export and economic growth, i.e., an increase in EXP causes a rise in SA's CGDP. Economic growth and REXR were found to be causally related, indicating that higher REXR values correspond to higher economic growth. Moreover, there is no correlation between FDI inflows and economic expansion. On the other hand, looking at the non-significant levels between EXTD and CGDP indicates that the stock of external debt does not drive growth in SA. The results of this work validate some of the previous research on the macroeconomic effects of foreign direct investment inflows and economic growth (Bhasin and Paul, 2016; Alfaro et al., 2004; Bhasin, 2012). Therefore, it can be concluded that EXTD increase is not the major macroeconomic factors of SA economic growth and development.

Numerous empirical data indicate that there is a noteworthy and causal connection amid EXP and CGDP. Export growth is positively impacted by export promotion, supporting the benefits of an ELG strategy for South Africa. On the other hand, export growth has been sluggish over time. A standardized institution regulating export should be established to oversee the exportable units, the standardization of commodities, necessitating the implementation of an efficient export policy.

The industries that make up a sizable portion of the export basket should have their FDI restrictions raised, according to policymakers. To sum up, in order to reap the intended benefits of FDI inflows, SA must create a framework for FDI policies that is open, permissive, and effective while also bolstering institutional and human resources.

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