The Role of FDI, Credit to Private, Government Investment, and Oil Prices in Saudi Arabia's Non-Oil Economic Growth.

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Abstract

This paper empirically examines the roles of FDI, credit to the private sector, government investment, and oil prices on Saudi Arabia's non-oil GDP from 1991 to 2023 by using an ARDL bound test with an error correction model to analyze both short-term and long-term effects. The results reveal a long-term relationship between the regressors and the dependent variable. Specifically, credit and oil prices significantly contribute to non-oil growth, while FDI and government investment have insignificant effects.

Declaration

I hereby declare that this thesis represents my/our own work.

I have read and applied the current research ethics guidelines concerning the use of artificial intelligence (AI) tools in this work, as outlined in the General Course Information. In the preparation of this work, the author(s) utilized the following AI tools, specifying the purpose for their use. Please list all ways in which you have used AI.

ChatGPT was used to generate ideas, clarify general concepts, code, and improve text clarity, flow, and consistency.

Grammarly was used to correct grammar, spelling, synonyms, and improve the academic tone.

As author, I have reviewed and edited the content as needed and take full responsibility for the content of the thesis.

Signature: 

Date: 2026.01.04

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1. Introduction

Saudi Arabia's long-term growth has been shaped by its heavy reliance on hydrocarbon revenues, which have historically made up most of the government's income and foreign exchange earnings. While this resource base has supported rapid development and large public investments, it has also made the economy vulnerable to external shocks and limited the growth of non-oil sectors. In response, Saudi Arabia launched Vision 2030 (Vision 2030, 2016), an ambitious reform plan aimed at reducing oil dependence, modernizing institutions, and creating a diverse, private sector-driven economy. Achieving these goals requires a clear empirical understanding of how key macroeconomic factors, such as foreign direct investment (FDI), private-sector credit, fixed capital formation, and oil price dynamics, jointly affect an economy in transition. Although recent years have seen notable progress in employment and non-oil economic activity (IMF, 2024), policymakers still face uncertainty regarding the channels through which macroeconomic forces impact diversification outcomes.

An extensive body of empirical and theoretical literature exists on factors affecting growth. Foreign direct investment is widely understood to promote technology transfer, productivity spillovers, and knowledge diffusion when supported by adequate human capital (Borensztein et al., 1998). Models examining how FDI and public expenditure interact to affect growth highlight that FDI depends on the composition of public spending (Le & Suruga, 2005). Financial development underscores the importance of credit allocation and intermediation in promoting entrepreneurship and efficient investment (King & Levine, 1993). In resource-rich economies, government spending, particularly on infrastructure and human capital, plays a key role in expanding non-oil productive capacity, and fluctuations in these markets can have a considerable impact on the broader economy (IMF, 2012).

Despite these contributions, existing empirical studies have examined factors affecting economic growth across different contexts and time frames and have measured growth using different dependent variables. As a result, there has been limited attention to assessing the influence of multiple factors on non-oil economic performance, specifically in Saudi Arabia.

This thesis sheds light on this gap by examining the effects of foreign direct investment (FDI), private sector credit, government fixed capital formation, and oil-price dynamics on non-oil GDP growth in Saudi Arabia from 1991 to 2023. Using an autoregressive Distributed Lag (ARDL) bound testing and an error-correction framework, this allows for capturing both short-run and long-run relationships, thereby offering a comprehensive analysis of the mechanisms driving growth.

The empirical findings demonstrate that oil prices and private sector credit have statistically significant long-run effects on non-oil GDP. These results indicate that, despite the implementation of Vision 2030, the oil sector continues to play a central role in supporting non-oil sectors. The findings also underscore the importance of private credit, which enables firms to enhance efficiency and achieve greater growth potential by alleviating capital constraints. In contrast, the analysis finds no evidence that FDI inflows or government fixed capital formation have long-run effects on non-oil GDP, suggesting persistent challenges related to investment composition, absorptive capacity, and public spending efficiency. Short-run adjustments are primarily influenced by lagged FDI dynamics. Collectively, these results emphasize the ongoing significance of oil-linked fiscal capacity and domestic credit markets in shaping non-oil growth.

The remainder of this paper is structured as follows: Chapter 2 presents the literature review and research gap. Chapter 3 describes the data and econometric model. Chapter 4 reports the results and analysis, and Chapter 5 concludes the study.

