MACROECONOMIC VARIABLES AND FDI INFLOWS: AN EMPIRICAL ANALYSIS FROM SOUTH AFRICA

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Abstract

This study evaluates the macroeconomic variables and foreign direct investment inflows on the rising economy of South Africa. The study employed the Vector Error Correction Model (VECM) and the block exogeneity test to evaluate the variables from 1986 to 2023. Exports and economic growth exhibit a unidirectional causal relationship; specifically, an increase in exports (EXP) correlates with an enhancement in South Africa's economic growth. A causal association was identified between economic growth and REXR, indicating that elevated REXR values correlate with increased economic growth. Moreover, there exists no correlation between economic growth and foreign direct investment inflows. Nonetheless, the negligible levels of external debt (EXTD) in relation to CGDP indicate that South Africa's growth is unaffected by the volume of foreign debt. The report recommends the establishment of a standardised export agency to assess exportable units, their quality, and the standardisation of goods and services. This necessitates the formulation of a robust export strategy.

Introduction

Foreign direct investment (FDI) is very important for every country to help the economy grow in a way that lasts. FDI is certainly the most important thing that is helping the recipient country grow as the world economy becomes more interconnected. This influx of capital not only gives developing countries the money they need, but it also makes it simpler to share management skills and new technologies. Because of this, both affluent and developing countries are competing more for foreign direct investment (FDI), which has led governments to offer investors a variety of incentives. These incentives are usually things like lower tax rates and easier rules for bringing money back to the country for overseas investors. Also, the availability of infrastructure is very important for attracting foreign investors, which makes governments spend a lot of money to help their economies (Pea-Assounga et al., 2025; Gbadebo et al., 2024; Voumik et al., 2023). As rich and poor countries' economies and finances have become more linked, FDI has become a major part of global trade. This, in turn, is the result of other factors, including the rise of institutional investors, the opening up of the economy, and the growth of information technology. Developing countries prefer foreign direct investment (FDI) to flow over foreign portfolio investment since they are regarded to have a positive impact on many macroeconomic indices, such as GDP and exports. But if international investment flows up or down, it can be harder to grasp how to manage the whole economy and the country's

foundations. The host nation may encounter financial and economic risks as a consequence (Ganić, 2025; Maza & Hierro, 2025). A surge could lead to the appreciation or depreciation of the currency rate and/or diminish the competitiveness of the local tradable sector, resulting in long-term detriment (with significant adverse effects in the event of a rapid 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)). It could weaken the host country's abilities, use its resources, or be neutral (Carkovic et al., 2002; De Mello et al., 2000; Johnson, 2006). At this period, the first steps were taken towards economic reform. Over the next few years, the economy slowly opened up to trade and investment from other countries. Recently, the amount of foreign direct investment coming into South Africa has been slowly going up. Since developing countries like India think that foreign direct investment (FDI) inflows are very important, it is even more important to find out if the rising FDI inflows are really having the expected effects on important macroeconomic indicators like CGDP, EXP, and REXR. This research utilised a robust Vector Error Correction Model (VECM) technique to examine the relationship between major macroeconomic variables, such as CGDP, EXP, and REXR, and the inflows of Foreign Direct Investment (FDI) into South Africa from 1986 to 2022.

Literature Review

Theoretical and empirical literature comprehensively examines the macroeconomic impacts of FDI inflows on economic growth. Nonetheless, the findings are predominantly ambiguous. Previous research indicates that FDI inflows exert a heterogeneous influence on economic growth. Many studies have shown that FDI inflows and economic growth are not positively correlated, even though some have found a positive association. Additionally, another study has recorded a weak or insignificant correlation. Numerous studies have examined the relationship between FDI inflows and outflows and various factors such as GDP and exports (Bhasin et al., 2016; Chowdhury et al., 2005; Johansen et al., 2006; Johnson, 2006; Kumar et al., 2002). Most prior study, both theoretical and empirical, concentrated on the potential benefits of FDI inflows for the receiving country's prosperity. The significant impact of FDI on Gross Domestic Product is increasingly recognised as a pertinent reality in global financial literature (Campos et al. 2002). A substantial body of literature employs diverse research methodologies to examine the relationship between FDI inflows and CGDP, as well as the correlations between economic growth and exports. The literature reviews have been divided into different subsections, including studies on developing countries, studies on South Africa, and studies on both developed and developing nations. The study investigates the relationship between FDI inflows and EXR, alongside research analysing the correlation between FDI inflows and CGDP, as well as EXP. The literature review indicates a paucity of study about the dynamics of the relationship between the EXR and other macroeconomic indicators or FDI inflows. Researchers have discovered that countries with more robust legal systems, superior governance infrastructure, and elevated standings in several macroeconomic indicators generally experience a significant

