

The Relationship Between Government Revenue and Expenditures in Saudi Arabia

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Abstract:

Public sector plays a dominant role in developing countries, especially when the goal is to stimulate the economy and use government budget to establish and pursue national objectives.

This study attempts, by using recent developments in econometrics, to establish the causal relationship between government revenue and expenditures. That is which causes what? Is government expenditure driven by increases in its revenue? or that revenue is caused by increases in government expenditures. Or that there is no relationship between them. This is an empirical issue since there is no consensus on a theoretical base and that most empirical results are mixed.

This study asserts that in the case of Saudi Arabia, the results show that there is one way direction of causality running from government revenue to its expenditure. This finding is important for policy makers, since the government for the past 16 years has been running a huge deficit in some years. Thus, these findings have important implications for controlling and may be reducing budget deficit and in turn national debt.

Introduction

Public sector plays a dominant role in developing countries, especially when there is a desire to stimulate and guide economic and social development. Thus, Schick (1990) suggests that over time government budget has taken on functions so that it does much more than allocate money to programs and agencies, governments use it to establish and pursue national objectives. However, with increasing

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budget deficits 'just as budgeting once enhanced political and managerial capabilities it has the potential to weaken them'.

To achieve the budgetary goals there is a need for revenues and receipts. Since creating a government budget also requires choosing an overall level of spending and allocating different amounts for different programs, as well as choosing the means of raising revenue, tax system is often identified as one of the most powerful lever available to governments in developed countries, however, the characteristics of developing countries impose severe limits on the structure of the tax system. Because of the low per capita income and numerous exemptions, the base for direct taxes is low and it is much hard to collect, as such these governments rely heavily on indirect taxes, as customs duties and trade taxes. (See for example, Hinrich, 1965; Hamilton and Flavin, 1986; Afxentoiou, 1980; Goode, 1984; Cordes et.al. 1990 ; Wildavisky, 1992 and Trehan and Walsh, 1988).

In most countries the bulk of the governments' revenues derives from various taxes generated from private sector economic activities. In contrast, one of the unique features of the Saudi Arabian economy is that government revenue from oil determines its fiscal decisions, which in turn determines income and expenditure and performance of the economy as a whole. This is so because almost all of the government's revenue comes from income generated from oil available to the government since it owns natural resources - including oil- in the country. For the period 1970-1983 these revenues accounted for between 85 per cent and 98 per cent of the government annual income. After 1984 this fraction has fallen sharply and the government resorted to other sources of revenue which included running a deficit and borrowing from domestic financial and capital markets (see, Looney, 1991 and Krimly, 1999). Government expenditures consist of public consumption and investment where spending on public investment comes under the following categories: economic resources development, human resources development, health and social development, transportation and communications, and municipalities and housing.

Since developing a government budget requires not only choosing the overall level of revenue but allocating it among different projects and programs, it is important to examine the relationship between the amount of resources absorbed and allocated by the government and their relationships with its basic policy goals. Thus, it is important to see what causes what, that is, the direction of causality between revenues and expenditures. Clearly, evidence of one way causality from revenues to expenditures would imply that higher revenues lead to higher expenditures. On the other hand, evidence of unidirectional causality in the opposite direction- expenditures to revenues- would confirm the belief that increases in the budget is initiated by changes in expenditures.

Most of the empirical literature on this subject has focused on the US experience, with few studies directed towards examining the case of other large industrialized countries. Even though the problem may be more serious for developing countries, there has been few attempts to study the interrelationship between government spending and taxation for these countries (for more discussion see, Darrat, 1998; Park, 1998; Huang and Tang, 1992; Mithani and Khoon, 1999; and Kollias and Makrydakis, 2000).

