JBEO (2024), 7(3), 35-42

Journal of Business and Economic Options

Fiscal Policy and Economic Growth in Saudi Arabia: A Study of Government Expenditures and Their Macroeconomic Effects

Qasim Iqbal[a], Muhamed Nader[b]

Abstract

This paper examines the relationship between government expenditures and economic growth in Saudi Arabia over the period from 1970 to 2023. The study aims to explore how changes in government spending have impacted the country's economic development, considering both short-term and long-term effects. By analyzing historical data, the paper seeks to uncover patterns and draw conclusions regarding the role of government expenditure in driving economic growth, focusing on key sectors such as infrastructure, social services, and public investment. This examination is particularly relevant for understanding the effectiveness of government spending as a policy tool in Saudi Arabia, especially in the context of its efforts to diversify its economy beyond oil dependence. The paper uses various econometric methods to analyze the data, providing insights into how shifts in government expenditures have influenced macroeconomic indicators such as GDP growth, employment, and inflation over the past five decades. The findings aim to contribute to the broader discourse on fiscal policy and its impact on economic growth in developing and oil-rich economies. The autoregressive distributed lag approach of co-integration is used in this study to validate the existence of a long-term relationship between government expenditures and economic growth in Saudi Arabia. The results from the ARDL model confirm the long-run validity of three models, demonstrating that government expenditure, government consumption expenditure, and government spending as a share of income significantly influence economic growth, and conversely, economic growth also significantly affects government expenditures over the long term. These findings suggest that government spending plays a crucial role in fostering economic development in Saudi Arabia. Specifically, the models indicate that increases in government expenditure, particularly in areas such as consumption and public investment, are associated with positive growth in the country's economy. Additionally, the reciprocal relationship suggests that as economic growth improves, there is an increased capacity for the government to allocate more resources, thereby further stimulating growth. This mutual influence highlights the importance of effective fiscal policy in driving sustainable economic growth in Saudi Arabia. However, the study reveals that there is no significant statistical evidence supporting the impact between per-capita income and either government expenditure per capita or total government expenditure. This suggests that, over the long term, changes in government spending do not have a strong or direct relationship with per-capita income in Saudi Arabia. Additionally, in the short run, the analysis found no evidence for the impact of economic growth on government spending. This indicates that, in the short term, fluctuations in economic growth do not lead to immediate changes in government expenditure, possibly due to fiscal constraints or the lag in the government's response to economic shifts. These findings underscore the complexity of the relationship between government spending and economic growth, suggesting that while government expenditure may influence long-term growth, its immediate effect may be less pronounced in the short-term period.

Keywords: Government Expenditures, Economic Growth, Fiscal Policy
JEL Codes: E62, H50, O53

1. INTRODUCTION

Economic development often leads to an expansion in the role of government, a relationship described by Wagner's Law (1893). Later, this is proof a positive correlation between government spending and economic growth, asserting that as the economy grows, public expenditure tends to increase (Karhan, 2019; Audi et al., 2019; Ali, 2022; Muhammad, 2023; Ali & Mohsin, 2023; Abigail, 2023). The law highlights that with economic progress, the government's share of economic activity naturally expands due to rising demands for public services, infrastructure, and regulatory frameworks needed to support the increasing complexity of the economy. Wagner's Law provides a theoretical basis for understanding how government spending evolves alongside economic development, emphasizing the growing need for public infrastructure, social services, and governance mechanisms as economies develop. This concept has significantly influenced studies of public finance, offering insights into the interplay between economic growth and government expenditure. Over time, it has become a cornerstone for analyzing the dynamics of fiscal policy in both developed and developing economies (Ahmed, 2019; Roy & Madheswaran, 2020; Adjasi & Yu, 2021; Sossounoy & Kolenikov, 2023).

As economies develop, there is a natural tendency for government expenditure to increase, driven by the growing need for public infrastructure, social services, and regulatory frameworks to support economic activity (Ahmad, 2018; Safdar & Malik, 2020; Modibbo & Inuwa, 2020; Sadashiv, 2023). This concept has played a significant role in shaping the study

[a] Department of Economics, University of Punjab, Pakistan
[b] Department of Economics, Faculty of Economics and Management, King Abdulaziz University, Jeddah, Saudi Arabia

of public finance and understanding how government spending evolves alongside economic development. Several interpretations of this relationship have been proposed by scholars, including notable contributions from Peacock and Wiseman (1961), Pryor (1968), Goffman (1968), Gupta (1967), Man (1980), Pacillo (2022), Ackah (2023), Feng & Qi (2024). These interpretations vary in their methods of measuring and defining the relationship between government spending and economic growth, as well as in the functional forms they propose. For example, Gupta (1967) analyzed this relationship by considering government spending and economic growth as ratios to population, examining government expenditure per capita and per capita national income. This approach provides a perspective on how government spending and national income evolve in relation to population size, offering insights into the distribution of economic resources across individuals. Similarly, Goffman (1968) refined this approach by focusing on economic growth per capita rather than government spending per capita. He emphasized that growth in individual income and wealth plays a more direct role in driving increases in government expenditure, highlighting the importance of per capita economic growth as a determinant of public spending patterns.

