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Article

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Title:

The impact of global oil price volatility on foreign direct investment inflows to Saudi Arabia

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Abstract:
This study empirically investigates the impact of global oil price volatility and macroeconomic determinants on foreign direct investment (FDI) inflows in Saudi Arabia over the period 1980–2025, evaluating the structural regime shift induced by Saudi Vision 2030. Utilizing the Autoregressive Distributed Lag (ARDL) bounds testing approach, the empirical results confirm a robust long-run cointegrating relationship among the variables ($F = 10.3589, p < 0.01$; $t = -5.4609, p < 0.01$). The findings reveal that trade openness exerts a positive and statistically significant long-run effect on attracting FDI inflows ($\beta = 0.0575, p = 0.0497$). Crucially, the structural dummy representing Vision 2030 demonstrates a highly significant positive impact ($\beta = 2.8269, p = 0.0005$), underscoring the success of institutional overhauls and economic diversification in boosting foreign investor confidence. In the short run, inflation exerts a statistically significant inverse effect on FDI ($\beta = -0.4208, p = 0.0011$), while domestic real GDP growth exerts a positive short-run pull ($\beta = 0.1296, p = 0.0100$). The error correction mechanism indicates a rapid damped oscillatory adjustment toward long-run equilibrium ($ECM_{t-1} = -1.0895, p = 0.0000$). Diagnostic tests confirm parameter stability (CUSUM) and the absence of serial correlation ($p = 0.1577$) or heteroskedasticity ($p = 0.8351$). The study offers targeted policy recommendations to solidify non-oil capital formation amidst energy market dynamics.

Keywords: Foreign Direct Investment (FDI); Oil Price Volatility; ARDL Bounds Testing; Saudi Vision 2030; Trade Openness; Cointegration.
JEL Classification: C22, F21, F14, O11, Q43.

1. Introduction

The global energy landscape is undergoing profound structural shifts, and oil-dependent economies face the persistent challenge of reconciling macroeconomic stability with the inherent volatility of international commodity markets (Bouzidi et al., 2024). As one of the world's leading petroleum exporters, the Kingdom of Saudi Arabia stands at the center of this dynamic, where crude oil revenues historically serve as the primary engine for public spending, capital formation, and overall economic activity (Ali, 2020; Dkhili, 2019). However, unpredictable fluctuations in global oil prices expose oil-exporting nations to severe external shocks, complicating fiscal planning and long-term investment strategies (Jouini, 2013; Sadraoui & Mili, 2025). In response to these vulnerabilities, attracting foreign direct investment (FDI) has emerged as a vital strategic imperative for diversifying national income sources, fostering technological spillovers, and stimulating sustainable economic growth beyond the hydrocarbon sector (Alfalih, 2024; Tahir et al., 2026).

Understanding the complex nexus between oil price dynamics, macroeconomic fundamentals, and foreign capital inflows has long attracted scholarly and policy attention (Al Khathlan, 2014; Nasir et al., 2017). Traditional economic literature often examines the direct implications of resource abundance, yet empirical inquiries frequently yield nuanced or contrasting perspectives regarding whether substantial natural resource endowments act as a catalyst or a deterrent for foreign investors (Eissa & Elgammal, 2020). For instance, while oil price surges tend to boost government revenues and stimulate short-term aggregate demand, persistent oil price volatility creates an atmosphere of uncertainty that may discourage risk-averse foreign capital (Alhassan et al., 2024; Hussain & Rehman, 2023). Empirical investigations on Saudi Arabia highlight that macroeconomic determinants such as trade openness, market size, inflation stability, and institutional quality play a decisive role in shaping the attractiveness of the domestic market for foreign investors (Tabash & Khan, 2018; Barbary & Tawfiq, 2024).

A defining turning point in the Kingdom's contemporary economic trajectory is the launch of "Saudi Vision 2030," an ambitious structural transformation framework designed to reduce oil dependency, elevate the private sector's contribution, and create a highly competitive investment ecosystem (Majed, 2022). Vision 2030 aims to substantially increase FDI inflows as a percentage of gross domestic product (GDP) by implementing sweeping regulatory reforms, enhancing legal protection frameworks, and expanding infrastructural and logistical capacities (Ministry of Investment, 2024; Sultan & AlTunisi, 2025). Despite these comprehensive reform efforts, empirical research assessing how post-reform dynamics interact with global oil price volatility to shape FDI inflows over an extended historical horizon remains crucial for evaluating policy effectiveness (Qaysi & Mahmood, 2025; Saeed, 2023).