Given the fact that budgetary revenue and expenditure in Saudi Arabia increased steadily during the 1970's, nevertheless, oil price adjustments in the 1970's, world recession, fluctuations in world demand for oil, and political instability caused by Gulf crises have led to sizeable fluctuations in revenues compared with expectations. Moreover, identifying and understanding the relationship between government expenditures and revenues can contribute toward a better understanding of the consequences of the large deficit in Saudi Arabia and the policy implications of such a relationship. Thus, the aim of the paper is to examine and to focus on the causal relationship between two major components of government finance, revenues and expenditures, in the case of Saudi Arabia. Moreover, The identification of the direction of the causality between government revenues and expenditures provides insight to how different policies might, or might not, help to control the growth of the

government. Using annual data for the period 1964-1997 the properties of the individual variables and the order of integration of the data is examined by using augmented Dickey-Fuller (ADF) test. Then given the significant implications that cointegration has for econometrics analysis the hypothesis of long run relationship between government revenue and expenditure is tested using Engle-Granger (1987) Cointegration test to investigate this relationship. The information content of the cointegrating relationship then is used to examine the short run dynamics implied by the associated error correction model (ECM) as suggested by Engle and Granger (1987).

Literature Overview

The dynamic relationship between government revenues and expenditures has been widely discussed and analyzed during the last three decades. At least two major reasons are given for this interest. The first and the most important one is the rather dramatic and remarkable growth which characterized public sector in developed and less developed countries in recent history and the second is the growing budget deficits of central and local governments in these countries.

There are four main hypotheses regarding the intertemporal links between government revenue and expenditures: (1) revenues lead expenditures. Friedman (1978), Ward (1982), Buchanan and Wagner (1977, 1978) and Wagner (1976) claim that high deficits lead to higher spending and that expenditures adjust to whatever level that can be supported by revenues. However, Buchanan and Wagner suggest that government grows because when spending is financed by other than direct taxes, people falsely perceive government services price to be less than what it really is and Winer (1982, 128) indicates that, 'The evidence is that the positive effect on local spending of an unconditional grant outweighs the negative impact of an equivalent increase in federal taxes.' However Friedman points out that politicians would hesitantly decide to increase

taxes in order to finance an increased level of spending, but as long as, in one way or another, a situation of cash availability arises, the result will be an increased level of spending. On the other hand Hamilton and Flavin (1986) conclude that in order for the government to be able to issue interest bearing debt, it must promise to balance its budget in expected present value terms. (2) expenditures lead revenues. Barro (1979) and Peacock and Wiseman (1979) suggest that spending precedes taxes. Barro (1979) believes that tax smoothing model implies that causation runs from expenditure to revenues. (3) revenues and expenditures are jointly determined. In this case tax rates and expenditures are selected simultaneously depending on balanced marginal cost and marginal benefits. (4) revenues and expenditures are independent of each other. This is consistent with the finding of Hoover and Sheffrin (1992) and Hall (1978) in which current expenditure is determined solely by past expenditure, or that of Hoover and Sheffrin (1992) in which tax and spending levels are set by rules of thumb.

The causal relationship between government revenue and expenditures have been the subject of a large number of studies. Manage and Marlow (1986), Blackley (1986), Anderson et. al (1986), von Furstenberg et. al (1986), Bohn (1991), Hoover and Sheffrin (1992), and Baghestani and McNown (1994) investigated the relationship in the case of the US federal government, Marlow and Manage (1987), Joulfaian and Mookerjee (1990a) and Jones and Joulfaian (1991) concentrated on US state and federal governments. Arghyrou (1998), Hondroyiannis and Papapetrou (1996), Kollias and Makrydakis (1995) and Provopoulos and Zambaras (1991) used data for Greece, Kollias and Makrydakis (2000) investigated the case of Greece, Spain, Portugal and Ireland, Joulfaian and Mookerjee (1990b) studied OECD countries, Owoye (1995) tested data for G7 countries and Tridimas (1992) for UK. Recently, Park (1998) and Darrat (1998) studied the cases of Korea and Turkey respectively,