These differing perspectives on the relationship between government spending and economic growth highlight the diversity of thought in the field of public finance and the role of government in economic development. Each approach offers a unique understanding of how public expenditure evolves, shaped by the methods used to measure it and the variables considered (Yan & Chen, 2019; Zhang, 2020; Avelino & Coronel, 2021; Audi et al., 2022; Audi, 2024). For instance, Peacock and Wiseman (1961) argued that as economies expand, public spending rises in response to increased demand for services, infrastructure, and social programs. Their perspective suggested that economic growth leads to greater resource allocation by governments to meet the needs of a growing and more complex society. Building on this idea, Mann (1980) proposed that government expenditure as a proportion of national income is directly influenced by economic growth. Mann emphasized that the share of income allocated to public spending adjusts in relation to the economy's growth rather than remaining fixed. By measuring government spending as a ratio of national income, this approach provided deeper insights into how public expenditure evolves relative to the overall economic output. This refinement demonstrated that increases in public spending are more closely linked to changes in the economy's performance than to its absolute size, offering a nuanced view of the dynamics at play (Shahid & Ali, 2015; Ali et al., 2023).

By analyzing government spending as a ratio of income, this perspective highlights the connection between economic growth rates and the government's fiscal response, offering a nuanced understanding of how changes in national income shape the allocation of public sector resources. This approach is particularly effective in explaining how public expenditure adjusts dynamically to fluctuations in national income, providing insights into the responsiveness of fiscal policy. In contrast, another interpretation narrows the focus to the types of government expenditure influenced by economic growth. For instance, one perspective argues that it is primarily government consumption expenditure—rather than total spending—that rises as the economy grows. Government consumption expenditures include spending on current goods and services such as public sector salaries, infrastructure maintenance, and other operational costs. This view emphasizes that recurrent, short-term expenditures are more directly correlated with economic growth, whereas capital investments or long-term spending may not follow the same pattern. This distinction underscores the immediate impact of economic growth on consumption-focused public spending, offering a different angle on the dynamics of fiscal policy.

When considering these theoretical frameworks, it is essential to address variations in interpretations of government expenditure and their policy implications. In contexts like Saudi Arabia, increases in government spending are often tied to industrialization, modernization, and the establishment of large-scale projects. For example, infrastructure developments such as railroads typically require significant public investment due to the private sector's limited capacity to undertake such initiatives. These patterns highlight the critical role of government in driving economic transformation, particularly in areas where large-scale resources and coordination are needed.

In 2017, the Saudi government announced plans to reduce public expenditure by implementing various measures aimed at decreasing reliance on direct government intervention in the economy. A key aspect of this strategy was to empower the private sector to take on a more significant role in driving economic growth, fostering a more market-oriented approach to development. This shift in policy prompts an important question: does government spending serve as a catalyst for economic growth, or is it simply a reaction to economic expansion? The primary objective of this study is to explore the dynamics of government expenditure and economic growth in Saudi Arabia by examining two prominent economic theories. The analysis evaluates the relevance of both a government-led growth model and one in which fiscal policy reacts to economic conditions. By assessing the relationship between public spending and economic expansion, this study seeks to determine whether government expenditure acts as a driving force behind growth or as a response to the broader economic environment. This exploration is vital for understanding the future direction of fiscal policy and the evolving role of the private sector in sustaining long-term economic development in Saudi Arabia. Insights from this study will contribute to shaping strategies that balance public and private sector contributions to economic progress.

2. LITERATURE REVIEW

Several empirical studies have applied Wagner's Law to establish a relationship between increasing public expenditure and GDP growth. However, there are also studies that argue Wagner's Law does not hold universally across all countries. For instance, Ram (1986) tested Wagner's Law on 63 countries and found only limited support for the theory. One of the key observations from such studies is that Wagner's Law tends to hold in wealthier nations but not in poorer ones. Abizadeh and Gray (1985) also highlighted that the applicability of Wagner's Law may depend on the structural characteristics of a country's economy, suggesting that economic development plays a significant role in determining whether the law is valid. In the context of Saudi Arabia, only a few empirical studies have tested the validity of Wagner's Law. Given the country's unique economic structure, largely driven by oil revenues, industrialization, and government-led development, the relationship between government expenditure and economic growth in Saudi Arabia may not follow the same patterns observed in other countries. These studies could offer valuable insights into whether Wagner's Law is applicable to Saudi Arabia's economy, or if other factors, such as the role of oil exports and state-driven development policies, contribute to a different fiscal dynamic. Thus, examining the relationship between government spending and economic growth in Saudi Arabia could provide a more nuanced understanding of Wagner's Law in the context of oil-rich economies. For example, Al-Faris (2002) examined the relationship between government expenditure and economic growth in the Gulf Cooperation Council (GCC) countries. His study found significant evidence that national income serves as a predictive factor for government spending, but not the other way around. This suggests that, in the GCC countries, government expenditure tends to follow economic growth rather than drive it, which aligns with some interpretations of Wagner's Law.