2. Literature review

2.1 Theoretical Foundations of Economic Growth and Diversification

The empirical literature on non-oil economic growth in resource-rich countries is grounded in a broad body of economic theory that helps understand the various channels of economic diversification and how policies can strengthen them. For example, Endogenous growth theory has helped to understand the role of internal factors such as knowledge, technology, and human capital in driving long-run growth, emphasizing the positive externalities associated with these factors (Lucas, 1998; Romer, 1986). This is particularly relevant in resource-rich economies because it highlights a mechanism through which growth can go beyond the extractive sectors.

Within the endogenous model, FDI is considered a key channel for enhancing productivity and economic growth by providing technological advancement, learning-by-doing, and the sharing of managerial and production skills. Altogether can strengthen local capabilities and support the development of non-oil sectors, especially when the host economy has sufficient absorptive capacity (Borensztein et al., 1998). As such, FDI plays a vital role in promoting economic diversification and sustaining growth in a resource-dependent economy.

Fiscal policy also has an essential role in endogenous growth theory, specifically in models that include public capital. Infrastructure and other types of government fixed capital are considered productive public expenditure that enhances private-sector productivity and long-run economic growth (Barro, 1990). In contrast, consumption-oriented expenditure may crowd out private investment. This highlights the importance of the government spending component.

The consideration is especially relevant to economies endowed with natural resources. Government revenues from the exports of natural resources can be utilized through productive public investment, to prioritize diversification initiatives, and to create an enabling environment for the development of non-oil sectors.

2.2 Empirical Evidence on Foreign Direct Investment and Economic Growth

Research on the relationship between foreign direct investment and economic growth has yielded mixed results, which may be influenced by factors such as the countries studied, the time period examined, and the methodologies employed. Linkages can be more complex for resource-rich countries, as their economies are typically undergoing a process of structural change. According to Borensztein et al. (1998), FDI affects economic growth positively only if a country's human capital stock is sufficiently high to absorb the technology spillovers associated with FDI. This could be encouraging for Saudi Arabia, which is also focused on improving education and skills, an aspect of the Vision 2030 policy - to attract FDI into non-oil sectors (Vision 2030, 2016).

Evidence gathered in Saudi Arabia may offer more definitive insights into the relative influence of domestic versus foreign investment. For example, Belloumi & Alshehry (2018) examined the influence of domestic and foreign direct investment on non-oil economic growth in Saudi Arabia both were found to harm. This result can be used as evidence that both types of investment should be combined with institutional reforms, policies to boost efficiency, and sectoral diversification to translate them into productive growth.

A recent empirical study has found evidence of a positive and significant impact of FDI on sustainable economic growth in the long run in Saudi Arabia (Elimam & Alattas, 2025), which could be an indication of positive change in the nature of the FDI-growth nexus as improving institutions and reforms make the Kingdom more capable of absorbing FDI productivity in the long run. At the same time, FDI inflows are believed to be a crucial factor in economic growth, as they provide technology, knowledge, capital, and employment opportunities, and have a positive overall effect on a country's economic development (Islam & Beloucif, 2024). Nonetheless, another recent empirical study reveals a positive but insignificant effect of FDI on the economy's growth in that specification (Kayani & Alzaid, 2024). The practical impact of foreign direct investment on stimulating sustainable non-oil growth not only depends on the volume of FDI, but also on policies that attract foreign investors into knowledge-based activities, as well as linkages to domestic companies and institutions, and the absorptive capacity of the economy.

2.3 Financial Development and Private Sector Credit

One of the well-established channels in the finance-growth literature is the role of financial development in economic growth, particularly in expanding private sector credit. Financial development involves a well-functioning financial system that channels capital to its most productive uses, thereby reducing information asymmetries and easing risk diversification, ultimately supporting long-run economic growth (King & Levine, 1993). In this framework, banks' lending to the private sector signifies the effectiveness and development of financial intermediation in channelling savings to productive businesses.

Studies from Saudi Arabia over various periods have also focused on the relationship between economic growth and credit to the private sector, as this is considered a key policy implication for the financial sector's contribution to diversification. In a study that develops this strand of research, Osman (2014) analyzes the impact of private-sector credit on economic growth in Saudi Arabia over the period 1974-2012. The paper uses an ARDL approach and finds long-run relationships between bank financing of the private sector and GDP growth. Lending to the private sector is positively and significantly associated with economic growth, suggesting a valuable contribution to economic and capital market development by the financial intermediation sector. A recent study by Hussin (2024) examined the impact of banks' credit to private and total domestic credit on per capita GDP, employing an ARDL bound testing and error correction model with yearly data from 2000 to 2020. The empirical estimates uncovered positive, statistically significant effects of both variables on GDP in both the short and long term. This confirms the role of credit lending in promoting growth.