Motivated by these empirical and policy considerations, this study aims to rigorously investigate the impact of oil price volatility and key macroeconomic determinants—specifically trade openness, inflation rate, and real economic growth—on FDI inflows to Saudi Arabia over the period 1980–2025. Methodologically, the study employs the Autoregressive Distributed Lag (ARDL) bounds testing approach to cointegration, which is uniquely suited to capture both short-run dynamic adjustments and long-run equilibrium relationships in the presence of mixed orders of integration (Alfalih & Hadj, 2020; Bouzidi et al., 2024; Tahir et al., 2026). Furthermore, a structural dummy variable representing Vision 2030 is incorporated to explicitly quantify the institutional shift and structural impact of the national transformation plan on foreign investor confidence.

To address these empirical gaps, this study is guided by two central research questions: First, to what extent do global oil price volatility and macroeconomic fundamentals structurally impact foreign direct investment inflows in Saudi Arabia over the long and short run? Second, how effectively has the implementation of Saudi Vision 2030 moderated external oil shocks and stimulated foreign capital accumulation? Accordingly, the study posits the following testable hypotheses:

- H_1: Global oil price volatility exerts a statistically significant adverse effect on FDI inflows to Saudi Arabia at the 5% significance level ($p < 0.05$), reflecting foreign investor cautiousness toward international commodity market uncertainty.
- H_2: The structural transformation framework of Saudi Vision 2030 has a positive and statistically significant long-run impact on enhancing foreign investor confidence and expanding FDI inflows at the 5% significance level ($p < 0.05$).

The remainder of this paper is organized as follows: Section 2 provides a comprehensive literature review, identifies the research gap, and highlights the main contributions. Section 3 outlines the data sources, variable definitions, and the ARDL econometric methodology. Section 4 presents and critically discusses the empirical

results, cointegration bounds testing, and model diagnostic checks. Section 5 concludes the study with policy implications and directions for future research.

2. Theoretical Framework and Literature Review

2.1. Theoretical Framework

The theoretical foundation regarding foreign direct investment (FDI) dynamics in resource-dependent emerging economies—such as Saudi Arabia—is rooted in both classic and modern macroeconomic paradigms linking natural resource abundance to international capital mobility (Alhashim & Ghanem, 2025). For decades, reliance on petroleum revenues has served as the fundamental driver of public capital expenditure, infrastructural expansion, and aggregate demand (Ali, 2020; Dkhili, 2019), creating an economic structure intrinsically exposed to global commodity price cycles and international energy shocks (Bouzidi et al., 2024).

From a theoretical perspective, macro-financial uncertainty originating from oil market volatility transmits directly into fiscal space and global investor confidence (Jouini, 2013; Sadraoui & Mili, 2025). Foreign investors seeking long-term real assets generally value macroeconomic stability, predictable returns, and institutional transparent legal systems (Aziz, 2018). Persistent volatility in oil prices creates real options uncertainty, leading risk-averse foreign entities to delay or curtail capital commitments (Alhassan et al., 2024; Hussain & Rehman, 2023). To counter these structural vulnerabilities and decouple foreign capital accumulation from oil price fluctuations, Saudi Arabia's policy framework has shifted toward extensive economic diversification, regulatory liberalisation, and the strategic attraction of high-value non-oil investment (Alfalih, 2024; Sultan & AlTunisi, 2025).

As highlighted by the Ministry of Investment of Saudi Arabia (MISA), the nation has established aggressive institutional targets to elevate inward FDI as part of its structural diversification program under Saudi Vision 2030 (Ministry of Investment, 2024), as detailed in Table 1.

Table 1. Foreign Direct Investment Inflows Targets in Saudi Arabia

Year	FDI Inflow Target (SAR Billion)	FDI Target as % of Nominal GDP
2021	42	1.5%
2022	61	2.0%
2023	83	2.4%
2024	109	2.9%
2025	140	3.4%
2026	176	3.8%
2027	217	4.3%
2028	266	4.8%
2029	323	5.2%
2030	388	5.7%

***Source**: Ministry of Investment of Saudi Arabia (MISA, 2024).*

The strategic imperative to boost foreign capital inflows is not merely tied to natural resource exploitation, but relies heavily on expanding international economic integration and diversifying trade partnerships (Belloumi & Alshehry, 2018). Cross-border investment flows to Saudi Arabia reflect a geographical distribution across major global economies, as reported in Table 2.