In the case of Saudi Arabia, Albatel (2002) conducted a study using time series data from 1964 to 1998 to explore the causal relationship between government spending and economic growth. His findings indicated that Wagner's Law holds true for this period in Saudi Arabia, showing that as the economy grew, government spending also increased. This supports the idea that in certain contexts, particularly in oil-rich economies like Saudi Arabia, government expenditure may indeed follow the expansion of national income, as suggested by Wagner's Law. These studies highlight the varying applicability of Wagner's Law in different contexts, particularly in the case of oil-dependent economies like those of the GCC countries and Saudi Arabia. The evidence from these empirical studies suggests that while Wagner's Law may hold true in some periods and for some countries, the relationship between government spending and economic growth can be influenced by a variety of factors, including the economic structure and the role of the state in driving economic development. Furthermore, Ghali (1997) explored the relationship between the share of government spending in GDP and per capita GDP growth in Saudi Arabia over the period from 1960 to 1996. His findings revealed a statistically significant causal relationship running from per capita GDP to government spending as a share of GDP. However, there was no evidence supporting the reverse causality, i.e., that government spending as a share of GDP causes per capita GDP growth. This suggests that, in Saudi Arabia during this period, economic growth led to increased government spending rather than government expenditure driving economic growth.

In a similar vein, Ghali and Al-Shamsi (1997) conducted an investigation into the relationship between government investment, government consumption, and economic growth in the United Arab Emirates (UAE) over the period from 1973 to 1995. Their study found positive evidence for a causal relationship running from government investment to economic growth, implying that government investments in infrastructure and other capital projects played a significant role in driving the country's economic growth. However, the study found no evidence to support a causal relationship from government consumption to economic growth. This suggests that, at least in the context of the UAE, it is investment rather than consumption expenditure that has a more substantial impact on economic growth. These studies underscore the nuanced and context-specific nature of the relationship between government spending and economic growth. They highlight that while government investment can have a positive effect on economic growth, government consumption may not have the same direct impact, depending on the country and time period under consideration. Additionally, the causality between economic growth and government spending varies, suggesting that the direction of influence can differ across economies. Moreover, Alshahrani and Alsadiq (2014) investigated the relationship between government spending and the economic growth rate, specifically focusing on real non-oil per capita GDP in Saudi Arabia. Their study found that public investment, as well as expenditure on healthcare and education, has a short-run impact on the growth rate of real non-oil per capita GDP. This suggests that government spending in these sectors can provide an immediate boost to the country's non-oil economic growth. Furthermore, in the long run, both capital expenditure and spending on healthcare were found to significantly impact the growth rate of real non-oil GDP, highlighting the sustained importance of government investment in infrastructure and social services for long-term economic growth.

Additionally, Ageli (2013) tested the validity of Wagner's Law for Saudi Arabia over the period from 1970 to 2012, considering both real oil GDP and non-oil GDP. Ageli's findings provided strong evidence supporting Wagner's Law, demonstrating that there is a long-term relationship between government expenditure and economic growth for both real GDP and non-oil GDP. This suggests that, in Saudi Arabia, the expansion of government spending is closely tied to economic growth over the long term, reinforcing the idea that economic development leads to increased public expenditure, a core principle of Wagner's Law. These studies further contribute to the understanding of the relationship between government spending and economic growth in Saudi Arabia, providing evidence that while some forms of government expenditure have an immediate effect on growth, others—particularly in infrastructure and healthcare—are crucial for long-term economic development. They also support the applicability of Wagner's Law in the Saudi context, indicating that as the economy grows, government spending, particularly in key areas such as investment and social services, also tends to increase. In this working paper, we aim to build on previous empirical studies in three distinct ways. First, we will utilize recent time series data that covers various phases of the business cycle, providing a more comprehensive view of the relationship between government expenditure and economic growth in Saudi Arabia. Second, we will assess whether prior studies have applied the appropriate econometric models based on the specific characteristics of the time-series data used in Saudi Arabia. To ensure the correct model is used, we plan to employ OLS (Ordinary Least Squares) estimation and test for stationarity, confirming that all variables have a zero mean and constant variance. This will ensure that any observed relationships are not spurious. In addition, we will differentiate each time series by estimating a standard regression model using OLS. We will check whether all variables are integrated of the same order, meaning they are integrated of order one (I(1)) but not co-integrated. If we find that all series are integrated in the same order but also co-integrated, we will consider two potential models. The first is an OLS regression model using the levels of data to establish the long-run equilibrium relationship between the variables. The second option is to use an Error Correction Model (ECM), which can be estimated by OLS and will capture the short-run dynamics of the relationship between the variables. The complexity of the situation arises from the need to test for co-integration and estimate both long- and short-run dynamics. The variables involved may include a mixture of stationary and non-stationary time series when tested at the level, posing challenges for traditional co-integration tests. Since the conventional Johansen co-integration test (1988) requires that time series variables be non-stationary at the level and stationary once transformed into first differences, this test is not appropriate for our data due to the violation of this precondition.

