

# DOES FOREIGN DIRECT INVESTMENT COMPLEMENT OR SUBSTITUTE DOMESTIC INVESTMENT IN BOTSWANA?<sup>1</sup>

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## ABSTRACT

The impact of foreign direct investment (FDI) inflows and outflows on domestic investment in Botswana was examined using data for the period from 1990 to 2022. The study was motivated by Botswana's efforts to attract FDI in support of economic diversification. The question this study sought to answer was: "Does the liberalisation of foreign investment outflows and inflows in Botswana support domestic investment?" The study employed the non-linear autoregressive distributed lag (NARDL) approach to assess whether foreign direct investment complements or the substitutes domestic investment in Botswana. The study found that positive shocks to foreign direct investment inflows complement domestic investment in the short run but substitute it in the long run, while negative shocks to foreign direct investment inflows are insignificant across both time horizons. Positive shocks to foreign direct investment outflows were found to complement domestic investment in the short run but substitute it in the long run. Conversely, negative shocks to foreign direct investment outflows lead to an increase in domestic investment in the long run, although they are insignificant in the short run. Policy implications are also discussed.

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## 1. INTRODUCTION

The neo-classical growth models advocated for capital accumulation, labour force growth, and exogenous technology growth as sources of long-term growth. Various studies have been done expanding on the simple production function where capital has been extended to foreign capital in the form of foreign direct investment or foreign aid ([Madondo et al. 2025](#); [Ayenew, 2022](#); [Adusei, E, 2020](#); [Falki, 2009](#); [Durbarray, Gemmell & Greenaway, 1998](#)). Foreign direct investment

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has been associated with several advantages, apart from expanding the capital base for a country, ranging from technology enhancement and spillover effects to the promotion of good management in the receiving economy. Studies have also pointed to the positive impact of FDI on economic growth (see: [Chidoko & Sachirarwe, 2015](#); [Tang & Tan, 2018](#)). Based on these benefits, most African countries have put in place policies that promote foreign direct investment inflows to argument domestic investment. Savings that are insufficient to support domestic investment demand in most African countries have made efforts to attract FDI plausible. To create an enabling environment that can attract FDI, most African countries have formulated investment policies and programmes that support foreign direct investment inflows. Botswana is not an exception on this strategy, aimed at augmenting domestic investment. The investment policies have been revised to make it easy for foreign investors to do business in Botswana. Despite the positive contribution of FDI to domestic investment widely held by African government and vast empirical literature, there is a strand of literature that found FDI inflows and outflows to have negative effects on domestic investment. The overall sentiment is a substitution effect of foreign direct investment on domestic investment. This has long term negative effects on the domestic economy and tends to create dependence on foreign investment to boost domestic investment. This study, therefore, investigates if foreign direct investment has a complementary or substitution effect on domestic investment in Botswana.

Several studies have examined the impact of foreign direct investment inflows on domestic investment. The findings from these studies are mixed, with some studies finding a complementary effect (see [Djokoto, 2021](#); [Budang & Hakim, 2020](#); [Oualy, 2019](#); [Ibhagui & Olawole, 2019](#); [Selmi, 2016](#)), while others found a substitution effect (for example, [Setiyanto, 2022](#); [Ngeendepl & Phiri, 2021](#); [Gizaw, Dedeho & Lodamo, 2021](#)). There are some studies that found FDI neutrality (see, [Polat, 2017](#)). Some studies found both complementarity and substitution effect in the same study depending on regions or time frames considered (see, [Jude, 2019](#); [Xu and Yuan, 2012](#); [Adams, 2009](#)). A few studies have investigated the impact of foreign direct investment outflows on domestic investment using non-linear autoregressive distributed lag (NARDL), despite the importance of understanding the link between the two. An examination of the complementarity and substitution effect of FDI on domestic investment provides valuable information in enhancing investment policies currently used in Botswana to advance domestic investment.

The study employs the non-linear autoregressive distributed lag approach (NARDL) to investigate the nature of the impact of FDI inflows and outflows on

domestic investment in Botswana. Most studies examining the impact of foreign direct investment inflows and outflows on domestic investment have assumed that positive and negative shocks in FDI exert the same effect on domestic investment, which is not always valid. The NARDL allows an analysis of the impact of FDI on domestic investment taking into account the impact of negative and positive shocks on FDI. This departs from the current body of knowledge and provides more insight to policy makers in Botswana on how to boost domestic investment. The key variables in this study are FDI inflows, FDI outflows and domestic investment.

Botswana is a good case study for this research given that it has managed to grow its economy from a poor country to an upper-middle income country. Botswana has grown its economy in the past based on strategic use of diamond resources. The current investment thrust of the country is to attract investment in other sectors of the economy, apart from diamond. The outcome of this study will contribute to informed policy formulation in attracting foreign investment. To the best knowledge of the researcher, this is the first study that investigated the impact of foreign direct investment inflows and outflows on domestic investment for Botswana using NARDL. This is an area that has not been fully explored to establish if foreign direct investment complement or substitute domestic investment for Botswana.