Moreover, Latest studies show shifting dynamics as Vision 2030 embeds value in private-sector diversification, with the most recent statistic showing that the private sector accounts for a significant share of GDP, and further growth is expected as Saudi Arabia continues to open up to investment (Burger & Arampatzi, 2025). More research into financial development to support private-sector growth in Saudi Arabia underscores the importance of expanding financial markets and improving access to credit to encourage non-oil economic diversification (Hasanov et al., 2023). Therefore, the theoretical rationale for including private sector credit as an explanatory variable for non-oil GDP growth is that credit availability enables

entrepreneurship, the expansion of existing businesses, and the creation of new manufacturing, service, and technology-based firms, all of which are necessary for economic diversification.

2.4 Government Expenditure and Non-Oil Sector Development

Government spending can play a crucial role in the development of non-oil sectors. In countries with significant non-renewable natural resources, public revenues are often substantial, forming the potential for significant government spending. Government spending can be categorized into two groups: productive and non-productive. Productive government expenditure can positively influence private-sector productivity and long-run economic growth.

Empirical studies in this area have shown different results. For example, Ghali (1997) examined the relationship between per capita GDP and components of government expenditure using a Var model over the period 1960-1996. The analysis revealed no evidence of the impact of consumption or investment on growth. However, following the same method, Hasanov et al. (2022) investigated how fiscal policy affects non-oil growth in Saudi Arabia during 1989-2018, by disaggregating government expenditure into current and capital expenditure. Using various models, the results showed that investment and current expenditure have a statistically significant positive impact on non-oil GDP in the long run; however, investment had a weak contribution, whereas current expenditure had a greater effect. This also suggests that the direction and sign of growth responses to government consumption are associated with its components, efficiency, and direction of private development.

Infrastructure is one of the identified areas where government spending can support growth in the non-oil sectors of the economy and lay the foundation for expansion in manufacturing, services, and technology-based industries. This encompasses the development of transportation, telecommunications networks, electric service infrastructure, and industrial districts, as well as logistics facilities, which are public goods that reduce transaction costs and enhance productivity and competitiveness across all sectors of the economy (Azolibe & Okonkwo, 2020). Constructions have experienced significant expansion in Saudi Arabia. This is particularly the case because Vision 2030 specifically alludes to urbanization and diversification through infrastructure (Yu et al., 2024).

Projects like NEOM, the Diriyah, Jeddah Central, and the new King Salman International Airport are not only being constructed and evolving at a record-breaking pace. However, they are also providing substantial opportunities in tourism, technology, and entertainment (Research & Markets, 2025). Moreover, megaprojects such as the 500 billion NEOM smart city development are fueling substantial demand for construction work and are part of the kingdom's diversification strategy (Shahine et al., 2017).

2.5 Non-Oil Growth Determinants and Interaction Dynamics

Determining the correlation and interaction structures among the various drivers of non-oil economic growth has thus become a key focus of current research on Saudi Arabia's economic diversification. A recent comprehensive analysis, for example, has examined the complex interactions among non-oil economic growth and its key determinants, including financial innovation, non-oil trade openness, non-oil gross capital formation, and human capital (Al-abdi et al., 2023). Such an approach is evidently based on the understanding that no individual growth driver functions in an economic system in isolation, but rather through extensive feedback structures and complementarities with other growth drivers that can reinforce or moderate their contribution to economic growth.

The empirical examination of investment in the context of economic growth has recently also increased. Alshahrani & Al-Sadiq (2014) focused on various types of investments influencing non-oil growth in Saudi Arabia, including private and public investments, as well as disaggregating public investments into multiple components. This can contribute to a better understanding of the relationship between different types of capital formation, including FDI, domestic private, and public investment, and overall non-oil economic performance.

The role of additional variables in non-oil growth is also essential. For instance, Waheed et al. (2020) found that, in addition to gross fixed capital formation, newly emerging sectors such as tourism and renewable energy, and their contribution to economic diversification, also drive long-term growth in non-oil sectors. For example, tourism development will support direct revenues from this industry and have positive spillover effects on the non-oil sector, including related sectors and businesses such as hotels, restaurants, transportation, shopping, and entertainment.