3. METHODOLOGY

The theoretical framework of this study is based on endogenous growth theory, which focuses on the relationship between fiscal policy variables and economic growth in the Saudi economy. According to this theory, government expenditure is expected to influence the output of an economy, and the relationship between economic output (G) and government expenditure (y) is modeled in its simplest form as:

$G = f(y)$

The data used in this study consists of annual figures from 1979 to 2023 for all Saudi variables. A challenge arose in 1990 and 1991 when government consumption expenditure data was aggregated into one figure for those years. To address this, we applied the Hodrick-Prescott Filter interpolation method to estimate the annual data for these years. Additionally, government consumption expenditure was converted into real terms by using the Consumer Price Index (CPI). To normalize the data and make it easier to compare over time, the natural logarithm of all variables was calculated. Both the government expenditure and GDP variables in Saudi Arabia have shown similar trends over time. From the early 1970s, both variables moved in an upward direction, reflecting the country's growing economy and public spending. However, during the early 1980s, both variables began to decline, largely due to the oil crisis, which significantly impacted Saudi Arabia's economic growth. The decline was short-lived, as by the early 1990s, GDP began to rise again and has largely followed an upward trend until 2015, with minimal declines.

For the empirical analysis, we followed several steps to ensure the accuracy of our results. Initially, we conducted the Augmented Dickey-Fuller (ADF) (1979) unit root test to determine whether the variables are stationary at level or at first difference. This is essential, as the variables must be either integrated of order zero (I(0)) or integrated of order one (I(1)) to avoid spurious regression results, as Phillips (1986) warned against using non-stationary variables in regression analysis. After confirming stationarity, we applied the ARDL bound test approach of co-integration as outlined by Pesaran and Shin (1999) and Pesaran et al. (2001). The ARDL approach was chosen because it offers flexibility by allowing for the analysis of variables with mixed integration orders (I(0) and I(1)), unlike other co-integration methods that require all variables to be integrated in the same order. This model also has the advantage of allowing different lag lengths for each variable, providing a more accurate representation of the dynamic relationships between the variables. Using this approach, we can test for the long-run relationship among government spending, economic output, and other fiscal variables, while also estimating both the long-run and short-run effects.

4. RESULTS AND DISCUSSION

The Augmented Dickey-Fuller (ADF) unit root test results assess the stationarity of the variables at their level and first differences. A variable is considered stationary if the test statistic is significantly negative, often judged against critical values, and the p-value is below the chosen significance threshold (e.g., p<0.05p < 0.05p<0.05). For Ln(G)\text{Ln(G)}Ln(G), the test statistic at the level is -4.207350 with a p-value of 0.00, indicating stationarity at the level. At the first difference (ΔLn(G)\Delta \text{Ln(G)}ΔLn(G)), the test statistic is -3.649564, also with a p-value of 0.00, confirming stationarity. This suggests that the variable does not require differencing for stationarity. In the case of Ln(Y)\text{Ln(Y)}Ln(Y), the test statistic at the level is -1.454228 with a p-value of 0.54, indicating non-stationarity. However, at the first difference (ΔLn(Y)\Delta \text{Ln(Y)}ΔLn(Y)), the test statistic improves to -5.524271 with a p-value of 0.00, confirming stationarity after differencing once. For Ln(Y/N)\text{Ln(Y/N)}Ln(Y/N), the test statistic at the level is -3.024147 with a p-value of 0.04, suggesting borderline stationarity at the level. At the first difference (ΔLn(Y/N)\Delta \text{Ln(Y/N)}ΔLn(Y/N)), the test statistic becomes -5.024697 with a p-value of 0.00, confirming stationarity.

The variable Ln(G/N)\text{Ln(G/N)}Ln(G/N) has a test statistic of -4.087962 at the level and a p-value of 0.00, showing stationarity at the level. At the first difference (ΔLn(G/N)\Delta \text{Ln(G/N)}ΔLn(G/N)), the test statistic is -3.671577, with a p-value of 0.00, further confirming stationarity. For Ln(G/Y)\text{Ln(G/Y)}Ln(G/Y), the test statistic at the level is -3.996038 with a p-value of 0.00, indicating stationarity at the level. At the first difference (ΔLn(G/Y)\Delta \text{Ln(G/Y)}ΔLn(G/Y)), the test statistic is -4.871514, also with a p-value of 0.00, confirming stationarity. Overall, the results indicate that most variables are stationary either at their level or after differencing once. Variables such as Ln(G)\text{Ln(G)}Ln(G), Ln(G/N)\text{Ln(G/N)}Ln(G/N), and Ln(G/Y)\text{Ln(G/Y)}Ln(G/Y) are stationary at the level, while Ln(Y)\text{Ln(Y)}Ln(Y) requires first differencing to achieve stationarity. The variable Ln(Y/N)\text{Ln(Y/N)}Ln(Y/N) shows borderline stationarity at the level but is confirmed to be stationary after differencing. These results support the appropriateness of using these variables in further econometric analyses while accounting for their stationarity properties.