Dahlberg and Johansson (1998) used panel data to study the case of Swedish municipalities and Mithani and Khoon used seasonal cointegration test to investigate the case of Malaysia. Unfortunately, the empirical results are mixed. Manage and Marlow (1986) tested for causality between taxes and expenditures for the 1929-82 period and concluded that their results support cases of unidirectional causality from taxes to expenditures. In contrast, Anderson et al. (1986) concluded that government expenditures Granger cause government taxes. Using different econometrics techniques von Furstenberg et al. (1985, 1986) used the vector autoregression (VAR) model to analyze the tax and spend issue on quarterly data for the period 1954-82. Their results supported the findings of Anderson et al. Along the same line, Ram (1988a) applied conventional Granger causality test to examine the issue of taxes and expenditures at the federal, state and local levels of government using annual and quarterly data for 1929-82 and 1947-83 respectively. The conclusion was that taxes Granger cause expenditures at the federal level, but in opposite direction at the state and local level. While the results at the federal level confirm Manage and Marlow's findings, the results at the state and local level support the findings by Anderson et al. Evidence from Swedish municipalities by Dahlberg and Johansson (1998) also support these findings by Anderson et al (1986) and Ram (1988a). Miller and Russek (1990) reexamined the causality issue using cointegration and error correction models (ECM), which provided additional channels through which Granger causality could emerge. They applied these techniques to quarterly data for the U.S. and concluded that causality runs both ways between taxes and expenditures at all levels of government. Owoye (1995) also found evidence of bidirectional causality between taxes and expenditures in the U.S., Germany, U.K. France and Canada. The results for the U.S. are consistent with the finding by Miller and Russek (1990). In the case of Japan and Italy, the results show that causality runs from

taxes to expenditures which support the findings by Manage and Malow (1986). Park (1998) using parametric and nonparametric causality tests for Korea found that there exists causal relationship from government revenue to government expenditures. In different analysis of causal linkages between revenues and expenditures. In the case of Turkey (Darrat, 1998) and Taiwan (Huang and Tang, 1992) evidence of causality was found to be running from taxes to expenditures. Darrat (1998), suggests that his results support the existence of one nonzero cointegration vector representing a long run equilibrium relationship between the fiscal variables. "Moreover, evidence from multivariate error correction models suggests that taxes unidirectionally and significantly Granger cause government spending, both in the short run and long run." Based on these results he rejects the spend and tax in favor of the tax and spend proposition. Hoover and Sheffrin (1992) identify episode of taxation or expenditure policy change and isolate two periods of fixed regimes. During one of the fixed regimes periods, cointegration was found between revenues and expenditures, but no association between the two fiscal variables was found during the other fixed policy episodes.

The Saudi Arabian Economy, and Sources and Uses of Government Revenue

The economic system in Saudi Arabia is based on the principles of free economy where a substantial part of the production and distribution of goods and services is left to individuals and groups enjoying freedom in their dealings and transactions. Within the past 30 years, the Saudi Arabian economy has encountered dramatic changes due to increased oil revenues available to the government. Since then the economy became dependent on these revenues as the main source of income. Oil is a national wealth extracted and utilized by the government, there is no private ownership of oil or oil concessions. Revenues accruing from oil go to the national treasury to finance government expenditures and it is mainly through these

expenditures that oil revenues affect the economy, giving the government the ability to play a large role and a dominant influence on the performance of the economy. Thus, the government pursued development plans and spent massively during the period of 1973-1982, aiming on developing basic infrastructure and expanding social services. (For more information about the nature of the Saudi Arabian economy see for example, El Mallakh, 1982; Al Johany et al., 1986; Azzam, 1988; Persley, 1989; Askari, 1990 and Looney, 1990).

In most countries the bulk of the government's revenue derives from various taxes on the private sector of the economy. In contrast, in Saudi Arabia as mentioned above, almost all of the government revenue comes from income generated from oil revenue available to the government. Oil revenues have taken several forms. In the past they have fallen under one of two headings, royalties and income taxes, but recently after ARAMCO - the oil company - became a national company owned by the government they are interred as oil revenues. For the period 1970-1983 oil revenues accounted for between 85 and 98 percent of the government's annual income. After 1984 this fraction has fallen to about 75 percent, and the rest comes from other revenues which include: income from government investment abroad, general reserves, other sources of revenue, and lately borrowing from domestic market.

Other sources of revenues fall into the following categories: corporate and business income taxes, custom duties, charges for government services and miscellaneous revenues and Zakat. After a basic exemption income taxes payable by foreigners were levied on income earned in Saudi Arabia and ranged between 5 and 30 percent. These taxes were abolished in 1975.