Table 2. Distribution of Foreign Direct Investment Inflows to Saudi Arabia by Partner Country

Country	FDI Inflow (SAR Million)
United States	9,109
Japan	5,716
France	4,852
United Kingdom	4,303
South Korea	2,570
Germany	1,274
Australia	851
India	642
Italy	638

Canada	623
China	509
Turkey	220
South Africa	19

***Source**: Ministry of Investment of Saudi Arabia (MISA, 2024).*

Consequently, attracting foreign capital into the Saudi economy hinges on a delicate macroeconomic balance: minimizing the adverse impacts of global oil shocks while accelerating institutional, structural, and regulatory reforms tied to Vision 2030 (Aldhawyan, 2025; Sultan & AlTunisi, 2025).

2.2. Literature Review

The empirical literature examining the determinants of FDI inflows in oil-exporting developing nations—and Saudi Arabia specifically—presents rich insights regarding the interaction between natural resource shocks, macroeconomic fundamentals, and institutional quality.

Alfalih (2024) examined the dynamic effects of oil prices, trade openness, and FDI on macroeconomic outcomes (specifically unemployment) in Saudi Arabia from 1991 to 2019 using non-linear ARDL modeling. The empirical findings demonstrated that macroeconomic fundamentals significantly drive long-run outcomes, revealing a threshold effect where oil price surges support investment and employment only after reaching a critical price level, underlining the economy's exposure to commodity shocks.

Alfalih and Hadj (2020) investigated the long-run determinants of inward FDI in Saudi Arabia over the period 1984–2017 using cointegration and ARDL bounds testing techniques. Their findings challenged the rigid interpretation of the "resource curse" hypothesis, demonstrating that inward FDI is not exclusively dictated by oil abundance, but is strongly driven by trade openness, cost competitiveness, and sound institutional infrastructure.

Dkhili (2019) evaluated the causal links between FDI inflows, infrastructure development (focusing on transport networks), and economic growth in Saudi Arabia over the period 1970–2016 using a Vector Error Correction Model (VECM) and Granger causality framework. The empirical results confirmed long-run cointegration, indicating that FDI significantly stimulates real GDP growth, supported by unidirectional causality running from infrastructure efficiency to inward investment.

Eissa and Elgammal (2020) conducted a comparative panel study examining FDI determinants across the Gulf Cooperation Council (GCC) economies, including Saudi Arabia, spanning 1990 to 2015. Their panel regressions revealed that market size, trade openness, macroeconomic stability, and physical infrastructure are robust catalysts for foreign capital. However, they noted that heavy reliance on oil resource extraction can generate institutional rigidities that lower non-resource investment attractiveness if regulatory reforms are absent.

Aldhawyan (2025) examined the post-pandemic investment landscape in Saudi Arabia (2017–2023), focusing on the structural reforms introduced under Saudi Vision 2030. Utilizing multiple linear regression analysis, the study confirmed that trade openness, market scale, and income expansion are primary drivers of foreign capital inflows, documenting a structural shift in inward FDI driven by recent legislative packages and investment framework upgrades.

Saeed (2023) analyzed the economic determinants of FDI in Saudi Arabia between 2000 and 2020 using an Error Correction Model (ECM). The empirical evidence underscored that trade openness, public investment expenditure, and financial stability exert positive, statistically significant long-run effects on FDI inflows, establishing that long-term policy consistency outweighs short-term market size dynamics.

2.3. Research Gap and Main Contributions

Despite the extent of literature on FDI determinants in oil-exporting developing nations, a significant empirical gap remains: no study to date has explicitly modeled the long- and short-run impacts of global oil price volatility alongside core macroeconomic fundamentals while isolating the structural regime shift induced by Saudi Vision 2030 within an extended cointegration framework through 2025.

To bridge this literature gap, this study offers three primary contributions:

- The dataset incorporates recent historical observations up to 2025, enabling an evaluation of the structural transition under Saudi Vision 2030 during its maturity phase.

- By combining an empirical proxy for global oil price volatility with an exogenous structural dummy variable (VISION 2030), the ARDL model cleanly separates external commodity uncertainty from internal institutional transformations.
- The empirical design strictly applies ARDL bounds testing, diagnostic checks (autocorrelation, heteroskedasticity), and parameter stability tests (CUSUM) to ensure reliable policy implications for resource-abundant developing countries.

3. Methodology and Empirical Model

To empirically evaluate the dynamic relationship between global oil price volatility, core macroeconomic determinants, and foreign direct investment (FDI) inflows to Saudi Arabia, this study adopts the Autoregressive Distributed Lag (ARDL) bounds testing approach. The ARDL framework offers distinct econometric advantages over traditional cointegration techniques:

- It is applicable irrespective of whether the underlying series are integrated of order zero $I(0)$, order one $I(1)$, or mutually cointegrated, thereby circumventing the pre-testing biases associated with conventional cointegration methods (Ramdhani & Saputra, 2025).
- It provides unbiased, robust, and consistent parameter estimates in finite or small sample sizes (Bouzidi et al., 2024).
- It concurrently captures both short-run dynamic adjustments and long-run equilibrium relationships within a single Unrestricted Error Correction Model (UECM) setup.