increase in foreign direct investment (FDI) inflows. A thorough analysis is provided for some of these studies. (Globerman et al., 2002). examined the impact of governance on foreign direct investment (FDI) in 144 industrialised and developing countries from 1995 to 1997. They concluded that FDI inflows and outflows are substantially affected by the governance infrastructure, encompassing legal, political, and economic development (Jakobsen et al., 2006). studied how democracy affected FDI inflows into a group of 98 developing countries from 1984 to 2004. Their analysis indicates that FDI inflows were more substantial in democratically emerging nations characterised by robust economic growth. Hyun (2006) identified a long-term, bidirectional cointegrating relationship between FDI and GDP in their analysis of 62 developing economies from 1984 to 2003. (Bénassy-Quéré et al., 2007) examined the relationship between GDP and FDI inflows in a sample of 52 countries from 1985 to 2000, revealing that institutional quality significantly influences FDI inflows. (Busse et al., 2007) examined a sample of 83 countries from 1984 to 2003 and determined that conducive institutional conditions and political stability positively influenced FDI inflows. Assunç˜ao et al. (2011), Jensen et al. (2012), and Saidi et al. (2012) all found comparable results. Mina's 2013 study on Arab economies found that when the government is stable and investment risk is minimal, foreign direct investment (FDI) can increase. In a similar study, Lysandrou et al. (2016) examined 52 countries from 2006 to 2012 and found that favourable public and private governance systems favorably FINinfluence FDI inflows.

Methods

This study encompasses the principal characteristics affected by foreign direct investment inflows and the factors that impact foreign investors' decisions to participate in South African markets. Consequently, the study examines the relationship among FDI inflows, CGDP, EXP, EXTD, and REXR from 1986 to 2021. The variables utilised are from the World Development Indicator Database (WDI, 2021). The Granger Causality Test and the more recent and dependable VECM are utilised in the study to examine the relationship among variables. Johansen and Juselius (1990) employed the classic cointegration method to find long-term relationships between variables in an equation system. The VECM technique employs a singular reduced form of equation. It is also important to find out if the underlying regressors are pure I(0), pure I(1), or a mix of the two because this method requires pre-testing variables. Be careful when using VECM because utilising variables of type I(2) could give you wrong results. The VECM model also does away with the need for a lot of specifications, such as how many exogenous and endogenous variables there are (if any), how deterministic elements are handled, and the best order in which to use lags. The VECM approach is also demonstrated to give more reliable and consistent results when employing sample sizes that are reliable.

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

Where

CGDP = 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:

$$CGDP = \text{EXTD} + EXP + \text{FDI} + EXR \quad (2)$$

$$\text{CGDP} = \beta_0 + \beta_1\text{EXTD} + \beta_2\text{EXP} + \beta_3\text{FDI} + \beta_4\text{EXR} \quad (3)$$

$$\text{CGDP} = \beta_0 + \beta_1\text{EXTD} + \beta_2\text{EXP} + \beta_3\text{FDI} + \beta_4\text{EXR} + \varkappa \quad (4)$$

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

CGDP 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). β0 – β4 are the parameters to be estimated in the model.