Oil prices influence macroeconomic factors that determine non-oil growth, primarily through fiscal policy, since oil revenue is a major source of government income. This fiscal channel directly impacts public investment and institutions. Oil price movements are reflected in private sector investment, the exchange rate, and other areas, thereby shaping how growth determinants translate into non-oil growth. Majidli and Guliyev (2020) examined how oil prices and exchange rates influence Azerbaijan's non-oil economic growth from 2005 to 2009. Their findings indicate that a 1 percent rise in oil prices leads to a 0.0584 percent increase in non-oil GDP. Similarly, Hussin (2024) controls for oil prices and confirms their significant impact on economic growth, emphasizing their role in empirical growth analyses.

2.6 Research Gap and Conceptual Framework

The role of the oil sector in the economy, along with other drivers, has been widely explored in the literature, drawing on various analytical perspectives and approaches. However, the extent to which these factors influence the growth of non-oil GDP has not been adequately modelled or empirically analyzed. This is particularly true when considering Saudi Arabia, given the rapidly changing institutional and policy context.

Many existing papers are based on bilateral analysis, focusing on the relationship between a single independent variable and overall economic growth, rather than on a multivariate framework that captures the combined effects of foreign direct investment, private-sector lending, government fixed capital formation, and commodity prices.

Although recent studies have explored the interaction between growth drivers (Al-Abdi et al., 2023), FDI versus domestic investment (Belloumi & Alshehry, 2018), or private sector credit (Osman, 2014), Most econometric research was conducted during the initial phase of Vision 2030 and before these reforms established a new economic environment for investors and private companies.

Conceptual framework:

This chapter offers a conceptual framework that explains the economic mechanisms through which key macroeconomic variables influence non-oil GDP in Saudi Arabia. Rather than constructing a formal theoretical model, the framework clarifies the underlying economic relationships that guide the empirical analysis and justify the selection of variables. In this framework, non-oil GDP is treated as the dependent variable. At the same time, government fixed capital, FDI, and private sector credit are the main explanatory variables. Oil prices are included as a control variable, reflecting their role as an external factor that shapes these transmission channels.

GOVFCF refers to government expenditure on infrastructure, buildings, and long-term capital assets. This investment directly enhances economic productivity by improving conditions for business operation and production, thereby fostering growth in non-oil activity.

FDI is stimulated by government investment, as improved infrastructure and public capital lower operational costs and investment risks. This makes Saudi Arabia a more appealing destination for foreign investors seeking higher potential returns.

Private-sector credit enables domestic businesses to leverage public investment by providing the financial resources needed to fund complementary projects that efficiently utilize public infrastructure. Furthermore, increased credit availability may amplify the impact of FDI by enabling domestic firms to collaborate with or benefit from foreign investment.

Oil price fluctuations influence government revenue and banking-sector liquidity, which, in turn, affect government FCF and credit availability, thereby indirectly shaping FDI inflows and non-oil GDP.

These theoretical linkages jointly drive non-oil GDP growth, both directly and indirectly, providing a strong basis for a multivariate approach and motivating the use of the ARDL bounds testing method to identify both long-run equilibrium relationships and short-run adjustment.

3. Data and Methodology

The data set used in this study comprises a time series with annual observations from 1991 to 2023, resulting in a total of 33 observations for empirical analysis of non-oil GDP growth and its potential determinants (Foreign direct investment, private sector credit, government fixed capital formation, and oil price) in the Kingdom of Saudi Arabia. The chosen period covers major turning points in the structure of the Saudi economy, including large swings in oil prices, the global financial crisis (2008-2009), the launch of the Vision 2030 economic reforms, and the COVID-19 pandemic (2020-2022). All variables are extracted from official national and international statistical bodies.

3.1 Data sources and variable definitions

Non-oil GDP (NOGDP) is a dependent variable that measures the real value of economic activity excluding crude oil, natural gas, refined petroleum, and basic petrochemical industries. The study acquired the NOGDP data from the General Authority for Statistics (GASTAT). Foreign direct investment (FDI): the value of FDI, expressed as inflows in current U.S. dollars, was obtained from the UN Trade & Development (UNCTAD). Private sector credit (CREDIT): represents banks' lending to the private sector; data were collected from the Saudi Arabian Monetary Authority (SAMA). Government fixed capital formation (GOVFCF): Data on government fixed capital are from the General Authority for Statistics (GASTAT). Oil Price (OP): Real Brent crude oil prices from the Saudi Arabian Monetary Authority (SAMA) are used as a control variable.