Business profit taxes are payable by companies and by foreign participants in Saudi Arabian companies at rates that range from 25 percent to 45 percent. Oil companies are taxed at a uniform rate of 55 percent after making adjustments in gross revenues for royalties of 12.5 percent and cost of production. It should be noted that

companies established under the provision of the foreign capital investment law with Saudi Arabian participation of not less than 25 percent are exempted from income tax for 10 years from the date of commencement of production and on future expansions of investment. According to Islamic law Zakat is levied on Saudi nationals and firms and businesses owned by Saudi Arabian nationals on net worth minus fixed assets at a uniform rate of 2.5 percent per annum.

With respect to other revenues as noted by SAMA report in 1975, the government in 1974 and 1975 substantially reduced custom duties on large number of commodities and also abolished them on a number of other commodities along with the surcharges on all imports and other services. Custom duties were increased in late 1980's to a uniform rate of 12 percent on all commodities other than necessities. On January 1, 1995 the government announced measures to be taken in the 1995 government budget to generate more domestic revenues which include: 1) surcharge imposed on domestic consumption of all refined petroleum products. 2) the rates for monthly consumption of electricity and water were increased with the hope of rationalizing their consumptions and use. 3) fares for domestic travel on the national airline carrier - Saudia - were raised between 10 and 20 percent. 4) costs of telephone subscription and calls were increased for more than 100 percent. 6) fees for visas to enter the country and work and residence permits were increased more than 100 times. Again on May 3, 1999 the government announced an increase of 50% in price of gasoline and fees for visas to enter the country for work and residence permits were increased by 100%.

Government expenditures consist of government consumption and government investment. Total government expenditures have grown at a rate of about 38 percent per annum between 1970 and 1982. Expenditures on projects during that period grew at an annual compound rate of 44 percent, while recurrent expenditures grew at a compound rate of 32 percent. The following table presents actual government revenue (R), from oil revenue (OL) and other revenues (OT), actual expenditures (E), surplus (Sur +) and deficit (Def -) for selected years between 1970 and 1997 in billions of Saudi riyals (SR),

	1970	1975	1980	1985	1990	1995	1997
R	6.98	10.46	348.10	133.60	149.92	146.50	205.50
OL	5.86	96.64	319.30	88.40	118.14	105.70	160.00
OT	1.12	3.82	28.80	45.20	31.78	40.80	45.5
E	6.42	81.78	236.57	184.00	238.4	173.90	221.3
Sur, Def	+ 0.56	+ 18.68	+111.43	-50.40	-88.48	-27.40	-15.80

Source: Saudi Arabian Monetary Agency (SAMA) Reports, Different Issues.

Methodology

Several studies have examined time series variables properties and concluded that most macroeconomic time series data follow random walks. While Nelson and Plosser (1982) document that 14 major macroeconomic variables exhibit nonstationary behavior over time, Hall (1978) shows that aggregate consumption follows a random walk process.

Recent studies, Phillips (1986), Granger (1986), Granger and Newbold (1974), and Ohania (1988), among others, have demonstrated that if time series variables are nonstationary, all regression results with these series will differ from the conventional theory of regression with stationary series. That is, regression coefficients with nonstationary will be spurious and misleading. Thus, to avoid spurious relationships and misleading results and to provide a valid evidence to the issue of tax and spend or spend and tax, it is important to address the time series properties of the revenues and expenditure because any empirical analysis from which valid inferences could be drawn must ensure that all series are of the same order of integration in order to avoid the problem of spurious relationships and erroneous conclusions (Ericson, 1992). With respect to the causal relationship between revenues and expenditures, cointegration and error correction models of Engle and Grange (1987), are employed in this study.

Conventional Granger causality test indicates that a variable X_t

Granger cause Y_t if the lagged values of X_t help improve the forecast of Y_t . One of the problems of this procedure of test as pointed out by Miller and Russek (1990), and Miller (1991) is that it is possible to find no causal relationship between two variables that share a common trend. This is the case because a variable that exhibits nonstationarity will show no tendency to return to its long run equilibrium level in the event of a random disturbance and the causality test may lead to misleading results. Thus, one of the important features of the cointegration analysis over the conventional causality test is that if two variables are integrated of order one, that is $I(1)$, and cointegrated, then there must be a Granger causality in at least one direction because one variable can help predict the other.