Findings and Discussion

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

Table 1: Lags Determination

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-463.2544	NA	631009.4	27.54438	27.76884	27.62093
1	-379.5992	137.7851*	20401.25*	24.09407*	25.44086*	24.55336*
2	-361.2052	24.88599	33316.85	24.48266	26.95177	25.32469
3	-339.5071	22.97439	53630.77	24.67689	28.26833	25.90167

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 2 shows the JCT results.

Table 2: Unrestricted Cointegration Test, Trace

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.486729	64.71883	69.81889	0.0000
At most 1	0.414763	42.04246	47.85613	0.1575
At most 2*	0.366547	23.82736	29.79707	0.2078
At most 3	0.163592	8.304019	15.49471	0.4335
At most 4*	0.063491	2.230284	3.841466	0.0200

* indicates cointegration among the variables

Source: Author's Compilation, 2025

Table 3: Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.486729	22.67637	33.87687	0.5553
At most 1	0.414763	18.21510	27.58434	0.4773
At most 2	0.366547	15.52334	21.13162	0.2539
At most 3	0.163592	6.073735	14.26460	0.6038
At most 4	0.063491	2.230284	3.841466	0.1353

* indicates cointegration among the variables

Source: Author's Compilation, 2025

The Error Correction Model (ECM) can be used to determine the short-term association, or if the variables have a meaningful link in the near term. The model's ability to adjust to a long-term equilibrium after a shock is demonstrated by the long-run adjustment, nevertheless. VECM has been employed in the study to determine a relationship between the cointegrated variables.

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.

Table 4: Vector Error Correction Model

Cointegrating Eq:	CointEq1				
CGDP(-1)	1.000000				
EXTD(-1)	0.020204 (0.24877) [0.08122]				
EXP01(-1)	-1.215194 (0.22594) [-5.37837]				
FDI(-1)	-2.858064 (0.69588) [-4.10709]				
REXR(-1)	0.016540 (0.03840) [0.43071]				
C	4.904450				
Error Correction:	D(CGDP)	D(EXTD)	D(EXP01)	D(FDI)	D(REXR)
CointEq1	-0.159180 (0.27671) [-0.57527]	0.063309 (0.13764) [0.45995]	0.952236 (0.72301) [1.31705]	0.313636 (0.23647) [1.32632]	0.387603 (0.77710) [0.49878]

D(CGDP(-1))	0.059744	-0.343235	0.672551	-0.048983	1.097368
	(0.39050)	(0.19425)	(1.02033)	(0.33371)	(1.09667)
	[0.15300]	[-1.76701]	[0.65915]	[-0.14678]	[1.00064]
D(CGDP(-2))	0.392865	-0.280477	0.388417	0.174864	-1.637500
	(0.40361)	(0.20077)	(1.05460)	(0.34492)	(1.13350)
	[0.97338]	[-1.39701]	[0.36831]	[0.50697]	[-1.44464]
D(EXTD(-1))	1.334892	0.000485	1.860706	0.469420	0.675890
	(0.49016)	(0.24382)	(1.28074)	(0.41888)	(1.37656)
	[2.72339]	[0.00199]	[1.45284]	[1.12064]	[0.49100]
D(EXTD(-2))	0.161136	-0.022993	-0.084868	0.204091	0.063588
	(0.43207)	(0.21492)	(1.12895)	(0.36924)	(1.21341)
	[0.37294]	[-0.10698]	[-0.07517]	[0.55273]	[0.05240]
D(EXP01(-1))	-0.195221	0.068370	-0.068744	0.258265	-0.263787
	(0.27318)	(0.13589)	(0.71379)	(0.23346)	(0.76719)
	[-0.71463]	[0.50314]	[-0.09631]	[1.10627]	[-0.34383]
D(EXP01(-2))	-0.225239	0.015735	-0.205921	0.014436	0.199060
	(0.16785)	(0.08349)	(0.43858)	(0.14344)	(0.47139)
	[-1.34191]	[0.18845]	[-0.46952]	[0.10064]	[0.42229]
D(FDI(-1))	-0.525855	0.395464	1.913933	0.387694	0.242928
	(0.66054)	(0.32858)	(1.72594)	(0.56450)	(1.85507)
	[-0.79609]	[1.20356]	[1.10892]	[0.68680]	[0.13095]
D(FDI(-2))	-0.790183	0.215374	0.352662	-0.080653	2.128860
	(0.49513)	(0.24630)	(1.29374)	(0.42314)	(1.39053)
	[-1.59590]	[0.87445]	[0.27259]	[-0.19061]	[1.53097]
D(REXR(-1))	-0.018166	-0.036484	0.088668	-0.125606	0.285423
	(0.08883)	(0.04419)	(0.23210)	(0.07591)	(0.24946)
	[-0.20451]	[-0.82570]	[0.38203]	[-1.65466]	[1.14416]
D(REXR(-2))	0.132684	-0.013393	0.031387	-0.009944	-0.150082
	(0.09799)	(0.04874)	(0.25604)	(0.08374)	(0.27520)
	[1.35405]	[-0.27476]	[0.12259]	[-0.11875]	[-0.54537]
C	0.491828	-0.125906	-0.361463	0.053373	-1.045524
	(0.55346)	(0.27531)	(1.44615)	(0.47299)	(1.55435)
	[0.88864]	[-0.45732]	[-0.24995]	[0.11284]	[-0.67265]