3.2 Data Processing

All nominal series are deflated by using the local constant 2023 prices. The World Bank's GDP deflator is used to deflate domestic variables. The oil price is in real terms, so no deflation was needed. FDI was deflated using the US GDP deflator and converted to the same currency as the other variables (SAR). For the empirical specification, all variables are transformed into natural logs, and dummies for the financial crisis (2008-2009) and COVID-19 (2020-2022) are included to control for potential structural breaks.

Table 1 presents descriptive statistics for the first differences of the logarithmic variables, which are interpreted as annual growth rates. Non-oil growth averages about 5% per year, with relatively low volatility. Oil prices are considerably more volatile, fluctuating between a 56 percent decline and a 53 percent increase, reflecting the inherent instability of commodity markets. Foreign direct investment shows the largest swings, exceeding 300 percent in some years. Government investment and domestic credit growth are more stable, averaging 3% and 7% per year, respectively.

Table 1: Descriptive Statistics

	Observations	Mean	Std. Dev.	Min	Max
Δ ln NOGDP	32	0.050	0.030	-0.024	0.106
Δ ln OP	32	0.035	0.270	-0.563	0.534
Δ ln FDI	32	0.132	1.339	-3.093	2.817
Δ ln GOVFCF	32	0.031	0.205	-0.538	0.412
Δ ln CREDIT	32	0.074	0.113	-0.119	0.333
Notes: shows descriptive statistics of all variables used in the analysis. All variables are measured in log growth rates during the entire sampled period.					

3.3 Econometric Model

This study employs an Autoregressive Distributed Lag (ARDL) bounds testing framework developed by Pesaran et al. (2001). This has been one of the most frequently used econometric approaches for analyzing time-series data in applied studies. Some of the advantages of the ARDL methodology over other cointegration techniques, such as the Johansen approach, are the flexibility of the method, which allows for variables to have a mixture of orders of integration, the applicability of the technique to small sample data, and the estimation of short and long-run parameters within one single equation model (Pesaran et al., 2001).

The general ARDL $(p, q_1, \dots, q_k)$ specification for a dependent variable y_t and K explanatory variables $x_{1t}, x_{2t}, \dots, x_{kt}$, using our variables, can be expressed as

$$lnNOGDP_t = \alpha_0 + \sum_{i=1}^{p} \phi_i lnNOGDP_{t-i} + \sum_{i=0}^{q_1} \beta_{1i} lnFDI_{t-1}$$
$$+ \sum_{i=0}^{q_2} \beta_{2i} lnGOVFCF_{t-1} + \sum_{i=0}^{q_1} \beta_{3i} lnCREDIT_{t-1} + \sum_{i=0}^{q_1} \beta_{4i} lnOP_{t-1} + \varepsilon_t. \quad (1)$$

Where ln is the natural logarithm and ε_t is a serially uncorrelated error term, the parameter ϕ_i captures the autoregressive dynamics of the outcome variable y_t, while (β_{ki}) reflecting the distributed lag effects of the regressors.

If there is persistent cointegration, the model can be reparametrized into an error-correction representation that explicitly distinguishes between short-run adjustments and the long-run equilibrium relationships in the following way:

$$\Delta lnNOGDP_t = \alpha_0 + \lambda ECT_{t-1} + \sum_{i=1}^{p-1} \phi_i \Delta lnNOGDP_{t-i} + \sum_{i=0}^{q_1-1} \beta_{1i} \Delta lnFDI_{t-i}$$
$$+ \sum_{i=0}^{q_2-1} \beta_{2i} \Delta lnGOVFCF_{t-i} + \sum_{i=0}^{q_3-1} \beta_{3i} \Delta lnCREDIT_{t-i}$$
$$+ \sum_{i=0}^{q_4-1} \beta_{4i} \Delta lnOP_{t-i} + \varepsilon_t. \quad (2)$$

Where $ECT_{t-1} = lnNOGDP_{t-1} - \mu - \theta_1 lnFDI_{t-1} - \theta_2 lnGOVFCF_{t-1} - \theta_3 lnCREDIT_{t-1} - \theta_4 lnOP_{t-1}$

The term ECT represents the long-run condition, while λ denotes the error-correction coefficient capturing the speed of adjustment toward equilibrium following a short-run shock. A negative and statistically significant λ result implies convergence to the long-run equilibrium, where the magnitude indicates the rate of convergence. This specification naturally yields both long-run elasticities (θ_j) and short-run impact elasticity (β_{ki}), allowing for the direct interpretation of the persistence and temporal propagation of economic shocks.