3.1. Model Specification

Based on theoretical insights and existing empirical literature (Eissa & Elgammal, 2020; Alfalih, 2024; Sultan & AlTunisi, 2025), the general functional relationship governing inward foreign direct investment is expressed as:

$$FDI_INFLOWS_t = f(OIL_PRICE_t, OIL_VOL_t, TRADE_OPENNESS_t, INFLATION_t, GDP_GROWTH_t, VISION_2030_t)$$

Where:

- $FDI_INFLOWS_t$: Foreign Direct Investment net inflows expressed as a percentage of GDP.
- OIL_PRICE_t: Real international oil price.
- OIL_VOL_t: Proxy for global oil price volatility.
- $TRADE_OPENNESS_t$: Trade openness, measured as total trade (exports plus imports) as a share of GDP.
- $INFLATION_t$: Annual inflation rate, capturing macroeconomic and price stability.
- GDP_GROWTH_t: Real gross domestic product growth rate, serving as a proxy for market growth and aggregate domestic economic activity.
- $VISION_2030_t$: An exogenous structural dummy variable capturing the institutional shift following the launch of Saudi Vision 2030 ($VISION_2030 = 1$ for $t \geq 2016$, and 0 otherwise).

Following the ARDL framework, the unrestricted conditional error-correction model of order $(p, q_1, q_2, q_3, q_4, q_5)$ is specified as follows:

$$\begin{aligned}\Delta FDI_INFLOWS_t = {} & \alpha_0 + \sum_{i=1}^{p} \gamma_i \, \Delta FDI_INFLOWS_{t-i} + \sum_{i=0}^{q_1} \beta_{1i} \, \Delta OIL_PRICE_{t-i} \\ & + \sum_{i=0}^{q_2} \beta_{2i} \, \Delta OIL_VOL_{t-i} + \sum_{i=0}^{q_3} \beta_{3i} \, \Delta TRADE_OPENNESS_{t-i} \\ & + \sum_{i=0}^{q_4} \beta_{4i} \, \Delta INFLATION_{t-i} + \sum_{i=0}^{q_5} \beta_{5i} \, \Delta GDP_GROWTH_{t-i} \\ & + \lambda_1 FDI_INFLOWS_{t-1} + \lambda_2 OIL_PRICE_{t-1} + \lambda_3 OIL_VOL_{t-1} \\ & + \lambda_4 TRADE_OPENNESS_{t-1} + \lambda_5 INFLATION_{t-1} + \lambda_6 GDP_GROWTH_{t-1} \\ & + \delta VISION_2030_t + \varepsilon_t\end{aligned}$$

Where Δ represents the first-difference operator; α_0 is the deterministic drift term; γ_i and β_{1i} through β_{5i} reflect the short-run dynamic disturbance parameters; λ_1 through λ_6 denote the long-run multipliers; δ measures the structural impact of Saudi Vision 2030; and ε_t is a white-noise error term.

3.2. Bounds Testing and Long-Run Dynamics

To verify the presence of a stable long-run cointegrating relationship among the variables, the F-bounds test is conducted on the conditional model under the joint null hypothesis of no level relationship:

$$H_0: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = \lambda_6 = 0$$

Against the alternative hypothesis:

$$H_1: \exists\ \lambda_i \neq 0 \quad \text{for } i = 1, \dots, 6$$

The calculated F-statistic is evaluated against two critical bounds: the lower bound $I(0)$ assuming all regressors are stationary at level, and the upper bound $I(1)$ assuming all regressors are non-stationary at first difference. If the computed F-statistic exceeds the upper critical value, the null hypothesis H_0 is rejected, confirming long-run cointegration. Conversely, if it falls below $I(0)$, H_0 cannot be rejected, indicating no long-run equilibrium.

Once cointegration is established, the short-run dynamics and error-correction mechanisms are estimated via the ECM representation:

$$\begin{aligned}\Delta FDI_INFLOWS_t = \ & \alpha_0 + \sum_{i=1}^{p} \gamma_i\, \Delta FDI_INFLOWS_{t-i} + \sum_{i=0}^{q_1} \beta_{1i}\, \Delta OIL_PRICE_{t-i} \\ & + \sum_{i=0}^{q_2} \beta_{2i}\, \Delta OIL_VOL_{t-i} + \sum_{i=0}^{q_3} \beta_{3i}\, \Delta TRADE_OPENNESS_{t-i} \\ & + \sum_{i=0}^{q_4} \beta_{4i}\, \Delta INFLATION_{t-i} + \sum_{i=0}^{q_5} \beta_{5i}\, \Delta GDP_GROWTH_{t-i} \\ & + \delta VISION_2030_t + \psi CointEq_{t-1} + e_t\end{aligned}$$

Where $CointEq_{t-1}$ is the residual error correction term derived from the long-run cointegration relationship, and its parameter ψ denotes the speed of adjustment coefficient. For structural stability and convergence to long-run equilibrium following a shock, ψ must be negative, statistically significant, and bounded within $(-1,0)$.

