العنوان:	Government Expenditure and Economic Growth in Saudi Arabia : An Empirical Investigation
المصدر:	دراسات - العلوم الإدارية
الناشر:	الجامعة الأردنية - عمادة البحث العلمي
المؤلف الرئيسي:	Al Hoqubani, Mofarrej S.
المجلد/العدد:	مج31, ع1
محكمة:	نعم
التاريخ الميلادي:	2004
الصفحات:	180 - 188
رقم MD:	661216
نوع المحتوى:	بحوث ومقالات
قواعد المعلومات:	EcoLink
مواضيع:	الانفاق الحكومي، التنمية الاقتصادية ، السعودية
رابط:	http://search.mandumah.com/Record/661216

Dirasat, Administrative Sciences, Volume 31, No. 1, 2004

Government Expenditure and Economic Growth in Saudi Arabia: An Empirical Investigation

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ABSTRACT

This paper uses cointegration methodology and causality tests to examine the relationship between government expenditure and economic growth in Saudi Arabia. It uses annual data covering the period 1969 – 2000. The results signify that real government spending and real GDP are cointegrated. It also reveals that there exists a bi-directional causality between government spending and economic growth and between oil GDP and government spending in Saudi Arabia.

I. INTRODUCTION

The nature of the relationship between economic growth and government expenditure has received considerable attention from economists and financial scientists. In practice, the relationship between these important two variables is questioned at two levels. First, the nature of causality between government spending and economic growth is still under investigation. Several studies have empirically tested the relationship between public expenditure and economic growth for various countries using time series and cross-sectional data. While some of these studies adopted the Keynesian proposition (Romer, 1986; Lucas, 1988; Singh and Sahni, 1984), others questioned the existence of what is called Wagner's Law owed to Adolph Wagner in 1883, (Bird, 1971; Gould, 1983; Holmes and Hutton, 1990). Second, the issue of whether the government has a positive or negative impact on aggregate economy has been repeatedly examined. Landau (1989), Barro (1987), Peden and Badlly (1989), and Meguire (1985) are just an example of quite a lot of researchers that examined this question.

In this paper, we intend to deal with the former question in an attempt to determine the nature of the relationship between government expenditure and economic growth proxied by some national aggregates e.g. Gross Domestic Product (GDP) in Saudi Arabia. Our main emphasis is to investigate whether the Saudi Arabian case supports Wagner's Law or goes along with Keynesian approach. The main motivation behind this paper is that, for the case of Saudi Arabia - to the best of my knowledge -such way of analysis has not been performed before. Previous works such as that of Al-Yousif (1994) habitually ignore time series properties of the data when building the models. It is now apparent that when we use nonstationary time series in our regression model, we might end up with spurious regression accompanied with ambiguous regression results. Therefore, we will make use of several tests to inspect the stationarity of our variables before conducting our causality tests. These tests will help us in building our model and in acquiring trustworthy results.

The formation of this paper is laid as follows: the first section gives a brief discussion of Wagner's Law. The second section will discuss our empirical approach and give descriptive statistics. The third section reports the results of several regressions which represent versions of Wagner's Law. The final section will be devoted to our concluding remarks.

II. Theoretical Setting

The long run relationship between economic growth and government expenditure has attracted considerable attention in economic research. Wagner (1883) presented a model of the determination of public expenditure in which public expenditure is a natural outcome of economic growth (Demirbas, 1999). According to Wagner, there exists a long run propensity for public

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Received on 25/6/2002 and Accepted for Publication on 28/5/2003.

expenditure to grow relative to some national aggregates such as GDP (Jackson et al., 1998). It follows that the government expenditure in Wagner's proposition is treated as an endogenous variable that is affected by growth of economy. Wagner's Law has received considerable attention in academic field and has been tested by many researchers using time series and cross-sectional data. Musgrave (1969), Bird (1971), Krzyanaik (1974), Ram (1987), Demirbas (1999), Khaleel and Allouzi (1999), Sahni and Singh (1984), Jackson et al. (1998) are some researchers who attempted to test Wagner's Law. The study of Al-Yousif (1994) attempted, through utilizing the theoretical framework proposed by Ram, to investigate whether the size of government contributes to or impedes economic growth in Saudi Arabia. The results of this study locate evidences for positive relationship between the size of government and economic growth in Saudi Arabia.

While Wagner's Law assumes the causality to run from economic growth to government expenditure, Keynesian approach deals with government expenditure as an exogenous variable that affects economic growth and hence, the causality should run from government spending to economic growth. The Keynesian proposition on public expenditure received great attention after the great depression of 1929 especially in developing countries. In developing countries, government spending is seen as a base for economic growth because government sector is functioning as the main provider of several goods and services. Empirically, Linadauer and Velenchik (1992) did not find any strong correlation between government expenditure and economic growth in the developing countries. Rubinson (1977) used a sizable cross-country sample and found that a large government size promotes economic growth especially in the poorer, less developed countries. In Saudi Arabia, with its huge oil sector, the nature of the relationship between government spending and economic growth will be investigated in the following sections.