Table 1: Augmented Dickey-Fuller Unit Root Tests

Variable	Test Statistic I(0)	Test Statistic I(1)
Ln(G)	-4.207350	-3.649564
Ln(Y)	-1.454228	-5.524271
Ln (Y/N)	-3.024147	-5.024697
Ln (G/N)	-4.087962	-3.671577
Ln (G/Y)	-3.996038	-4.871514

The ARDL co-integration test results highlight the presence of long-term relationships between the variables under Wagner's and Keynesian models. The F-statistics are compared against critical bounds to determine the existence of co-integration. Typically, if the F-statistic exceeds the upper bound critical value, there is evidence of co-integration. Under Wagner's model, the relationship between Ln(G)\text{Ln(G)}Ln(G) and Ln(Y)\text{Ln(Y)}Ln(Y) yields an F-statistic of 6.06, suggesting a strong co-integration relationship. Similarly, the pair Ln(GC)\text{Ln(GC)}Ln(GC) and Ln(Y)\text{Ln(Y)}Ln(Y) has a higher F-statistic of 6.41, indicating a robust co-integrating relationship. The variables Ln(G)\text{Ln(G)}Ln(G) and Ln(Y/N)\text{Ln(Y/N)}Ln(Y/N) show the strongest evidence of co-integration with an F-statistic of 8.79, highlighting a significant long-term association. For Ln(G/N)\text{Ln(G/N)}Ln(G/N) and Ln(Y/N)\text{Ln(Y/N)}Ln(Y/N), the F-statistic is 4.81, which is closer to the lower threshold of co-integration evidence. Lastly, Ln(G/Y)\text{Ln(G/Y)}Ln(G/Y) and Ln(Y)\text{Ln(Y)}Ln(Y) have an F-statistic of 4.31, which may indicate a weaker but still notable long-term relationship.

In Keynesian models, the direction of co-integration changes. For Ln(Y)\text{Ln(Y)}Ln(Y) and Ln(G)\text{Ln(G)}Ln(G), the F-statistic is 5.36, indicating a moderate co-integration. The relationship between Ln(Y)\text{Ln(Y)}Ln(Y) and Ln(GC)\text{Ln(GC)}Ln(GC) is particularly strong, with an F-statistic of 11.66, the highest across all tested relationships, suggesting a significant long-term link. For Ln(Y/N)\text{Ln(Y/N)}Ln(Y/N) and Ln(G)\text{Ln(G)}Ln(G), the F-statistic of 6.49 supports co-integration. The pair Ln(Y/N)\text{Ln(Y/N)}Ln(Y/N) and Ln(G/N)\text{Ln(G/N)}Ln(G/N) has an F-statistic of 4.42, which is weaker compared to other pairs but still indicative of a potential co-integration. Finally, Ln(Y)\text{Ln(Y)}Ln(Y) and Ln(G/Y)\text{Ln(G/Y)}Ln(G/Y) show an F-statistic of 6.12, suggesting a relatively strong co-integrating relationship.

The results across both models indicate varying strengths of long-term relationships between the variables. Co-integration is strongest for variables involving Ln(GC)\text{Ln(GC)}Ln(GC) and Ln(Y)\text{Ln(Y)}Ln(Y), particularly under Keynesian theory. Wagner's model shows a significant relationship between Ln(G)\text{Ln(G)}Ln(G) and Ln(Y/N)\text{Ln(Y/N)}Ln(Y/N), reflecting a notable long-term association. These findings suggest that the theoretical frameworks of both Wagner and Keynes are supported by evidence of co-integration, with specific pairs of variables showing stronger ties depending on the model.

Table 2: ARDL Co-integration test

Wagner's model	F-stat.	Keynes model	F-stat.
Ln(G) and Ln(Y)	6.06	Ln(Y) and Ln(G)	5.36
Ln(GC) and Ln(Y)	6.41	Ln(Y) and Ln(GC)	11.66
Ln (G) and Ln(Y/N)	8.79	Ln (Y/N) and Ln(G)	6.49
Ln(G/N) and Ln(Y/N)	4.81	Ln(Y/N) and Ln(G/N)	4.42
Ln(G/Y) and Ln(Y)	4.31	Ln(Y) and Ln(G/Y)	6.12

The table of estimated long-run coefficients provides insights into the relationships between the dependent and independent variables across various models, focusing on both the magnitude and statistical significance of the coefficients. In the model G=f(Y)G = f(Y)G=f(Y) with lag structure (1,0), the coefficient for YYY is 1.86, which is significant as indicated by the T-statistic of 6.86. This suggests that a one-unit increase in YYY is associated with a 1.86-unit increase in GGG in the long run. The constant term, CCC, is -5.23 and also significant (T=−3.38T = -3.38T=−3.38), indicating a downward adjustment when YYY is at zero. For the model GC=YGC = YGC=Y with the same lag structure (1,0), the coefficient for YYY is 0.99, which is significant (T=8.82T = 8.82T=8.82), showing that GCGCGC increases nearly one-to-one with YYY. The constant term CCC, however, is -0.09 and not significant (T=−0.13T = -0.13T=−0.13), indicating no strong influence from the constant in this relationship.