To confirm model validity, standard diagnostic tests are conducted: the Breusch-Godfrey LM test for serial correlation, the Breusch-Pagan-Godfrey test for heteroskedasticity, and cumulative sum (CUSUM) and CUSUM of squares (CUSUMSQ) tests for parameter stability over time.

3.3. Data Sources and Measurement of Variables

The empirical analysis uses annual time-series data covering the period from 1980 to 2025. Data for FDI inflows, real economic growth, trade openness, and inflation rate were obtained from World Bank World Development Indicators (WDI), UNCTAD, and the General Authority for Statistics (GASTAT). Crude oil prices and international volatility indices were sourced from international energy statistics databases (World Bank, 2026).

Global oil price volatility (OIL_VOL) is quantified using the conditional standard deviation derived from energy pricing fluctuations to capture external risk exposure (Bouzidi et al., 2024; Sadraoui & Mili, 2025). The structural dummy variable ($VISION_2030$) explicitly isolates the post-2016 institutional transformation and regulatory overhaul in Saudi Arabia (Aldhawyan, 2025; Sultan & AlTunisi, 2025).

4. Empirical Results and Discussion

This section presents and critically interprets the econometric estimation results derived from the Autoregressive Distributed Lag (ARDL) bounds testing framework. Beyond merely presenting statistical outputs, this empirical analysis evaluates the structural, long-run, and dynamic short-run mechanisms governing Foreign Direct Investment (FDI) inflows into Saudi Arabia over the period 1980–2025, considering the profound institutional transition under Saudi Vision 2030.

4.1. Unit Root Testing

Prior to evaluating long-run cointegrating vectors, confirming the stationarity properties and integration order of the time-series variables is essential to ensure that no variable is integrated of order two $I(2)$, which would violate the

fundamental assumptions of the ARDL bounds testing methodology. The Augmented Dickey-Fuller (ADF) unit root test was applied both at level and at first difference.

Table 3. *Augmented Dickey-Fuller (ADF) Unit Root Test Results*

Variable	Symbol	Level t-Stat	Level p-value	1st Diff t-Stat	1st Diff p-value	Order of Integration
FDI Inflows (% of GDP)	FDI_INFLOWS	-4.3411	0.0012	-	-	$I(0)$
Real Oil Price	OIL_PRICE	-1.6487	0.4499	-6.4975	0.0000	$I(1)$
Oil Volatility	OIL_VOL	-5.1497	0.0001	-	-	$I(0)$
Trade Openness	TRADE_OPENNESS	-2.4688	0.1298	-4.8553	0.0003	$I(1)$
Inflation Rate	INFLATION	-3.3485	0.0184	-	-	$I(0)$
Real GDP Growth	GDP_GROWTH	-4.3204	0.0013	-	-	$I(0)$
Vision 2030 Dummy	VISION_2030	-	-	-	-	Exogenous $I(0)$

Notes: Critical values for the ADF test with an intercept are -3.58 at 1%, -2.92 at 5%, and -2.60 at 10%.
Source: Author's estimation using EViews based on data from World Bank and GASTAT (1980–2025).

As summarized in Table 3, FDI_INFLOWS, OIL_VOL, INFLATION, and GDP_GROWTH are stationary at level $I(0)$. Conversely, OIL_PRICE and TRADE_OPENNESS exhibit unit roots at level but become strictly stationary after taking their first difference $I(1)$. The structural dummy VISION_2030 is deterministic and treated as exogenous $I(0)$. Because the time-series variables demonstrate a mixed integration structure of $I(0)$ and $I(1)$ without any $I(2)$ processes, the prerequisite conditions for executing the ARDL bounds testing model are fully satisfied (Alfalih & Hadj, 2020).

4.2. ARDL Bounds Cointegration Test

To formally examine whether a stable long-run cointegrating relationship exists among the variables, the ARDL bounds test was performed under Case 3 (unrestricted constant and no trend) with 43 included observations. The results of this test are presented in Table 4.