III. Empirical Methodology

1- Unit Root Test

In order to obtain reliable regression results, we first need to make sure that our model could not be subject to "spurious regression" first discussed by Granger and Newbold (1974). The problem of spurious regression arises because time series data usually exhibit non-stationary tendencies and as a result, they should have non constant mean, variance and autocorrelation as time passes (Arize,1994). Violating the properties of the time series could lead to non consistent regression results with misleading coefficients of determination (R^2) and other statistical tests. Therefore, we first need to establish stationarity properties of the variables used in our model using Dickey – Fuller (1976) and augmented Dickey – Fuller Unit Root Tests (1979, 1981).

A series (X_t) is said to be integrated of order (d) denoted by $X_t \sim I(d)$ if it becomes stationary after differencing d times and thus X_t contains d unit roots. If $d = 0$, then X_t is said to be integrated of degree zero and stationary at level. To determine whether a series is stationary or nonstationary, unit root tests developed by Dickey and Fuller are utilized.

The augmented Dickey – Fuller test is based on the estimates of the following regression equations [1]:

1-for levels:

$$\Delta X_t = \alpha_0 + \alpha_1 t + \alpha_2 X_{t-1} + \sum_{i=1}^{k} \alpha_i \Delta X_{t-i} + \xi_t \qquad (1)$$

2-for first difference:

$$\Delta\Delta X_t = \alpha_0 + \alpha_1 t + \alpha_2 \Delta X_{t-1} + \sum_{i=1}^{k} \alpha_i \Delta\Delta X_{t-i} + \xi_t \qquad (2)$$

where ΔX_t is the first difference operator of the series and equals to ($X_t - X_{t-1}$), t is the linear time trend, ξ is normally distributed error terms, k is the number of lags which should be large enough to ensure the error terms (ξ_t) are white noise process and small enough to save degrees of freedom. In this paper, the number of lags will be chosen based on AIC and SBC selections.

The null and alternative hypotheses in equation (1) and (2) can be stated as follows:

$H_0 : \alpha_2 = 0$

$H_1 : \alpha_2 \neq 0$

If the calculated $t-ratio$ of the estimated α_2 is greater than the critical $t-value$, the null hypothesis of unit root (nonstationary variable) is rejected indicating that the variable is stationary at level and integrated of degree zero denoted by I(0).

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1 There are three different forms that equation (1) and (2) could take:

1- Pure random walk if $\alpha_0 = \alpha_1 = 0$.

2- Random walk with drift if $\alpha_0 \neq 0$ and $\alpha_1 = 0$.

3- Random walk with drift and deterministic trend if $\alpha_0 \neq 0$ and $\alpha_1 \neq 0$.

If it is found that the individual time series is nonstationary at level, a transformation of the variable, usually in the form of differencing, is needed until we achieve stationarity (if possible) that is to achieve non-autocorrelated residuals [2].

2- Cointegration Test

Engle and Granger (1987) introduced the concept of cointegration in which economic variables may reach a long run equilibrium that depicts a stable relationship among them. For the case of two variables, X and Y are said to be cointegrated if both are integrated of order (1) and their exists a linear combination of the two variables that is stationary I ~ (0). The linear combination is given by either equation 3 or 4:

$$y_t = \sigma_0 + \sigma_1 x_t + \mu_t \quad (3)$$

$$x_t = \beta_0 + \beta_1 y_t + \zeta_t \quad (4)$$

The first and most straightforward approach to test for cointegration is the two - step approach suggested by Engle and Granger (1987). This test can be conducted as follows:

1- Test for the order of integration of the variable involved in the postulated long run relationship such that of equation (3) and (4). If the equation contains only two variables, they must have the same order of integration. If there are more than two variables, the order of integration of the dependent variable cannot be greater than any of the explanatory variables.
2- Estimate the static cointegration regression model using the Ordinary Least Square (OLS), and use the following Dickey – Fuller or Augmented Dickey – Fuller equations to test for the stationarity of the residuals obtained from the cointegration regression model:

$$\Delta\hat{\mu} = \eta.\hat{\mu}_{t-1} + \varepsilon_t \quad (5)$$

$$\Delta\hat{\mu} = \eta.\hat{\mu}_{t-1} + \sum_{i=1}^{k}\eta_i.\hat{\mu}_{t-i} + \varepsilon_t \quad (6)$$

If the residual is found to be stationary I(0), one can accept the existence of a stable long run relationship between the variables included in the model (Charemza and Deadman, 1992).