The ARDL model has been widely used and confirmed in studies examining growth determinants in developing and emerging countries.

3.4 Limitations

There are a few limitations that might affect the results of this study. First, using annual data from 1991 to 2023 yields only 33 observations, reducing precision and, consequently, the significance of the estimates. Second, as a result, I am required to limit the flexibility of the econometric model to avoid overparameterization. This becomes clear in the model's lag selection, where choosing too many lags makes it impossible to estimate the parameters efficiently, while selecting only a few lags can miss important dynamics that occur gradually rather than contemporaneously.

4. results & analysis

4.1 Unit Root and Bounds Tests

The ARDL bounds-testing approach requires that none of the series be integrated of order two, as the asymptotic critical values derived by Pesaran et al. (2001) are valid only with variables $I(0)$, $I(1)$, or a combination. To verify this condition, I use the Dickey-Fuller (Dickey & Fuller, 1979) and Phillips-Perron (Phillips & Perron, 1988) tests to examine the stationarity of each variable in levels and first differences. Table 2 presents the results for stationarity at both the levels and first differences.

To determine the appropriate lag length for each variable, following Pesaran et al. (2001), I specify the maximum number of lags to three and estimate the conditional model in equation (1) by OLS using various lag lengths for $p=1,2,3$. The lags are selected using the Bayesian Information Criterion to promote parsimony and avoid unnecessary over-parameterization. I find that the optimal lag length includes one lagged variable for log non-oil GDP and three lagged values of log FDI. The other variables, (log) oil price, government capital formation, and credit to the private sector, did not yield any extra information to the model with their lags. Hence, I include only the contemporaneous values of these variables.

Moreover, the bounds testing for cointegration is reported in Table 3. The result shows that the F-statistic is more extreme than the I(1) critical values at different significance levels 10%, 5%, 1%. This implies a firm rejection of the null hypothesis and indicates a long-run relationship among the variables. Hence, we need to specify the empirical specification using error correction as in equation (2) using the established lag structure.

Table 2: Dicky-Fuller and Phillips-Perron Test for stationarity

	Dicky-Fuller				Philips-Perron			
	Levels		First difference		Levels		First difference	
	Test statistic		Test statistic		Test statistic		Test statistic	
lnNOGDP	0.921		-3.12		0.509		-3.092	
lnOP	-1.327		-5.037		-1.178		-5.079	
lnFDI	-2.283		-8.173		-2.158		-8.954	
lnGOVFCF	-0.582		-4.919		-0.764		-4.957	
lnCredit	-1.13		-5.236		-1.24		-5.482	
Financial-crisis dummy	-3.303		-5.385		-3.215		-5.647	
Covid-19 dummy	-2.6		-3.746		-2.635		-3.17	

Notes: shows the Dicky-Fuller and Philips-Perron test for stationarity for each variable- all variables are in logs, except the financial crises and COVID-19 dummies. The null hypothesis is: H_0: the series has a unit root. Critical values are -3.709, -2.983, -2.623, for 1, 5, and 10 percent, respectively (MacKinnon, 1996). All variables are stationary in the first difference.

Table 3: ARDL Bounds Test

Statistic	Value	Significance	I(0)	I(1)
F	23.508	10%	2.747	4.133
K	4	5%	3.407	5.022
		1%	5.081	7.258
H_0: *No relationship*				
$H_{1:}$*Relationship exist*				

4.2 Long and short-run results

The estimated short-run and long-run dynamics from the ARDL-ECM are reported in Table 4. The coefficient on the lagged error correction term, -0.117, is negative and statistically significant at the one percent level, confirming the presence of a stable long-run equilibrium relationship between non-oil GDP and the regressors. The magnitude of this coefficient implies that approximately 12 percent of any disequilibrium in non-oil output is corrected within a year, indicating a moderate speed of adjustment toward the long-run equilibrium.

Among the long-run relationships, oil prices and private sector credit both have positive, statistically significant effects on non-oil GDP. Specifically, a one percent increase in oil prices is associated with a 0.7 percent rise in GDP, in the long run, suggesting that higher oil prices stimulate the broader economy through spillover effects such as increased fiscal expenditure and investment. Similarly, a one percent increase in credit to the private sector leads to an estimated 0.51 percent increase in non-oil GDP. By contrast, the long-run coefficients for foreign direct investment and government GFCF are positive but statistically insignificant, suggesting that these channels do not contribute significantly to long-term non-oil growth during the sampled period.