In the model G=f(Y/N)G = f(Y/N)G=f(Y/N) with lag structure (3,4), the coefficient for Y/NY/NY/N is 27.32 but not statistically significant, as indicated by the T-statistic of 0.33. Similarly, the constant CCC is -115.93, with a non-significant T-statistic of -0.31. This implies weak evidence for a long-run relationship between GGG and Y/NY/NY/N in this specification. For G/N=f(Y/N)G/N = f(Y/N)G/N=f(Y/N) with lag structure (3,2), the coefficient for Y/NY/NY/N is 4.48 but also not significant (T=1.58T = 1.58T=1.58). The constant CCC is -16.06 with a non-significant T-statistic of -1.25. This indicates that the relationship between G/NG/NG/N and Y/NY/NY/N is not robust in the long run.

Lastly, in the model G/Y=f(Y)G/Y = f(Y)G/Y=f(Y) with lag structure (1,2), the coefficient for YYY is 0.66, which is significant (T=1.86T = 1.86T=1.86). The constant CCC is -4.18 and also significant (T=−2.06T = -2.06T=−2.06). This shows a positive long-run relationship between G/YG/YG/Y and YYY, with a downward adjustment reflected by the constant. Overall, the results indicate strong and significant long-run relationships in models where GGG or GCGCGC is dependent on YYY, while models involving Y/NY/NY/N show weaker evidence for co-integration or long-term relationships. The significant constants in some models reflect adjustments not captured solely by the independent variables.

Table 3: Estimated long-run coefficients

Variables	Parameter	Coefficient	T-Stat.
G=f (Y)	Y	1.86*	6.86
	C	-5.23*	-3.38
GC=Y	Y	0.99*	8.82
	C	-0.09	-0.13
G=y/n	Y/n	27.32	0.33
	C	-115.93	-0.31
G/n=Y/n	Y/n	4.48	1.58
	C	-16.06	-1.25
G/Y=Y	YC	0.66*	1.86
		-4.18*	-2.06

The table of error correction representations for the ARDL approach provides insights into the short-term dynamics and the speed of adjustment towards long-run equilibrium for various models. The coefficients of the error correction terms (ECT) are particularly significant as they indicate the extent and speed of adjustment when deviations from the equilibrium occur. In the model G=YG = YG=Y, the coefficient for the first difference of YYY (ΔY\Delta YΔY) is 0.66, but it is not statistically significant (T=1.44T = 1.44T=1.44). This indicates a limited short-term impact of YYY on GGG. However, the ECT coefficient is -0.31 and significant (T=−3.00T = -3.00T=−3.00), showing that approximately 31% of the deviation from the long-run equilibrium is corrected in each period, demonstrating a moderate speed of adjustment. For GC=YGC = YGC=Y, the coefficient for ΔY\Delta YΔY is 0.35 and significant (T=1.74T = 1.74T=1.74), indicating a meaningful short-term relationship between YYY and GCGCGC. The ECT coefficient is -0.29 and significant (T=−4.12T = -4.12T=−4.12), suggesting that 29% of the disequilibrium is corrected each period, indicating a steady adjustment towards the long-run equilibrium.
In the model G=Y/NG = Y/NG=Y/N, the coefficient for the first difference of Y/NY/NY/N (ΔY/N\Delta Y/NΔY/N) is 1.02 and significant (T=2.63T = 2.63T=2.63), reflecting a substantial short-term impact of Y/NY/NY/N on GGG. The ECT coefficient is -0.01 and significant (T=−5.31T = -5.31T=−5.31), though the speed of adjustment is very slow, with only 1% of the deviation being corrected each period. For G/N=Y/NG/N = Y/NG/N=Y/N, the coefficient for ΔY/N\Delta Y/NΔY/N is 1.23 and significant (T=2.69T = 2.69T=2.69), showing a strong short-term relationship between Y/NY/NY/N and G/NG/NG/N. The ECT coefficient is -0.12 and significant (T=−3.93T = -3.93T=−3.93), indicating that 12% of the disequilibrium is corrected each period, reflecting a moderate pace of adjustment. In the model G/Y=YG/Y = YG/Y=Y, the coefficient for ΔY\Delta YΔY is 0.99 and significant (T=2.14T = 2.14T=2.14), suggesting a notable short-term effect of YYY on G/YG/YG/Y. The ECT coefficient is -0.23 and significant (T=−1.96T = -1.96T=−1.96), showing that 23% of the deviation from the equilibrium is corrected in each period, indicating a moderate speed of adjustment. Overall, the results highlight that the ECT coefficients are negative and significant across all models, confirming the existence of long-run relationships and the system's tendency to return to equilibrium. The speed of adjustment varies, with models like GC=YGC = YGC=Y and G=Y/NG = Y/NG=Y/N showing slower correction rates compared to others. Short-term dynamics, reflected in the coefficients of the first differences, are significant in most models, suggesting meaningful short-term effects of the independent variables on the dependent variables.