The rest of the study is structured as follows: Section 2 outlines the literature – country-based and empirical literature, Section 3 dwells on estimation techniques, and Section 4 presents and discusses the empirical results. Section 5 concludes the study.

## 2. LITERATURE

### 2.1 FDI and domestic investment dynamics in Botswana

Botswana's investment climate has been strengthened and made competitive through several regulatory reforms. Among the reforms were the Companies Act, investor protection through the Industrial Property Act, Acquisition of Property Act and investment in different economic sectors ([Organisation of Economic Cooperation and Development 'OECD', 2014](#)). In 2010, the government launched the Economic Diversification Drive – a guide to economic policy planning anchored on creation of a vibrant private sector ([OECD, 2014](#)). In 2011, the merger of the Botswana Export Development and Investment Authority (BEDIA) and Botswana International Financial Services Centre (IFSC) was done to streamline investment in Botswana ([OECD, 2014](#)). The successor organisation,

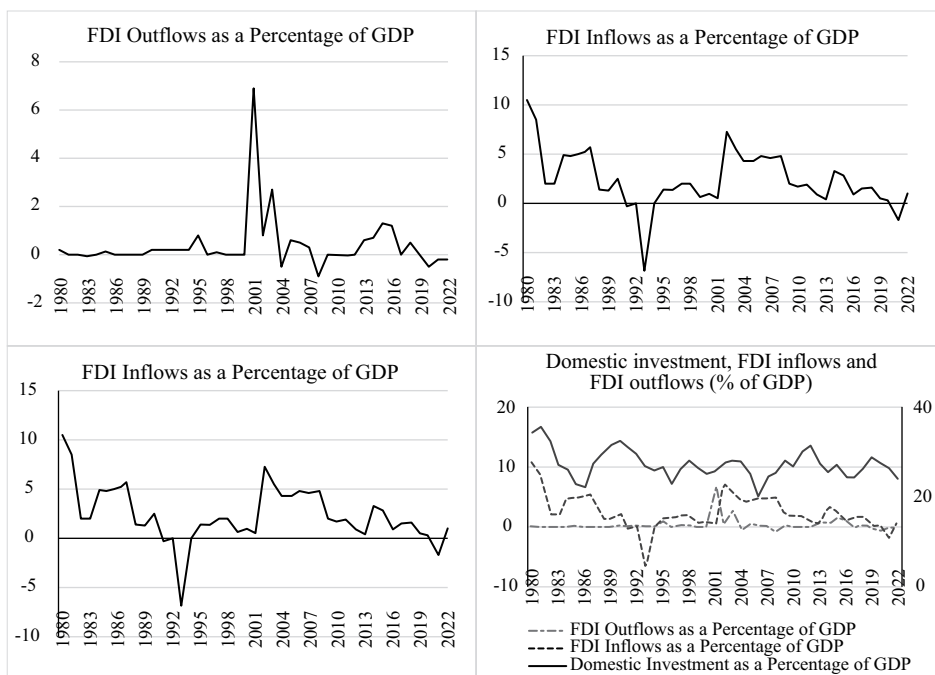
Botswana Investment and Trade Centre (BITC) established a facilitation centre to support qualifying investors willing to do business in Botswana (OECD, 2014). The BITC promotes both domestic and foreign investment. To leverage investment promotion, the BITC identifies and promotes growth sectors, offers financial and non-financial incentives to investors (BITC, 2024).

The investment drive in Botswana is guided by the need to diversify from diamonds to other sectors of the economy. The Economic Diversification Drive (EDD) short- and medium- to long-term strategies are designed to create growth and income sources for Botswana to be tied to all sectors of the economy – a move from diamond as a source of income and growth (Republic of Botswana, 2024). The EDD also aims to wean the private sector from government support, aligned with a reduction in government expenditure (Republic of Botswana, 2024).

The government has made concerted effort to attract FDI in export-oriented manufacturing since the late 1990s, to diversify the economy from being solely diamond-dependent (OECD, 2014). To simplify doing business in Botswana, the Botswana One Stop Service Centre (BOSSC) was established in 2017 (United Nations Trade and Development, 2017). The BOSSC is a facilitation centre within the BITC that focuses on simplifying administrative procedures for investors. In the BOSSC, relevant government agencies are housed to provide prompt, efficient and transparent services to investors such as permitting, visa application, business registration, connection to utilities, income and VAT registration, access to industrial and commercial land, and industrial licensing (United Nations Trade and Development, 2017). Business eligible to the BOSSC service should demonstrate several qualities, for example, potential for export, potential for skills and technology transfer, innovation and creativity, investment in agriculture, mining, agro- processing, information and technology, and transport and hospitality, among other important sectors (United Nations Trade and Development, 2017).