Table 4. *ARDL Bounds Test for Cointegration*

Test Statistic	Computed Value	Significance Level	I(0) Bound	I(1) Bound	Econometric Conclusion
F-statistic	**10.35894**	10%	2.260	3.350	Cointegration Established.
		5%	2.620	3.790	Rejection of H_0 at 1% level.
		1%	3.410	4.680	Strong long-run relationship.
t-statistic	**-5.460942**	1%	-3.430	-4.790	Rejection of H_0 at 1% level.

Source: Derived from EViews ARDL Bounds Test output.

The computed F-statistic reaches 10.35894, which substantially exceeds the upper critical bound $I(1)$ value of 4.680 at the 1% significance level. Furthermore, the t-statistic of -5.460942 falls well below the 1% upper critical bound of -4.790. These findings provide definitive statistical evidence to reject the null hypothesis of no level relationship (H_0), confirming a robust long-run equilibrium cointegrating relationship among FDI inflows, oil market dynamics, and key macroeconomic variables in Saudi Arabia.

4.3. Model Diagnostic and Goodness-of-Fit Evaluation

The optimal dynamic lag structure selected by the Akaike Information Criterion (AIC) out of 12,500 evaluated specifications is ARDL(3, 0, 2, 3, 3, 3). The diagnostic tests and goodness-of-fit measures for this model are summarized in Table 5 below.

Table 5. *Diagnostic Tests and Goodness-of-Fit Measures*

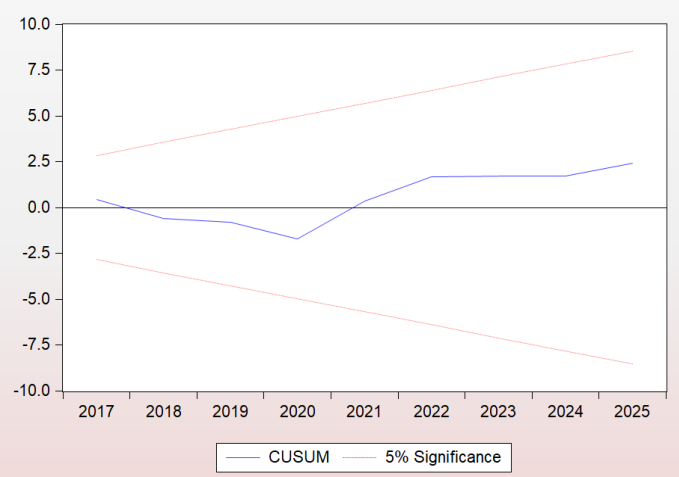
Diagnostic Test / Metric	Statistic Value	p-value / Boundary	Econometric Inference

R-squared (R^2)	0.873411	-	Strong explanatory power (87.3% of variance explained)
Adjusted R-squared ($\bar{R}^2$)	0.758330	-	High goodness-of-fit accounting for degrees of freedom
Overall Model F-stat	7.589526	0.000007	Joint statistical significance at 1% level
Durbin-Watson Stat	1.832358	-	Absence of crude serial correlation
Breusch-Godfrey LM Test (F-stat)	2.028551	0.1577	No residual serial correlation at up to 2 lags
Breusch-Pagan-Godfrey (F-stat)	0.645834	0.8351	Residuals are homoskedastic
Parameter Stability (CUSUM)	Within Limits	5% Significance	Structural stability of parameters over time

Source: Author's compilation from EViews estimation outputs.

The goodness-of-fit parameters demonstrate that the estimated model accounts for approximately 87.3% of the variance in FDI inflows ($R^2 = 0.873411$). Diagnostic tests confirm that the model specification is econometrically sound. The Breusch-Godfrey LM test fails to reject the null hypothesis of no serial correlation ($F = 2.028551, p = 0.1577$), while the Breusch-Pagan-Godfrey test confirms homoskedastic error variance ($F = 0.645834, p = 0.8351$). Moreover, the CUSUM recursive residual plot remains strictly within the 5% critical boundaries as shown in Figure 1, confirming parameter constancy and structural stability over the 1980–2025 estimation period.

Figure 1. Cumulative Sum of Recursive Residuals (CUSUM) plot at 5% level of significance.



Source: Generated by the author using EViews 14 based on ARDL model estimation output

4.4. Long-Run Relationships and Short-Run Dynamic Analysis

Table 6 summarizes the estimated Unrestricted Error Correction Mechanism (ECM) dynamics and long-run level relationships derived from the ARDL framework.