It is possible that a variable is found not to cause another variable due to omission of other variables. This kind of bias is discussed by Lutkepohl(1982). To avoid this omission of variable bias a variable that theory suggests as potentially relevant for the determination of government revenues and expenditures; namely, real GDP as proxy for GNP, is incorporated as an additional variable. Studies that use GNP as a measure for controlling for macroeconomic activities include among others, Anderson et.al. (1986), Blackly (1986), von Furstenberg et.al (1986), Hoover and Sheffrin (1992), Baghestani and McKown (1994), and Darrat (1998).

Engle-Granger (1987) test for cointegration consists of two steps. The first is to test whether government revenue (R_t), government expenditures (E_t) and GDP (Y_t) are integrated of order zero $I(0)$, that is, whether R_t , E_t , and Y_t are stationary. This is accomplished by performing the augmented Dickey Fuller (ADF) test (Dickey and Fuller, 1979, 1981), which is based on the following regression equations of the form:

$$\Delta R_t = \alpha_0 + \beta_1 R_{t-1} + \sum \gamma_1 \Delta R_{t-1} + \varepsilon_t \quad (1)$$

$$\Delta E_t = \alpha_0 + \beta_2 E_{t-1} + \sum \gamma_2 \Delta E_{t-1} + \varepsilon_t \quad (2)$$

$$\Delta Y_t = \alpha_0 + \beta_3 Y_{t-1} + \sum \gamma_3 \Delta Y_{t-1} + \varepsilon_t \quad (3)$$

where Δ is the first difference operator, α , β , and γ are the coefficients and ε is the error term.

The null hypothesis is that R_t , E_t , and Y_t have unit roots, that is

$\beta_1 = \beta_2 = \beta_3 = 1$. The alternative hypothesis is that the variables are integrated of zero, $I(0)$. The null hypothesis is rejected if β_1 , β_2 , and β_3 are significantly negative and the t-statistics are greater in absolute values than the MacKinnon (1990) critical values.

The next step is to determine whether the stochastic trends in R_t , E_t and Y_t have long run relationship. This is accomplished by estimating the cointegration equation with R_t , E_t , and Y_t in level forms and test whether the residuals of the Engle-Granger cointegration regressions are stationary. These equations are in the following form:

$$R_t = \delta_1 E_t + \mu_{t1} \quad \text{and} \quad R_t = \delta_1 E_t + \theta_1 Y_t + \mu_{t1} \quad (4)$$

$$E_t = \delta_1 R_t + \mu_{t2} \quad \text{and} \quad E_t = \delta_1 R_t + \theta_1 Y_t + \mu_{t2} \quad (5)$$

where μ_t are the residuals to be tested for stationarity. The null hypothesis is that no cointegration and rejection or acceptance of this hypothesis is based on the results of equations (4) and (5).

In a multivariate context, Granger causality running from, say, revenues (R) to expenditures (E) can be tested by estimating:

$$E_t = \phi_0 + \sum \phi_1 E_{t-1} + \sum \phi_2 R_{t-1} + \sum \phi_3 Y_{t-1} + v_t \quad (6)$$

where v_t is a white noise error term, and the summations of ϕ 's are polynomials of appropriate orders for the three explanatory variables. Following Hsiao (1979, 1981) the Akaike's final prediction error (FPE) criterion to determine the proper lags for each variable is used. The null hypothesis that R_t does not Granger cause E_t is rejected if the summation of ϕ_2 is significant as a group. To test the hypothesis that E_t does not Granger cause R_t the following equation is used,

$$R_t = \xi_0 + \sum \xi_1 R_{t-1} + \sum \xi_2 E_{t-1} + \sum \xi_3 Y_{t-1} + v_t \quad (7)$$

That is the hypothesis that E_t does not Granger cause R_t is rejected if the summation ξ_2 is significant as a group.