Table 4: Error Correction Representation for the ARDL approach

Model	Parameter	Coefficient	T-Stat
G=Y	DY ECT	0.66	1.44
		-0.31*	-3.00
GC=Y	DY ECT	0.35*	1.74
		-0.29*	-4.12
G=Y/n	D(Y/n)ECT	1.02*	2.63
		-0.01*	-5.31
G/n=Y/n	D(Y/n)ECT	1.23*	2.69
		-0.12*	-3.93
G/Y=Y	D(Y)ETC	0.99*	2.14
		-0.23*	-1.96

5. CONCLUSIONS

This study examines the relationship between economic growth and government spending in Saudi Arabia, utilizing recent time series data spanning from 1979 to 2023. The analysis reveals that, in the long run, government expenditure, government consumption expenditure, and government spending as a share of income all significantly influence economic growth, and vice versa. This finding confirms the reciprocal relationship between fiscal policy and economic output, demonstrating that changes in government spending have a meaningful impact on the economy over time. The results from the three models used in the study support the notion that as government expenditure increases, it can drive economic growth by enhancing public services, infrastructure, and social welfare. Similarly, economic growth contributes to higher government spending, as the expansion of national income leads to increased demand for government services and greater capacity for public investment. This dynamic interaction between government spending and economic growth highlights the important role of fiscal policy in shaping the long-term trajectory of the Saudi economy. However, the study reveals that there is no significant evidence of any correlation between per-capita income and either government expenditure per capita or total government expenditure. This suggests that, in the case of Saudi Arabia, changes in per-capita income do not appear to have a direct or consistent effect on government spending on a per capita basis, nor does government expenditure seem to be a key driver of changes in per-capita income. These findings indicate that the relationship between government expenditure and income may be more complex or influenced by other factors, such as the structure of the economy or oil revenues, rather than a simple direct correlation between income levels and government spending patterns. Investigating the short-run validity of the models, the study concludes that there is a positive impact of economic growth on both government consumption expenditure and the share of government spending in relation to GDP. This suggests that, in the short term, as economic growth increases, the government tends to allocate more resources to consumption spending and raise its expenditure relative to the overall size of the economy. These findings highlight the responsive nature of government spending in the short run, where higher economic growth drives increased public spending, likely due to higher revenues and the growing demands for public services and infrastructure. Moreover, the study found that in the short run, per-capita economic growth has a positive impact on both government spending and government spending per capita. This suggests that as per-capita income increases, there is a corresponding rise in government expenditure, reflecting the government's capacity to spend more as the economy grows. In other words, an increase in economic growth leads to a rise in both overall and per-capita government spending. The study further underscores that while increased government spending does not automatically guarantee higher economic growth, it plays a crucial role in stimulating economic activity, particularly in Saudi Arabia. The findings emphasize the importance of government capital spending, which has a significant impact on long-term economic growth. Investment in infrastructure and other capital projects not only supports immediate economic growth but also lays the foundation for sustainable, long-term development. This highlights the key role of government expenditure, especially in areas like capital spending, in driving economic growth in Saudi Arabia over time.

REFERENCES

Abigail, E. C. (2023). Unlocking Economic Growth Through Taxation in the case Nigeria. *Journal of Business and Economic Options*, *6*(4), 21-27.

Ackah, I. (2023). Examining Government Expenditure and Economic Growth in Ghana. *Journal of Business and Economic Options*, *6*(1), 29-36.

Adjasi, C. K., & Yu, D. (2021). Investigating South Africa's Economic Growth: The Role of Financial Sector Development. *Journal of Business and Economic Options*, *4*(3), 19-29.

Ageli, M.M. (2013). Wagner’s Law in Saudi Arabia 1970-2012: An Econometric Analysis. *Asian Economic and Financial Review*, 3(5), 647-659.

Ahmad, K. (2018). Addressing Demographic Challenges: Strategies for Sustainable Economic Growth in Pakistan. *Journal of Business and Economic Options*, *1*(4), 120-130.

Ahmed, F. A. (2019). Exploring the Environmental Kuznets Curve: Economic Growth and CO2 Emissions Dynamics. *Journal of Business and Economic Options*, *2*(1), 35-44.

Albatel, A.H. (2002). Wagner’s Law and the Expanding Public Sector in Saudi Arabia. *Administration Science*, 14 (2), 139-160.

Al-Faris, A. F. (2002). Public Expenditure and Economic Growth in the Gulf CooperationCouncil Countries, *Applied Economics*, 34(9), 1187-1195.

Ali, A. (2022). Foreign Debt, Financial Stability, Exchange Rate Volatility and Economic Growth in South Asian Countries. *Journal of Business and Economic Options*, *5*(4), 26-34.