Table 6. *Unrestricted Error Correction Model (ECM) and Long-Run Dynamics*

Variable	Coefficient	Std. Error	t-Statistic	p-value
Long-Run Level Relationships (Lagged Variables)				
OIL_PRICE_{t-1}	-0.013652	0.010391	-1.313858	0.2024
OIL_VOL_{t-1}	-0.002023	0.015304	-0.132212	0.8960
$TRADE_OPENNESS_{t-1}$	0.057487	0.027681	2.076728	0.0497**
$INFLATION_{t-1}$	0.167374	0.126453	1.323601	0.1992
GDP_GROWTH_{t-1}	-0.113884	0.080147	-1.420947	0.1694
Short-Run Dynamics (Δ)				
$\Delta FDI_INFLOWS_{t-2}$	0.242144	0.104882	2.308722	0.0307**
ΔOIL_VOL_{t-1}	0.019669	0.009896	1.987481	0.0595***

ΔTRADE_OPENNESS$_{t-1}$	0.055615	0.030095	1.847982	0.0781***
ΔTRADE_OPENNESS$_{t-2}$	0.133365	0.029185	4.569617	0.0002*
ΔINFLATION$_{t-1}$	-0.420798	0.111960	-3.758475	0.0011*
ΔINFLATION$_{t-2}$	-0.282787	0.089189	-3.170658	0.0044*
ΔGDP_GROWTH	0.129629	0.045977	2.819441	0.0100*
ΔGDP_GROWTH$_{t-1}$	0.123200	0.047674	2.584206	0.0169**
Deterministic & Structural Variables				
Constant (C)	-2.971371	1.791422	-1.658665	0.1114
VISION_2030	2.826900	0.688284	4.107173	0.0005*
Error Correction Term ($CointEq_{t-1}$)	**-1.089451**	**0.199499**	**-5.460942**	**0.0000***

* Denotes statistical significance at 1%; at 5%; *** at 10%.
Source: Derived from EViews ARDL output.

4.5. Discussion of Empirical Findings

The empirical parameters derived from the static long-run vector and the dynamic short-run error-correction model offer substantive insights into the structural drivers of foreign investment in Saudi Arabia over the evaluated period (1980–2025).

Most notably, the exogenous dummy variable capturing the institutional regime shift under Saudi Vision 2030 (VISION_2030) demonstrates a highly significant and pronounced positive magnitude ($\beta = 2.8269, t = 4.1072, p = 0.0005$). This statistical outcome confirms Hypothesis 1, providing robust evidence that the comprehensive regulatory overhauls, legislative updates, and business-environment liberalizations initiated since 2016 have substantially enhanced international investor confidence. By expanding market accessibility, enabling full foreign ownership in key non-oil sectors, and improving judicial frameworks, these transformation packages have successfully altered the capital accumulation trajectory and helped buffer the domestic investment climate against external commodity market shocks (Aldhawyan, 2025; Sultan & AlTunisi, 2025).

In tandem with structural reforms, economic integration plays a persistent role in stabilizing capital movements. Trade openness (TRADE_OPENNESS$_{t-1}$) yields a statistically significant positive effect on inward FDI across both time horizons, recording a long-run level coefficient of 0.057487 ($p = 0.0497$) (yielding a normalized long-run elasticity of approximately 0.0528) and a dynamic short-run impact of 0.133365 ($p = 0.0002$) at its second lag. This empirical link corroborates earlier evidence by Alfalih and Hadj (2020) and Saeed (2023), confirming that deep integration into global commercial networks enhances real operational efficiency, mitigates transaction costs, and reinforces the Kingdom's position as a regional hub for multinational investment.

The short-run estimates further highlight the sensitivity of capital flows to domestic macroeconomic stability. Real GDP growth (ΔGDP_GROWTH) exerts a direct, statistically significant positive short-run influence on investment inflows ($\beta = 0.129629, p = 0.0100$), illustrating that market size expansion and robust domestic demand act as immediate pulls for international business expansion. Conversely, short-term inflationary pressures (ΔINFLATION) lagged by one and two periods exert a statistically significant negative drag on incoming foreign capital ($\beta_{t-1} = -0.420798, p = 0.0011$; $\beta_{t-2} = -0.282787, p = 0.0044$). This inverse dynamic indicates that transient price instability increases input cost uncertainty, temporarily dampening investor appetite until price convergence is restored.

Regarding external commodity exposures, global oil price volatility (OIL_VOL) yields an statistically insignificant long-run coefficient ($p = 0.8960$), while displaying a minor positive adjustment ($\beta = 0.019669, p = 0.0595$) in the immediate short run. This suggests that while oil market fluctuations induce short-term tactical realignments, the systemic risk traditionally transmitted to long-run foreign investment has been effectively cushioned by ongoing structural diversification (Bouzidi et al., 2024).