Botswana places priority on private sector participation in advancing economic growth, where the government provides equal playing fields between the public and the private sectors in the infrastructure development, which the country highlights as a cornerstone of economic growth. Aligned to minimise government interference and increase efficiency, the government established the Public Enterprise Evaluation and Privatisation Agency, and the Privatisation Masterplan in 2000 and 2005, respectively. Under the Privatisation Masterplan, services and enterprises suitable for divestiture and outsourcing were identified, thereby creating scope for the private sector to provide such services or undertake outsourced activities where efficiency is enhanced.

Botswana has made progress in creating a regulatory environment that supports investment from both foreign and domestic investors. However, further efforts are required to consolidate fragmented laws in order to facilitate easier access for investors (OECD, 2014). Access to land remains a cumbersome process for investors, especially the change of land use for businesses purposes, which hampers entrepreneurial activities. Skills mismatch remains a challenge in Botswana that humpers investment attraction and competitiveness. Another challenge that has negatively affected investment attraction in Botswana is infrastructure limitation, especially electricity generation. The trends in foreign direct investment and domestic investment in Botswana from 1980 to 2022 are depicted in Figure 1.



**Figure 1:** Trends in Foreign Direct Investment and Domestic Investment 1980 -2022  
Source: World Bank (2024)

Foreign direct investment outflows have remained depressed over the study period with exceptional years like 2001, 2003, 2015 and 2016 where surges were recorded (World Bank, 2024). Botswana has not received FDI inflows that matched the inflows of 10.5% received in 1980 (World Bank, 2024). FDI inflows declined from 1980 reaching a low of of -6.9% in 1993 (World Bank, 2024). The average annual FDI inflow over the study period registered was 2.4% (World

[Bank, 2024](#)). The trend suggests that Botswana has struggled to attract the level of FDI inflows required to accelerate its diversification efforts. This has been worsened by domestic investment that has remained subdued over the study period, with an average of 27.3% between 1980 and 2024 ([World Bank, 2024](#)).

## 2.2 Empirical literature

The link between foreign direct investment and domestic investment can be traced to the economic growth models that proposed capital and labour as the main source of economic growth. Economic growth is buttressed by domestic investment captured by gross capital formation in this study. Solow-Swan model tried to explain the sources of economic growth in the long run where capital accumulation, labour and increase in productivity, largely attributed to technological advancement were proposed. In this study, foreign direct investment is external investment source that complements domestic investment. In addition, foreign direct investment inflows bring other advantages like technology diffusion. Theoretically, positive shocks in FDI inflows are expected to positively contribute to domestic investment, whereas negative shocks in FDI inflows are expected to negatively impact domestic investment. Positive shocks in FDI outflows are expected to negatively impact domestic investment, while negative shocks in FDI inflows are expected to positively impact domestic investment.

Among studies that found foreign investment to positively impact domestic investment is [Setiyanto \(2022\)](#), in a study on Indonesia, using quarterly data from 1990 Q2 to 2020 Q2, the study found a complementary effect of FDI in the primary and secondary sectors and a neutral effect in the tertiary sector. [Ngeendepi and Phiri \(2021\)](#) investigated the complementarity or substitution effect of FDI for 15-countries in the Southern African Development Community (SADC) region using data from 1991 to 2019. Employing panel pool mean group ARDL, the study found that FDI complements domestic investment both in the short and in the long run. [Gizaw, Dedeho and Lodamo \(2021\)](#) analysed the impact of FDI on domestic investment for Ethiopia from 1981 to 2019 using an ARDL approach, and the study found that FDI positively impacts domestic investment. [Mushtaq, Shaheen and Khan \(2020\)](#) studied the impact of FDI and foreign remittances on domestic investment on a sample of five South Asian economies using data from 1976 to 2017. The study found that two capital inflows to increase domestic investment.

Among the studies that found foreign direct investment to negatively impact domestic investment, [Djokoto \(2021\)](#) examined the impact of FDI on domestic

investment in the food manufacturing sector using an unbalanced panel dataset of 49 developing, transition and developed countries between 1993 and 2016. Using Generalised Method of Moments (GMM), the study found FDI to negatively impact domestic investment in developed countries in the short run. In the long run, the study found FDI to substitute domestic investment across all the countries. In the same vein, [Budang and Hakim \(2020\)](#) investigated the complementarity or substitution effect of FDI on domestic investment in 38 Asian countries using data for the period 1993-2016. The study found FDI to substitute domestic investment.