Engle and Granger (1987), among others, have shown that if the variables are integrated of order one, $I(1)$, that is, if long term relationship exists between these variables, then they are said to be cointegrated. The Granger representation theorem states that in this

case, the variables may be considered to be generated by error correction models of the form:

$$\Delta R_t = \pi_0 + \Sigma \pi_1 \Delta R_{t-1} + \Sigma \pi_2 \Delta E_{t-1} + \Sigma \pi_3 \Delta Y_{t-1} + \lambda_1 \mu_{t-1} + \epsilon_{t1} \quad (8)$$

$$\Delta E_t = \rho_0 + \Sigma \rho_1 \Delta E_{t-1} + \Sigma \rho_2 \Delta R_{t-1} + \Sigma \rho_3 \Delta Y_{t-1} + \lambda_2 \mu_{t-1} + \epsilon_{t2} \quad (9)$$

where μ_{t-1} and μ_{t-2} are the error correction terms. The error correction coefficients, λ_1 and λ_2 are expected to capture the adjustments of R_t and E_t towards long run equilibrium, while ΔR_{t-1} and ΔE_{t-1} are expected to capture the short run dynamics of the model.

The error correction models given in equations (8) and (9) are used to test the causal relationship between revenues and expenditures since the inclusion of the error correction terms in these equations introduces additional channels through which causality could emerge and equilibrium could be reestablished in the event of shocks. In equations (8) and (9) the focus is mainly on the statistical significance of the error correction coefficients, λ_1 and λ_2 .

Data and Empirical Results

Even though conventional wisdom suggests that more observations are better, because more observations allow us for better discrimination among hypotheses, annual data are used in this study which cover the period 1964-1997. This is because most of the data used here are available only on annual base and as Hakkio and Rush (1991) and Shiller and Perron (1985) have suggested that, conventional wisdom needs to be taken with care, there is little gain from increasing observations using higher frequency with the same time span for data, but there is a gain from using the same frequency data with a longer time span of data. Thus, in their view the length of the time series is far important than the frequency of observations.

Actual government revenues (R), which consist of oil revenues (OL) and other revenues (OT), actual government expenditures (E), and Gross Domestic Product (Y) are obtained from Saudi Arabian Monetary Agency (SAMA) reports, different issues. The variables are in real and log terms.

Tables 1, 2, 3 and 4 present the empirical results. To determine the proper lags length for each variable the FPE criterion is used in

this study. Table 1 shows the results of augmented Dickey-Fuller (ADF) unit roots test and Engle-Granger (1987) cointegration test. It is clear from the unit roots test that the log level of each variable is non stationary. Thus, we can not reject the hypothesis of unit roots for all variables in level form. However, according to ADF stationarity test these variables are stationary when expressed in first differences of the log indicating that each variable is integrated of order one, $I(1)$. Results of the cointegration test in table 1 show also that these variables are cointegrated when expressed in log level and we can reject the hypothesis of no cointegration between these variables. Because all the variables have been proven to be stationary when differenced and integrated of order one $I(1)$ as the results show, the differenced series are $I(0)$, or stationary. Thus, these results indicate that a long run relationship exists between variables. Tale 2 shows the results of Granger causality test performed on log levels. These results suggest that there is unidirectional causality running from government revenue to government expenditure, especially from oil revenue. Other revenues show the opposite, that is government expenditure causes other revenues. Even though government expenditures cause GDP, the later variable causes government revenue (R) and government expenditures and other revenues (OT). Table 3 presents the results of the error correction test. The coefficients of the government revenue (R) and oil revenue (OL) are significant at the 1 percent level indicating the tendency of these variables to restore to equilibrium. These results also introduced additional channels through which Granger causality has emerged. Table 4 shows the results of the causality tests from VAR model which indicate that these variables can be forecasted from their own lags and that lagged revenues (especially oil revenues) affect government expenditures. Thus, as Sims (1982) has suggested, a variable can be optimally forecast from its own lags.

Based on the causality test and the error correction model estimates it can be said that these results support the contention that higher revenues, especially oil revenues, would lead to higher expenditures. Thus, we can accept the tax and spend hypothesis.

That is for Saudi Arabia government revenue causes its expenditure. These results are in agreement with the results obtained by Huang and Tang (1992) for Taiwan, Park (1998), Owoye (1995) for Italy and Japan, and Darrat (1998) for Turkey, Vamvoukas (1997), Kollias and Makrydakis (1999) for Greece, Mithani and Khoon (2000) for Malaysia, and also with Holtz-Ekin, Newey and Rosen (1989) who suggest that past revenues predict current expenditures.