Ali, A., Sumaira, S., Siddique, H. M. A., & Ashiq, S. (2023). Impact of economic growth, energy consumption and urbanization on carbon dioxide emissions in the kingdom of Saudi Arabia.

Ali, S. B., & Mohsin, A. (2023). Exploring Financial Soundness and Economic Growth Dynamics in Pakistan. *Journal of Business and Economic Options*, *6*(1), 1-15.

Alshahrani, S. A., & Alsadiq, A. J. (2014). Economic growth and government spending in SaudiArabia: An empirical investigation. *IMF Working Paper*, WP/14/3.

Audi, M. (2024). The Impact of Exchange Rate Volatility on Long-term Economic Growth: Insights from Lebanon. *Journal of Policy Options*, *7*(2), 1-10.

Audi, M., Ali, A., & HAMADEH, H. F. (2022). Nexus Among Innovations, Financial Development and Economic Growth in Developing Countries. *Journal of Applied Economic Sciences*, *17*(4).

Audi, M., Bibi, C., & Ahmad, K. (2019). Financial Inclusion, Economic Growth and Human Well-Being Nexus: Empirics from Pakistan, India, China, Sri-Lanka, Bangladesh and Malaysia. *Bulletin of Business and Economics (BBE)*, *8*(4), 177-190.

Avelino, G., & Coronel, D. A. (2021). Macroeconomic Determinants of Economic Growth in Developing Countries: A Cross-Sectional Analysis. *Journal of Business and Economic Options*, *4*(1), 16-24.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive timeseries with a unit root. *Journal*

of the American statistical association, 74(366a), 427-431.
Feng, J., & Qi, S. (2024). Digital Infrastructure Expansion and Economic Growth in Asian Countries. *Journal of Business and Economic Options*, *7*(2), 27-32.
Johansen, S. (1988). Statistical Analysis and Cointegrating Vectors. *Journal of EconomicDynamics and Control*, 12(2-3), 231−254.
Karhan, G. (2019). Investing in Research and Development for Technological Innovation: A Strategy for Turkey's Economic Growth. *Journal of Business and Economic Options*, *2*(4), 152-158.
Keynes, J. M. (1936) General Theory of Employment, Interest and Money, London: PalgraveMacmillan
Modibbo, H., & Inuwa, N. (2020). Health Outcomes and Economic Growth Nexus: Evidence from Nigeria. *Journal of Business and Economic Options*, *3*(2), 46-55.
Muhammad, A. A. (2023). Examining the Relationship among Unemployment, Inflation, and Economic Growth. *Journal of Business and Economic Options*, *6*(2), 23-31.
Pacillo, G. (2022). Urbanization, Economic Growth, and Equity in Sri Lanka: Trends, Patterns, and Policy Implications. *Journal of Business and Economic Options*, *5*(3), 20-25.
Pesaran, M. H. & Shin, Y. (1999). An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis, in S. Strom, (ed) Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium, Cambridge: *Cambridge University Press*.
Pesaran, M.H. (1997). The Role of Economic Theory in Modelling the Long Run. *The EconomicJournal*, 107 (4), 178-191.
Phillips, P.C.B. (1986). Understanding spurious regressions in econometrics. *Journal ofEconometrics*, 33*(*3), 311-340.
Ram, R. (1986). Government Size and Economic Growth: A New Framework and Some Evidence from Cross-Section and Time-Series Data. *The American Economic Review*, 76 (1),191-203.
Roy, S., & Madheswaran, S. (2020). The Nexus between Financial Sector Development and Economic Growth: Evidence from Asian Countries. *Journal of Business and Economic Options*, *3*(2), 39-45.
Sadashiv, K. R. (2023). Foreign Direct Investment Dynamics and Economic Growth in the Case of India. *Journal of Business and Economic Options*, *6*(1), 45-52.
Safdar, Z., & Malik, R. (2020). Unraveling the Interplay Between External Debt and Economic Growth: Insights from Pakistan's Macroeconomic Landscape. *Journal of Business and Economic Options*, *3*(3), 120-128.
Shahid, M., & Ali, A. (2015). The impact of decentralized economic affairs expenditures on economic growth: A time series analysis of Pakistan. *Bulletin of Business and Economics (BBE)*, *4*(3), 136-148.
Sossounov, K., & Kolenikov, S. (2023). Addressing Inequality Amidst Economic Growth in Russia. *Journal of Business and Economic Options*, *6*(2), 18-22.
Wagner, A. (1893). Three Extracts on Public Finance, in R. A. Musgrave and A. T. Peacock eds1958. Classics in the Theory of Public Finance, London: Macmillan.
Yan, K., & Chen, J. (2019). Human Capital Dynamics and Economic Growth: A Panel Data Analysis of Eleven Countries. *Journal of Business and Economic Options*, *2*(3), 105-114.
Zhang, W. B. (2020). Integrated Analysis of Economic Growth and Land Prices: A Two-Sector Model Approach. *Journal of Business and Economic Options*, *3*(3), 107-110.