In the same spirit, in a study on the impact of FDI on domestic investment for Cote d'Ivoire, [Oualy \(2019\)](#) also found FDI to negatively impact domestic investment, but only in the long run, using time series data from 1975 to 2018. Similarly, [Ibhagui and Olawole \(2019\)](#) found FDI to substitute domestic investment in the Organization of the Petroleum Exporting Countries (OPEC) countries, except Angola and Kuwait. [Ahmad et al \(2018\)](#), employing panel data analysis and data for 30 Chinese provinces, found that FDI substituted for domestic investment when DOLS and GMM approaches were applied. [Selmi \(2016\)](#) also studied the impact of FDI on local investment in the MENA region, using a sample of 7 countries - Algeria, Morocco, Jordan, Syria, Tunisia, Lebanon and Egypt. The study found FDI to negatively impact local investment.

[Liu et al. \(2015\)](#), employing data from 1978 to 2011 for China, examined the impact of FDI on regional growth and inequality. The study found FDI to positively impact growth through enhancement of physical and human capital. However, the study also pointed out the negative impact of FDI through substitution effect on domestic investment and increasing the opportunity cost of technology innovations. [Mutenyo, Asmah and Kalio \(2010\)](#), in a study on 34 Sub-Saharan countries on the crowd-in or crowd-out effect of foreign direct investment on private investment, found a crowd-out effects to prevail for the sample countries.

Some studies found mixed results. [Jude \(2019\)](#) examined the impact of foreign investment on domestic investment for 10 Central and Eastern European countries using data from the period 1995-2015. The study found foreign investment to negatively impact domestic investment in the short run and positively in the long run. [Xu and Yuan \(2012\)](#), in a study examining the impact of foreign investment on domestic investment with particular emphasis on regional differences, found that FDI had a negative effect on domestic investment in the eastern and central regions, while promoting domestic investment in the western region. [Adams \(2009\)](#), in a study on sub-Saharan African countries, using data from 1990 to

2003, found that domestic investment had a positive effect on economic growth. The study also found that FDI had a negative effect on growth in the short run and a positive impact in the long run.

[Polat \(2017\)](#) assessed the impact of FDI on domestic investment for 30 countries within the Organisation for Economic Co-operation and Development (OECD) for the period from 2006 to 2013. By employing the one-step Generalised Method of Moments system, the study found that overall FDI did not have any effect on domestic investment. However, inter-company loans were found to have a positive effect on domestic capital formation.

The literature reviewed points to the mixed results on the impact of FDI on domestic investment. Thus, a country -by -country analysis of the relationship between the two should be done to allow policy makers to come up with relevant FDI-domestic investment policies. The literature indicates a departure from the widely held notion that FDI is invariably beneficial for domestic investment, underscoring the importance of conducting rigorous country-specific analysis prior to formulating FDI policies.

### **3. ESTIMATION TECHNIQUES**

The study employs the non-linear autoregressive distributed lag (NARDL) developed by [Shin et al. \(2014\)](#) to investigate the impact of foreign direct investment on domestic investment. The approach was selected due to numerous advantages it provides over other methods. For example, the approach departs from the traditional ARDL by decomposing the independent variable, in this case, FDI into positive and negative shocks on domestic investment. The results of the study based on the NARDL are more informative on the fluctuations in FDI and the subsequent impact on domestic investment.

#### **Variables**

Variables of interest in this study are domestic investment (DI), foreign direct investment inflows (FDII) and outflows (FDIO) captured as a percentage of GDP. Domestic investment is measured by gross fixed capital formation as a percentage of GDP, while FDI inflows and outflows are captured as a percentage of GDP. Other control variables included in the model are inflation (INF) measured by the change in Consumer Price Index, domestic saving as a percentage of GDP (DS) and Gross Domestic Product per Product (GDPPC). All the variables used in this study are in levels.

**Table 1:** Variable description and data source

Variable	Description	Data Source
DI	Gross fixed capital formation as a percentage of GDP	WDI
FDII	Foreign direct inflows investment as a percentage of GDP	WDI
FDIO	Foreign direct outflows investment as a percentage of GDP	WDI
INF	Change in CPI	WDI
GDPPC	Gross Domestic Product per Product	WDI
DS	Domestic saving as a percentage of GDP	WDI

Note: WDI = World Development Indicators

Source: Author’s calculation

### General model specification

$$DI = f(FDII, FDIO, INF, GDPPC, DS) \dots\dots\dots (1)$$

Where:

- DI* = domestic investment
- FDII* = foreign direct investment inflows
- FDIO* = foreign direct investment outflows
- INF* = inflation
- GDPPC* = Gross Domestic Product Per Capita
- DS* = domestic savings

The model accounts for positive and negative shocks in FDII and FDIO on domestic investment. Foreign direct investment inflows (FDII) and outflows (FDIO) are decomposed into positive and negative partial sum.