For the short-term dynamics, the results indicate that changes in FDI affect non-oil output with delayed, temporary effects. The third lag of the difference FDI variable is negative and statistically significant, suggesting that previous inflows of foreign investment may initially disrupt domestic production or reflect time lags before productivity gains emerge.

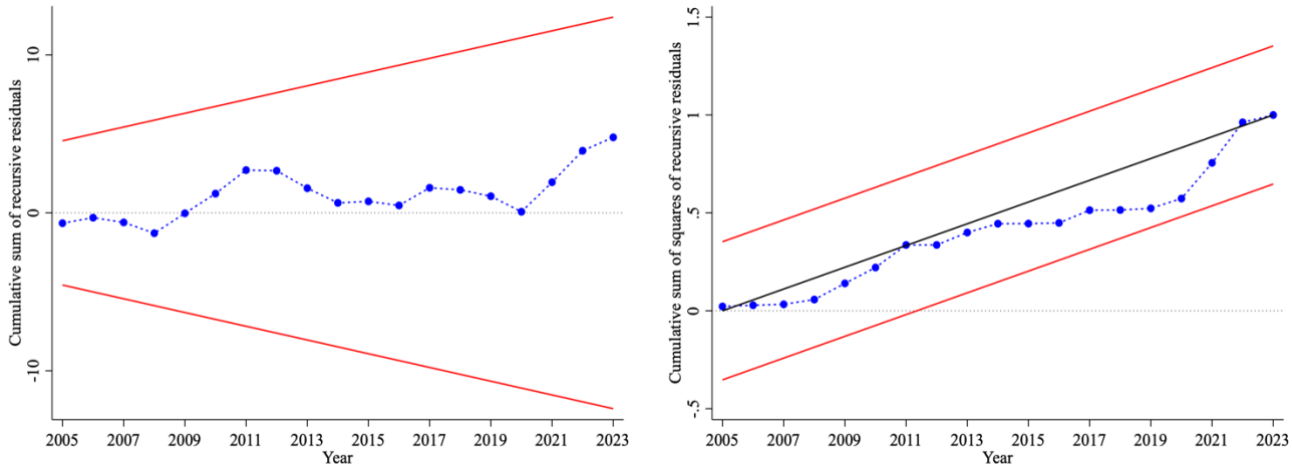
These findings are broadly consistent with earlier evidence from Saudi Arabia. Several studies also report that lending to the private sector is a key driver of long-run economic activity, with positive and significant effects (Osman, 2014). Likewise, the strong long-run influence of oil prices on non-oil output aligns with recent work showing that oil revenue dynamics propagate into non-oil GDP growth (Majidli & Guliyev, 2020). In contrast, our finding that FDI and government fixed capital are insignificant is consistent with that of Kayani & Alzaid (2024) and Ghali (1997).

Table 4: Error correction form of the GDP equation

	Δ log y	
Adjustment		
ln L1. NOGDP	-0.117***	(0.034)
Long-run		
ln OP	0.704***	(0.196)
ln FDI	0.042	(0.044)
ln GOVFCF	-0.095	(0.093)
ln CREDIT	0.510***	(0.122)
Short-run		
Δln FDI	-0.007	(0.005)
Δln L1 FDI	-0.008**	(0.004)
Δln L2 FDI	-0.012***	(0.003)
Observations Adjusted R-squared		30 0.8165

Notes: shows the estimated parameters from the error correction specification outlined in equation (2). The L1, and L2, represent lags at order 1 and 2 respectively, and the Δ represents first difference. Dummy variables for financial crises (significant short-run effect) and COVID-19 dummy (not significant) are left out from the table. *, **, *** represents significance level at the 10, 5, and 1 percent respectively. Standard errors in parentheses. The standard errors are homoscedastic as confirmed by a Breusch-Pagan test (*p=0.848*) and white test (*p=.0414*), and have no autocorrelation at the five percent level as confirmed by Portamanteau test (*p=0.0836).*

Despite the many insignificant coefficients retained in this error-correction specification, the regression fits very well and satisfies the diagnostic tests for no autocorrelation or heteroskedasticity. Recursive estimation over the sample period, as seen in Figure 2. Both the cumulative sum of recursive residual and the cumulative sum of squared recursive residuals are bounded within the 95 percent confidence intervals, and therefore, show no signs of significant breaks.