Source: Author's Compilation, 2025

Granger Causality Test

This study uses the block exogeneity test to examine the direction of causality and the relationship between the macroeconomic effects of foreign direct investment (FDI) and economic growth in South Africa. The findings in Table 6 display every factor that was used in this study. The null hypothesis, which maintains that there is no causal relationship between external variables and SA economic growth, cannot be rejected at 5% because the likelihood is so small 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 a very small chance of 15%. EXP and economic growth essentially had a unidirectional causal connection for the time 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% because the likelihood is insignificant at 12%. Additionally, the null hypothesis that there is no causal relationship between CGDP and EXP cannot be rejected at 5% due to the likelihood of 6%, which is marginally significant. As a result, the CGDP and EXP have no causal connection.

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 7%. Furthermore, the probability accounting for 6%, which is marginally significant, suggests that the null hypothesis that there is no causal link between FDI and CGDP cannot be rejected at 5%. 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.

Table 5: Block Exogeneity Test

Dependent variable: D(CGDP)

Excluded	Chi-sq	Df	Prob.
D(EXTD)	10.61131	2	0.0050
D(EXP01)	2.212083	2	0.3309
D(FDI)	2.650800	2	0.2657
D(REXR)	2.267032	2	0.3219
All	13.44656	8	0.0974

Dependent variable: D(EXTD)

Excluded	Chi-sq	Df	Prob.
D(CGDP)	3.432365	2	0.1798
D(EXP01)	0.394947	2	0.8208
D(FDI)	1.462574	2	0.4813
D(REXR)	0.682128	2	0.7110
All	10.11623	8	0.2570

Dependent variable: D(EXP01)

Excluded	Chi-sq	Df	Prob.
D(CGDP)	0.435294	2	0.8044
D(EXTD)	2.528844	2	0.2824
D(FDI)	1.582540	2	0.4533
D(REXR)	0.145962	2	0.9296
All	11.04477	8	0.1992

Dependent variable: D(FDI)

Excluded	Chi-sq	Df	Prob.
D(CGDP)	0.489482	2	0.7829
D(EXTD)	2.653877	2	0.2653
D(EXP01)	3.087343	2	0.2136
D(REXR)	2.911563	2	0.2332
All	9.015991	8	0.3409

Dependent variable: D(REXR)

Excluded	Chi-sq	Df	Prob.
D(CGDP)	6.316565	2	0.0425
D(EXTD)	0.334489	2	0.8460
D(EXP01)	1.560229	2	0.4584
D(FDI)	3.651931	2	0.1611
All	17.52110	8	0.0251

Source: Author's Compilation, 2025

Conclusion

Based on the research findings, several conclusions on the relationship between the macroeconomic impacts of FDI inflows and the South African economy can be drawn. Prior to choosing 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 policies while simultaneously strengthening institutional and human resources if it hopes to gain from FDI inflows as intended.

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