$$FDII_t = \rho_0 + FDII_t^+ + FDII_t^- \dots\dots\dots (2)$$

Where:

$$FDII_t^+ = \sum_{j=1}^t \Delta FDII_t^+ = \sum_{j=1}^t \max(\Delta FDII_j; 0) \dots\dots\dots (3)$$

$$FDII_t^- = \sum_{j=1}^t \Delta FDII_t^- = \sum_{j=1}^t \min(\Delta FDII_j; 0) \dots\dots\dots (4)$$

The positive and negative partial sums for foreign direct investment outflows are given in equation (5) and (6).

$$FDIO_t = \rho_0 + FDIO_t^+ + FDIO_t^- \dots\dots\dots(5)$$

Where:

$$FDIO_t^+ = \sum_{j=1}^t \Delta FDIO_t^+ = \sum_{j=1}^t \max(\Delta FDIO_j; 0) \dots\dots\dots(6)$$

$$FDIO_t^- = \sum_{j=1}^t \Delta FDIO_t^- = \sum_{j=1}^t \min(\Delta FDIO_j; 0) \dots\dots\dots(7)$$

Based on Equation (2) to (7) the NARDL model is given in Equation (8) as:

$$\begin{aligned} \Delta DI_t = & \delta_0 + \sum_{i=1}^p \delta_{1i} \Delta DI_{t-i} + \sum_{i=0}^{q1} \delta_{2i}^+ \Delta FDII_{t-i}^+ + \sum_{i=0}^{q2} \delta_{3i}^- \Delta FDII_{t-i}^- + \sum_{i=0}^{q3} \delta_{4i}^+ \Delta FDIO_{t-i}^+ \\ & + \sum_{i=0}^{q4} \delta_{5i}^- \Delta FDIO_{t-i}^- + \sum_{i=0}^{q5} \delta_{6i} \Delta INF_{t-i} + \sum_{i=0}^{q6} \delta_{7i} \Delta GDPPC_{t-i} + \sum_{i=0}^{q7} \delta_{8i} \Delta DS_{t-i} + \alpha_1 DI_{t-1} \\ & + \alpha_2^+ FDII_{t-1}^+ + \alpha_3^- FDII_{t-1}^- + \alpha_4^+ FDIO_{t-1}^+ + \alpha_5^- FDIO_{t-1}^- + \alpha_6 INF_{t-1} + \alpha_7 GDPPC_{t-1} \\ & + \alpha_8 DS_{t-1} + \mu_{1t} \end{aligned} \dots\dots\dots(8)$$

Where:  $\delta_0$  = constant;  $\delta_1$ - $\delta_8$ = short-run coefficients;  $\alpha_1$ - $\alpha_8$  = long-run coefficients; and  $\mu_{1t}$  = error term.

A test for a long-run relation is based on the hypothesis:

H0:  $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = \alpha_6 = \alpha_7 = \alpha_8 = 0$ , against the hypothesis of a long run relationship among the variables in the model.

H1:  $\alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq \alpha_5 \neq \alpha_6 \neq \alpha_7 \neq \alpha_8 \neq 0$ .

The NARDL error correction model of Equation 8 is specified in Equation (9) as:

$$\begin{aligned} \Delta DI_t = & \delta_0 + \Delta DI_t = \delta_0 + \sum_{i=1}^p \delta_{1i} \Delta DI_{t-i} + \sum_{i=0}^{q1} \delta_{2i}^+ \Delta FDII_{t-i}^+ + \sum_{i=0}^{q2} \delta_{3i}^- \Delta FDII_{t-i}^- \\ & + \sum_{i=0}^{q3} \delta_{4i}^+ \Delta FDIO_{t-i}^+ + \sum_{i=0}^{q4} \delta_{5i}^- \Delta FDIO_{t-i}^- + \sum_{i=0}^{q5} \delta_{6i} \Delta INF_{t-i} + \sum_{i=0}^{q6} \delta_{7i} \Delta GDPPC_{t-i} \\ & + \sum_{i=0}^{q7} \delta_{8i} \Delta DS_{t-i} + \lambda ECM_{t-1} + \mu_{2t} \end{aligned} \dots\dots\dots(9)$$

Where: ECM = Error correction term.

$\lambda$  is the coefficient on the error term and is expected to have a negative sign confirming that the model converges to the equilibrium after a disequilibrium in the model.

#### 4. EMPIRICAL RESULTS

A test on the stationarity of variables included in the model was done by using the Dickey-Fuller Generalised Least Square (DF-GLS) and the Phillip-Perron (PP) tests. This was done to ensure that the model does not have variables stationary with a higher order than one, which is not acceptable with the approach, and to avoid spurious regression. The results of the unit root test are reported in Table 2.