(a) Cumulative sum of recursive residuals (b) Cumulative sum of squares of recursive residuals

Figure 1: Stability of the coefficients

5. Discussion

Overall, the results show that domestic credit plays a fundamental role in creating growth of non-oil economic activity. Hence, it highlights the importance of a well-functioning financial system that efficiently allocates capital across the entire economy. With this, the continued development of credit markets and improved financing opportunities for firms are essential for continued growth. Second, the non-significant effects of fixed capital formation suggest that government investment does not significantly impact non-oil growth. This might not be surprising, given that the share of non-oil GDP attributable to the government's fixed capital is relatively small. Moreover, the non-significant effects can also indicate inefficiencies in

investment and a low impact on the overall economy. Similarly, the insignificant FDI inflows also point to potential inefficiencies in the allocation of this capital, or that most if most domestic government investments and foreign direct investment are closely related to the oil industry, they might have limited spillover effects on the rest of the economy. Lastly, the strong link between oil prices and non-oil output suggests that the oil market is highly integrated into the Saudi economy and remains a significant contributor to government revenue.

These results indicate that Vision 2030 is a viable option for continued growth. First government investment in industries unrelated to oil will likely boost growth in the non-oil sector. Coupled with improved government interventions, most likely foreign direct investment will increase as there are potential rents for foreign investors. However, the success of these structural changes relies on improvements in capital allocation and human capital development, which help the economy to absorb increased investment more efficiently.

6. Conclusion

This paper examined the determinants of non-oil GDP in Saudi Arabia over the period 1991 to 2023. In particular, I analyzed how the combined effects of foreign direct investment inflows, banks' claims on the private sector, government fixed capital formation, and oil prices impact non-oil GDP. Using an ARDL model with bounds testing and error-correction, I find a stable long-run relationship between non-oil GDP and these macroeconomic variables.

The empirical evidence reveals that both oil prices and private credit have positive and significant long-run effects on non-oil GDP. They suggest that fiscal spillovers from oil revenues and financial intermediation remain pivotal for non-oil performance. In contrast, FDI and public physical investment did not exhibit significant long-term effects, indicating structural issues in investment efficiency, absorptive capacity, and the composition of public investment. The short-run dynamics imply delayed or transitory impacts of FDI on non-oil output, consistent with adjustment costs and time lags in technology diffusion.

These findings carry important policy implications. First, financial sector deepening and the expansion of credit access to productive private enterprises appear crucial to sustaining non-oil growth. Policies that enhance financial inclusion, strengthen regulatory frameworks, and improve capital market development will be essential to ensure that credit expansion translates into higher productivity rather than speculative activity. Second, the insignificance of public investment highlights the need to enhance the public sector's capacity for project appraisal and execution. Reforms aimed at improving efficiency and targeting capital expenditure could generate stronger growth multipliers and crowd in private investment. Third, the weak long-run influence of FDI suggests that the focus on investment policy should shift from quantity to quality, with an emphasis on attracting technology-intensive, high-value-added investments with robust linkages to domestic firms.

Finally, the persistent dependence of non-oil activity on oil price movements points to the ongoing vulnerability of the Saudi economy to external shocks. Strengthening fiscal buffers, expanding non-oil revenue sources, and enforcing countercyclical fiscal rules – the aim of Vision 2030 – will be fundamental to insulating the domestic economy from oil market volatility. The moderate speed of adjustment found in this paper implies that diversification under Vision 2030 is progressing but remains gradual.

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Appendix

Appendix 1

Source	$\mathcal{X}^2$	df	p-value	interpretation
Heteroskedasticity	30	29	0.414	No evidence of heteroskedasticity
Skewness	11.59	10	0.314	Residuals approximately symmetric
Kurtosis	2.16	1	0.1417	No excess kurtosis
Total	43.75	40	0.315	Overall residuals pass normality and homoskedasticity

Appendix 2

Test	$\mathcal{X}^2$ statistic	df	p-value	interpretation
Breusch-Pagan/Cook-Weisberg	0.04	1	0.8477	Fails to reject $H_0 \rightarrow$ homoskedasticity (constant variance)
White's test	30	29	0.414	Fails to reject $H_0 \rightarrow$ homoskedasticity

Appendix 3

Test	statistic	df	p-value	interpretation
Portmanteau (Q) test	6.658	3	0.0836	Fails to reject $H_0 \rightarrow$ residuals are white noise (no autocorrelation).