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

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Abstract:

This study revisiting macroeconomic impact 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 shown that exports and economic growth have a unidirectional causal relationship; that is, when exports (EXP) increase, SA's economic growth increases. Economic growth and REXR were found to be causally related, meaning that higher REXR values translate into higher economic growth. Furthermore, there is no connection between economic growth and FDI inflows. However, the non-significant levels of external debt (EXTD) compared to CGDP show that SA's growth is not influenced by the amount of foreign debt. The study suggests that in order to monitor the exportable units, their quality, and the standardization of goods and services, a standardized export agency should be set up. This calls for the development of an effective export strategy.

Keywords:

FDI, External Debt, Real Exchange Rate, Export, South Africa

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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 because of this (Ganić, 2025; Maza & 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 et al., 2005; Hansen et al., 2006; Jajri, 2009; Kumar et al., 2002; Makki et al., 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 et al., 2002; De Mello et a., 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 is improving gradually.

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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. The aim of this study is to employ a 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 1986-2022.

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 et al., 2016; Chowdhury et al., 2005; Johansen et al., 2006; Johnson, 2006; Kumar et al., 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 et al. 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 et al., 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 et al., 2006). examined, from 1984 to 2004, the effect of democracy on FDI inflows into a sample of 98 developing nations.

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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 (B´enassy-Qu´er´e et al., 2007). studied the connection among 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 et al., 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. (Assunç˜ao 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.

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$)

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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 (2)

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

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

GDP = $\beta_0 + \beta_1 EXTD + \beta_2 EXP + \beta_3 FDI + \beta_4 EXR + \hat{e}$ (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). β_0 – β_4 are the parameters to be estimated in the model.

Findings and Discussion

Table 1 (see appendix) 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 (see Table 2).

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*

Table 2: Lags Determination (Source: Author's Compilation, 2025)

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 and 4 (see appendix) shows the JCT results.

The short-run relationship that is, to check whether 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

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shows whether or not the model can adapt to a long-run equilibrium following a shock. To find a relationship 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.

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)

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	[-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]

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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
S.E. 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
S.D. dependent	4.430651	6.44E+09	43.47259	1.40E+09

Table 5: Vector Error Correction Model (Source: Author's Compilation, 2025)

Granger Causality Test

The block exogeneity test is used in this paper to examine the relationship between the macroeconomic effects of foreign direct investment (FDI) and economic growth in South Africa, as well as the direction of causality. The results in Table 6 exhibit all the factors used in this investigation. The null hypothesis,

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which maintains that there is no causal connection between exogenous variables and SA economic growth, cannot be rejected at 5% because the probability is negligible at 11%. The idea is focused on economic growth rather than the amount of external debt. Furthermore, at 5%, the null hypothesis—that there is no causal relationship between REXR and CGDP—can be rejected, with an insignificant likelihood of 17%. EXP and economic growth essentially had a unidirectional causal connection for the time period examined in the analysis with export driving growth. This implies that an increase in exports boosts GDP and draws in more foreign direct investment. The null hypothesis, which holds that there is no causal relationship between FDI inflows and economic growth, cannot be rejected at 5% since the likelihood is so small at 18%. Additionally, the null hypothesis that there is no causal association between CGDP and EXP cannot be rejected at 5% due to the likelihood of 9%, which is marginally significant, indicating that there is no causal relationship between CGDP and EXP.

The null hypothesis that there is no causal relationship between EXTD and CGDP cannot be rejected at 5% because the likelihood is so low at 8%. Moreover, the null hypothesis that there is no causal relationship between FDI and CGDP cannot be rejected at 5% due to the probability of accounting for 6%, which is marginally significant. As a result, FDI inflows and the CGDP are not causally related. The real exchange rate, on the other hand, determines South Africa's growth rate, according to the pertinent levels, which range from REXR to CGDP. A unidirectional causal link between REXR and CGDP is thought to exist. In essence, the variables have unidirectional causal relationships with one another.

Dependent variable: D(CGDP)

Excluded	Chi-sq	Df	Prob.
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)

Excluded	Chi-sq	Df	Prob.

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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)

Excluded	Chi-sq	Df	Prob.
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)

Excluded	Chi-sq	Df	Prob.
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)

Excluded	Chi-sq	Df	Prob.

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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

Table 6: Block Exogeneity Test (Source: Author's Compilation, 2025)

Conclusion

Based on the research findings, a number of conclusions on the relationship between the macroeconomic impacts of FDI inflows and the South African economy can be drawn. Prior to choose the methods, stationarity is first examined using the ADF and DF unit root tests. The variables were found to be integrated of orders I(1) and I(0). To choose the optimal lag selection, the study employed the Akaike Information Criterion (AIC). The VECM assisted in identifying the short-term association between the variables, whereas the Johansen cointegration test was utilized to investigate the long-term relationship.

The block exogeneity test was used to ascertain whether the variables were causally related. Export and economic growth have been shown to be causally related in a unidirectional manner, meaning that an increase in EXP raises SA's CGDP. A causal relationship between REXR and economic growth was discovered, suggesting that higher REXR values are associated with faster economic expansion. Furthermore, there is no connection between economic growth and FDI inflows. However, examining the non-significant levels between EXTD and CGDP suggests that SA's growth is not influenced by the amount of external debt. The findings of this study support some of the earlier studies on the macroeconomic impacts of economic growth and foreign direct investment inflows (Bhasin et al. 2017; Alfaro et al. 2004; Bhasin et al. 2012). Thus, it can be said that the main macroeconomic driver of SA's economic growth and development is not the increase in EXTD.

Several empirical findings suggest a significant and causal relationship between EXP and CGDP. Export promotion has a favorable effect on export growth, which bolsters the advantages of an ELG strategy for South Africa. However, export growth has been slow throughout the years. To control the exportable units and the standardization of commodities, a standardized institution regulating exports should be developed. This will require the execution of an effective export policy.

Lawmakers believe that FDI restrictions should be increased for industries that account for a significant share of the export basket. In conclusion, SA must establish an open, liberal, and effective framework for FDI policy while simultaneously strengthening institutional and human resources if it hopes to achieve the desired results of FDI inflows.

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Appendix

		DF Null (H_0): Non-stationary				ADF Null (H_0): Non-stationary			
		ERS_α				DF_α			
$z_{.t}$		$\tau_{.\mu}$	1%	5%	Prob.	τ_τ	1%	5%	Prob.
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
	$\Delta CGDP$	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
	$\Delta EXTD$	0.42	3.77	3.19	0.67	4.38	3.63	2.95	0.00
	ΔRER	1.40	2.63	1.95	0.16	7.09	3.63	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
	$\Delta CGDP$	10.83	3.77	3.19	0.00	10.81	4.25	3.54	0.00

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	ΔEXP	6.25	3.77	3.19	0.00	6.91	4.25	3.54	0.00
	$\Delta EXTD$	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

Table 1 Unit Root Testing, Trace (Source: Author's Compilation,2025)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
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

Table 3: Test of Unrestricted Cointegration, Trace (Source: Author^' s Compilation, 2025)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
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

Table 4: Unrestricted Cointegration Rank Test (Source: Author's Compilation, 2025)