**Table 2:** Unit Root Results

Dickey-Fuller Generalised Least Squares (DF-GLS) and Phillip-Perron Tests				
Variable	Dickey-Fuller Generalised Least Square (DF-GLS)		Phillips-Perron (PP)	
	Level	$\Delta$	Level	$\Delta$
DI	0.083	-5.453***	-3.766	-5.673***
FDII	-2.041	-6.687***	-4.028	-8.329***
FDIO	-2.090	-5.762***	-2.830***	-7.548***
INF	-2.100*	-	-2.598	-7.646***
GDPPC	-2.087	-6.301***	-2.497	-9.661***
DS	-1.417	-4.880***	-2.838	-6.355***

Note: \*, \*\* and \*\*\* denote stationarity at 10%, 5% and 1% significance levels respectively.

Source: Author’s calculation

Results reported in Table 2 confirm that all the variables included in the model are stationary in either level of first difference. Table 3 reports cointegration results based on the ARDL approach developed by [Pesaran and Shin \(1999\)](#) and expanded by [Pesaran et al. \(2001\)](#).

**Table 3:** Cointegration Results

F-Statistic	Cointegration Status					
5.226**	Cointegrated					
Asymptotic critical values						
10%		5%		1%		
I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	
2.254	3.388	2.685	3.960	3.713	5.326	

Note: \*, \*\* and \*\*\* denote stationarity at 10%, 5% and 1% significance levels respectively.

Source: Author’s calculation

The calculated F-statistics reported in Table 3 is compared to the upper and lower critical values also reported in the table. If the F-statistic is greater than any upper bound at 1%, 5% or 10%, cointegration is confirmed. However, if the F-statistic is below the lower bound, no long run relationship is confirmed. Results reported in Table 4 confirm long run relationship among the variables in the model given that the F-statistic of 5.226 is greater than the upper bound critical value at 5% level of significance. The next step is a test of long run and short run asymmetry on FDII and FDIO to check the suitability of an NARDL approach. The results are presented in Table 4.

**Table 4:** Long run and Short Run Asymmetric Test Results

Test	F-statistic	P-value	Decision
$W_{LR} - FDI$	3.127	0.018*	Asymmetric
$W_{SR} - FDI$	10.867	0.001***	Asymmetric
$W_{LR} - FDIO$	8.982	0.002**	Asymmetric
$W_{SR} - FDIO$	8.105	0.003**	Asymmetric

Source: Author’s calculation

$W_{LR}$  = long-run asymmetric test

$W_{SR}$  = short-run asymmetric test

+ and - denotes positive and negative shocks.

\*, \*\* and \*\*\* denote statistical significance at 10%, 5% and 1% levels, respectively

The results presented in Table 4 confirmed asymmetry on positive and negative values on FDI inflows and outflows. This confirms that the study can proceed with the NARDL approach.

To proceed with the analysis, a parsimonious model is selected based on the Schwarz Bayesian Criteria (SBC) with optimal lags (2, 3, 1, 2, 1, 0, 3, 3) for domestic investment (DI), FDI and partial sums, FDIO and partial sums, inflation (INF), Gross Domestic Product per capita (GDPPC) and domestic savings (DS). The long run and short run results are reported in Table 5.

**Table 5.** Long-run and short-run Results

Dependent Variable is DI		
Panel A: Long-Run Results		
Regressor	Coefficient	T-ratio [p-value]
<i>FDIF</i> <sup>+</sup>	-2.699***	-5.482[0.000]
<i>FDIF</i> <sup>-</sup>	1.180	-1.679 [0.103]
<i>FDIO</i> <sup>+</sup>	-5.173*	-1.815[0.080]
<i>FDIO</i> <sup>-</sup>	-6.807**	-2.390[0.023]
<i>INF</i>	-1.040***	-3.522[0.001]
<i>GDPPC</i>	28.983***	4.525[0.000]
<i>DS</i>	-0.617***	-4.023[0.000]
Panel B: Short-Run Results		
Regressor	Coefficient	T-ratio [p-value]
$\Delta DI(-1)$	0.561*	2.052 [0.059]
$\Delta FDIF$ <sup>+</sup>	11.885	0.522 [0.609]
$\Delta FDIF$ <sup>+</sup> (-1)	1.173**	2.716 [0.017]
$\Delta FDIF$ <sup>+</sup> (-2)	1.118**	2.803 [0.014]
$\Delta FDIF$ <sup>-</sup>	0.1652	0.626 [0.541]
$\Delta FDIO$ <sup>+</sup>	-0.073	-0.233 [0.819]
$\Delta FDIO$ <sup>+</sup> (-1)	3.040**	2.384 [0.032]
$\Delta FDIO$ <sup>-</sup>	-0.598	-0.488 [0.633]
$\Delta GDPPC$	10.196***	3.706 [0.002]
$\Delta GDPPC(-1)$	7.741**	2.364 [0.033]
$\Delta GDPPC(-2)$	8.782***	-3.70 [0.005]
$\Delta DS$	-0.109	-0.7214[0.483]
$\Delta DS(-1)$	0.486***	3.285[0.005]
$\Delta DS(-2)$	0.392*	3.060 [0.054]
<i>ECM</i> (-1)	-0.654***	-5.427 [0.000]
Panel C: Test statistics		
R- Squared	0.718	
R-Bar-Squared	0.517	
F-statistic [Prob]	3.568 [0.004]	
DW Stat	1.826	
Serial correlation	2.598[0.116]	
Heteroscedasticity	0.775[0.711]	