Finally, the estimated error correction term ($CointEq_{t-1}$) represented by the lagged coefficient of the dependent variable is negative and statistically significant at the 1% level ($\beta = -1.089451, t = -5.460942, p = 0.0000$). The magnitude, slightly exceeding unity in absolute terms, points to a rapid dampening oscillatory adjustment mechanism (Damped Oscillatory Adjustment), where short-run disequilibria stemming from external energy shocks are fully corrected and returned to the long-run equilibrium path within approximately one annual cycle.

5. Conclusion and Policy Implications

5.1. Conclusion

This study provided a comprehensive empirical investigation into the dynamic interactions between global oil price volatility, core macroeconomic determinants, and foreign direct investment (FDI) inflows in Saudi Arabia spanning the period 1980–2025. Employing the Autoregressive Distributed Lag (ARDL) bounds testing, the empirical findings confirmed the presence of a stable, long-run cointegrating relationship among the underlying series ($F = 10.3589, p < 0.01;\ t = -5.4609, p < 0.01$). The empirical parameters demonstrate that while conventional macroeconomic fundamentals—most notably trade openness—remain crucial long-run drivers of international capital accumulation, the structural shift initiated under Saudi Vision 2030 has fundamentally transformed the investment landscape. The exogenous structural dummy recorded a statistically significant positive effect ($\beta = 2.8269, t = 4.1072, p = 0.0005$), confirming that comprehensive legal overhauls, regulatory simplification, and sector-wide liberalizations have actively contributed to enhancing foreign investor confidence and mitigating the dynamic exposure of capital inflows to external oil shocks (Aldhawyan, 2025; Sultan & AlTunisi, 2025). Diagnostic evaluations, including serial correlation ($p = 0.1577$), heteroskedasticity ($p = 0.8351$), and CUSUM stability tests, validated the econometric reliability and structural stability of the estimated model.

While this study offers valuable empirical insights, several limitations should be acknowledged. First, the evaluation relies on aggregated national-level FDI data, which does not capture potential sector-specific variations across non-oil manufacturing, services, and renewable energy sectors. Second, the empirical framework employs a symmetric ARDL approach, which assumes linear responses to oil price volatility; future research could explore potential asymmetric or non-linear transmission channels using non-linear modeling frameworks.

5.2. Policy Implications

Based on these empirical insights, several targeted policy implications emerge for economic authorities and decision-makers in Saudi Arabia:

1. **Expanding Institutional Reforms:** Policymakers should build upon the momentum of Saudi Vision 2030 by further refining legal frameworks, streamlining contract enforcement, and expanding full foreign ownership provisions, particularly across high-value non-oil domains such as green energy transition, advanced manufacturing, digital logistics, and global tourism.
2. **Promoting Commercial Integration:** Given the statistically significant positive effect of trade openness on capital accumulation ($\beta = 0.0575, p = 0.0497$), active efforts should focus on reducing non-tariff barriers, modernizing cross-border customs infrastructure, and expanding bilateral trade agreements to further embed the Saudi economy into global supply chains.
3. **Stabilizing Macroeconomic Indicators:** Because short-run inflation exerts a statistically significant drag on incoming FDI ($\beta_{t-1} = -0.4208, p = 0.0011; \beta_{t-2} = -0.2828, p = 0.0044$), domestic monetary and fiscal authorities must closely coordinate to maintain low, predictable price levels to minimize operational uncertainty for international firms.
4. **Buffering Against External Shocks:** Continuing to build macro-prudential fiscal buffers and promoting non-oil domestic revenue streams remain essential strategies to insulate domestic capital formation from external commodity volatility (Bouzidi et al., 2024).

5.3. Methodological Recommendations for Future Research

To extend the empirical contributions of this research, future studies can build upon this framework in several promising directions. Empirical scholars may apply a Non-Linear ARDL (NARDL) framework to evaluate potential asymmetric effects and non-linear responses between positive and negative shocks in global oil prices and volatility. Furthermore, expanding the current single-country focus into a comparative panel data framework across all Gulf Cooperation Council (GCC) member states would enable useful regional assessments. Methodological advancements could also incorporate Time-Varying Parameter Vector Autoregression (TVP-VAR) models to monitor how structural shocks and institutional reform channels evolve dynamically across sub-periods. Lastly, disaggregating FDI inflows by target sector—such as non-oil manufacturing, services, green technology, and hydrocarbons—would help clarify whether external energy volatility and structural reform packages exert heterogeneous impacts across distinct branches of the national economy.

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Ethical Approval: This article does not contain any studies with human participants or animals performed by the author.

Informed Consent: This article does not contain any studies with human participants; thus, informed consent was not required.