Table 1 Unit Roots and Cointegration Tests

ADF Unit Roots Test			Cointegration Test	
Variables	Levels	Defferenced		
			$E = f (R)$	-4.91*
R	-3.026	-5.358*	$E = f (OR)$	-5.07*
E	-2.667	-4.809*	$E = f (OT)$	-5.08*
Y	-2.006	-5.186*	$E = f (Y)$	-5.46*
OL	-2.883	-4.666*	$E = f (R, Y)$	-5.60*
OT	-1.442	-5.199*	$E = f (OR, Y)$	-5.46*
			$E = f (OT, Y)$	-5.43*
			$E = f (OR, OT, Y)$	-5.43 *
			$R = f (E)$	-3.798**
			$R = f (E, Y)$	-3.88*
			$OR = f (E)$	-3.77**
			$OT = f (E)$	-4.104**
			$Y = f (E)$	-1.79

In all Tables:

* significant at 1 % level, Mckinnon critical values for: 1% -4.295, 5% -3.567, 10% -3.217

** significant at 5% level, Unit Roots Test 10% -3.217

*** significant at 10% level. For Cointegration Tests 1% -4.258, 5% -3.533, 10% -3.179

Table 2 Granger Causality Tests

Var.\Lag	1	1	3	Var.\Lag	1	2	3
R = > E	6.23*	20.44*	13.40*	OR = > E	5.47**	2.61***	2.14***
E = /> R	0.11	0.54	0.42	E = /> OR	0.06	0.021	0.033
OT = /> E	0.01	0.26	0.16	Y = > E	1.39	3.02**	2.32***
E = > OT	6.07*	4.33*	3.612**	E = /> Y	0.05	0.57	0.22

= > Granger Cause, = /> is not Granger Cause.

Table 3 Error Correction Results

	$\Sigma\Delta Et-1$	$\Sigma\Delta Rt-1$	$\Sigma\Delta ORt-1$	$\Sigma\Delta Yt-1$	ut-1
ΔEt	-0.368**	-0.072**	-	-	-0.72*
	-0.334**	-	-0.027	-	-0.95*
	-0.345**	-0.136**	-	-0.488	-0.849*
ΔRt	0.20	-0.24	-	-	-0.68

Table 4 Granger Causality Tests from VAR Model

To \ From	E	R	OR	OT	Y
E	0.93*	0.29**	0.17**	-0.04	0.23
R	0.05	0.88*	0.17	-0.09	0.25
OR	0.03	0.23	0.91 *	-0.02	0.25
OT	0.84**	0.41	0.35	0.86*	1.36
Y	0.01***	0.02	0.02**	0.01	0.98*

Conclusion and Policy Implications

This study attempts to analyze the relationship between government revenues and expenditures in Saudi Arabia and applies cointegration and error correction models to test the causal relationship between these variables. Unlike previous studies which use bivariate models, this study uses multivariate model by including GDP to avoid the problem of rejecting the causality because of the omission of important variables.

Empirical results obtained from the Engle-Granger cointegration, Granger causality tests, and error correction models indicate that there is a long run relationship between these variables and that the causality runs from government revenues to government expenditures. This implies that in Saudi Arabia the decision to spend depends on revenues. Thus these results suggest that higher revenues lead to higher government expenditures. It can be said also that higher oil revenues are expected to increase government expenditures.

It can be assumed that policy makers in Saudi Arabia tend to be cautious by relying heavily on revenues generated from oil and resort to other revenues as a last source of revenue. That is, the government seems to resist the temptation of spending now and taxing later. This conclusion is important for the sake of controlling and reducing the large and fluctuating deficit in the future and in turn reducing national debt.

Finally, the existence of a one way causality from government revenues to government expenditure indicates the importance of fiscal activities in Saudi Arabia. Thus, the government can use its receipts and outlays as fiscal instruments to stabilize the economy. It is important for the government to use the budget to establish and pursue national objectives and to assess past performance and to plan for the future.

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