Note: \*, \*\* and \*\*\* denote stationarity at 10%, 5% and 1% significance levels respectively.

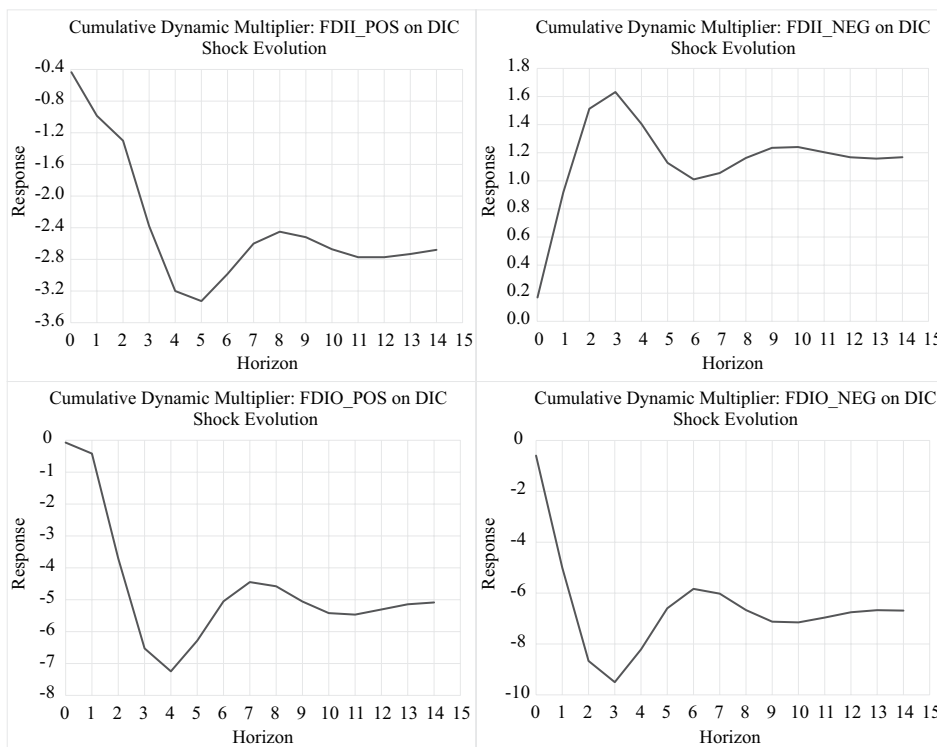
Source: Author's calculation

The results reported in Table 5, Panel A and Panel B confirmed that positive shocks in foreign direct investment inflows have a substitution effect on domestic investment. This was confirmed by the coefficient of  $FDII^+$  which was negative and statistically significant at 1%. In the short run, positive shocks in FDI were found to have positive impact on domestic investment in Botswana. This was confirmed by  $\Delta FDII^+(-1)$  and  $\Delta FDII^+(-2)$  coefficients that are positive and statistically significant at 5% level. Thus, FDI inflows complement domestic investment in the short run. However, the study found that negative shocks in FDI had no significant impact on domestic investment, irrespective of the time considered. Positive shocks in  $FDII$  were found to have greater and lasting influence on domestic investment as reported by the dynamic multiplier graphs in Figure 3.

Results on foreign direct investment outflows confirmed that positive shocks have a substitution effect on domestic investment in the long run and a complementary impact in the short run. However, negative shocks on foreign direct investment outflows have a substitution effect on domestic investment in the long run and insignificant in the short run. Overall, negative shocks in foreign direct investment outflows have a deep effect on domestic investment in Botswana according to the dynamic multiplier graph in Figure 3.

Other results reported in Table 4 revealed that inflation has a negative effect on domestic investment in the long run, while Gross Domestic Product per capita has a positive effect on domestic investment regardless of the time considered. Domestic savings were found to negatively effect domestic investment in the long run, and a positive effect was confirmed on domestic investment in the short run. The negative effect could be attributed to a decrease in expenditure as households save more, which negatively affects demand for goods and services. This results in a decrease in aggregate demand, causing a decline in reinvestment or new investment. However, in the short run savings tend to boost resources available for investment through bank intermediation.

The variables included in the model explain 72% of the variability in domestic investment and an error term (ECM) of -0.65 with the expected negative sign. It takes about one year and less than six months to reach convergence back to the equilibrium whenever a disequilibrium is experienced in the system. The model passed heteroscedasticity, serial correlation as reported in Table 5.



**Figure 2:** Cumulative Dynamic Multiplier Graphs  
 Source: Author’s calculation

## CONCLUSIONS

The impact of FDI inflows and outflows on domestic investment was investigated for Botswana using data from 1990 to 2022. The study was motivated by the drive that Botswana has taken to attract FDI to support the diversification of the economy. The question this study sought to answer was whether foreign investment inflows and outflows in Botswana complement or substitute domestic investment in Botswana. Using the non-linear ARDL, the study found that positive shocks in foreign direct investment complemented domestic investment in the short run, but substituted domestic investment in the long run. The study also found that positive shocks on foreign direct investment outflows substituted domestic investment in the long run, while complemented domestic investment in the short run. On the other hand, negative shocks in FDIO are associated with a negative change in domestic investment in the long run, and insignificant in the short run. Overall, positive shocks in FDII have greater weight on domestic

investment than negative shocks, while negative shocks on FDIO have greater effect on domestic investment in Botswana than positive shocks, as indicated by the dynamic multiplier graphs of the two key variables.

It can be concluded that foreign direct investment plays an important role in Botswana in supporting domestic investment in the short run, but not in the long run. The results support the the Government of Botswana's decision to open the economy to foreign investors as part of its efforts to diversify the economy. Botswana is therefore encouraged to continue strengthening policies that attract foreign direct investment, such as the use of one-stop shop to simplify administration processes for investors and the provision of a conducive business environment. However, this move needs to be undertaken with caution, as excessive reliance on foreign investment may lead to substitution effect on domestic investment in the long run. These findings further indicate that foreign direct investment outflows tend to compete with domestic investment in the long run when there is a positive shock in FDIO, whereas negative shocks in FDIO are associated with an increase in domestic investment over the same period. Based on these results, it is recommended that policymakers in Botswana encourage domestic investors to prioritise opportunities within the domestic economy, before investing abroad. The Government of Botswana may also introduce targeted incentives to stimulate domestic investment in industries with strong growth potential. In doing so, Botswana can position itself as a preferred destination for domestic investors prior to the consideration of outward investment.

Although efforts were made to ensure the scientific rigour of the study, several limitations should be acknowledged. The study period spans from 1990 to 2022, reflecting constraints related to data availability. The use of alternative datasets may yield different results. Furthermore, domestic investment was proxied by gross fixed capital formation; future research could benefit from the use of disaggregated sectoral data in order to capture the sectore-specific effects of foreign direct investment inflows and outflows.

### **Conflict of interests**

The author declares there is no conflict of interest.

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## ДА ЛИ СТРАНЕ ДИРЕКТНЕ ИНВЕСТИЦИЈЕ ДОПУЊУЈУ ИЛИ ЗАМЈЕЊУЈУ ДОМАЋЕ ИНВЕСТИЦИЈЕ У ПОДСТИЦАЊУ ДОМАЋИХ ИНВЕСТИЦИЈА У БОЦВАНИ?

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### САЖЕТАК

Утицај прилива и одлива страних директних инвестиција на домаће инвестиције анализиран је за Боцвану коришћењем података за период од 1990. до 2022. године. Студија је мотивисана настојањем Боцване да привуче стране директне инвестиције како би подржала диверсификацију своје економије. Питање на које је ово истраживање настојало да одговори било је: „Да ли либерализација прилива и одлива страних инвестиција у Боцвани подржава домаће инвестиције?” У студији је примијењен нелинеарни ауторегресивни модел расподијељених кашњења како би се испитало да ли постоји комплементарност или супституција између домаћих инвестиција и страних директних инвестиција у Боцвани. Резултати показују да позитивни шокови у приливима страних директних инвестиција допуњују домаће инвестиције у кратком року, али их у дугом року замјењују, док су негативни шокови у приливима страних директних инвестиција статистички безначајни без обзира на посматрани временски период. Позитивни шокови у одливима страних директних инвестиција замјењују домаће инвестиције у дугом року, док их у кратком року допуњују. С друге стране, негативни шокови у одливима страних директних инвестиција изазивају позитивну промјену у домаћим инвестицијама у дугом року, али су у кратком року без значајног утицаја. У раду се такође разматрају импликације за економску политику.

**Кључне ријечи:** приливи страних директних инвестиција; одливи страних директних инвестиција; Боцвана; нелинеарни ауторегресивни модел расподијељених кашњења (NARDL); инвестициона политика.