Another test that can be used in testing the existence of the cointegration relationship is that of Johansen (1988) and Johansen and Juselius (1990). According to this test, there are two test statistics for the number of cointegration vectors, the trace test (λ_{trace}) and the maximum eigenvalue statistics ($\lambda_{\max}$) (Rao, 1994). The trace test tests the null hypothesis that the number of cointegration vectors is less than or equal to k where k is 0,1,2. In each case, the null hypothesis is tested against the general unrestricted alternative ($k = r$)[3]. The critical values for these tests are tabulated by Johansen and Juselius (1990) (Rao, 1994).

Kremers, Ericsson and Dolado (1992), argued that the performance of Johansen tests is preferable to that of the standard two-step Engle – Granger test. The reason for this argument is that the latter test provides only one cointegration vector while the former test provides all cointegration vectors. In addition, since Engle – Granger

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2 It is important to mention that we do not follow, in testing our hypothesis, the usual t-distribution which is formulated as:

$$t = \frac{\hat{\phi} - 1}{se(\hat{\phi})}$$

since it will not hold when H_0 is true. In this case, the distribution of the statistics is not asymptotically normal, or even symmetric. The conventional testing assumes X_t stationary but it is not when H_0 is true and, therefore, it is not appropriate for unit root test. Dickey and Fuller (1979) developed a valid test for unit root which is still based on the conventional statistics, but special tables must be used to take account of nonstationary time series under the null hypothesis (Banerjee, 1993).

3 This test is calculated as follows:(Lutkepohl et al., 2001)
Denote the residuals from regressing ΔX_t and X_{t-1} on ΔX_{t-1}^{t-p+1} by R_{0t} and R_{1t}, respectively, and define:

$$S_{ij} = T^{-1}\sum R_{it}R'_{jt} \,(i, j = 0,1).$$

Denote the ordered (generalized) eigenvalues from solving $\det(\lambda S_{ij} - S_{10}S_{00}^{-1}S_{01}) = 0$ by $\lambda_1 \geq \cdots \geq \lambda_n$. The trace test is now given to be:

$$\lambda_{trace}(r_0) = -T\sum_{j=r_0+1}^{p}\log(1-\hat{\lambda}_j) \quad (7)$$

Where $\lambda_{r+1,\ldots,}\lambda_n$ are the smallest value eigenvectors ($p = r$).

In the maximum eigenvalue test, the null hypothesis $k = 0$ is tested against the alternative that $k = 1$ and $k = 1$ against $k = 2$ etc. This test is given by the following equation:

$$\lambda_{\max}(r_0) = -T\log(1-\hat{\lambda}_{r_0+1}) \quad (8).$$

Table (1): Augmented Dickey – Fuller Unit Root Test for Levels Including an Intercept and Linear Trend.

Variable	ADF(0)	ADF(1)	ADF(2)
GDP t-statistic	-3.476	-3.219	-3.145
AIC	45.84	45.89	44.95
SBC	43.79	43.15	41.53
RGX t-statistic	-3.252	-3.192	-3.521
AIC	41.08	44.39	44.54
SBC	39.03	41.65	41.12
OGDP t-statistic	-1.554	-1.772	-2.412
AIC	12.56	12.22	13.86
SBC	10.51	9.49	10.45
RGG t-statistic	-1.779	-1.900	-1.905
AIC	37.32	36.69	36.80
SBC	35.27	33.94	32.38

95% critical value for the augmented Dickey – Fuller statistics = -3.573
AIC = Akaike Information Criterion
SBC = Schwartz Bayesian Criterion
(* *) 0, 1,2 are numbers of augmentation

procedure consists of two step estimates, any error introduced in the first step, will likely affect estimates of the second step.

In order to avoid these pitfalls, we will apply Johansen procedure in our test for cointegration.

3- Granger Causality Test:

The concept of causality due to Granger (1969) is appropriate and used by most for testing the relationship between economic growth and government expenditure. According to Granger, variable X is Granger cause of variable Y (denoted as $X \rightarrow Y$), if present Y can be predicted better from past values of X rather than by not doing so, ceteris paribus (Charemza and Deadman, 1992).

For the case of two variables, the causality can take one of the following four directions:

1- Unidirectional causality from X to Y denoted as $X \rightarrow Y$.
2- Unidirectional causality from Y to X denoted as $Y \rightarrow X$.
3- Bi-directional causality between Y and X.
4- No causality between Y and X.

For a simple bivariate model, we can test the existence of any of the above direction of causality by estimating the following equations:

$$X_t = \delta_0 + \sum_{i=1}^{m} \delta_i X_{t-i} + \sum_{j=1}^{n} \delta_j Y_{t-j} + \varepsilon_t \quad (9)$$

$$Y_t = \delta_0 + \sum_{i=1}^{m} \delta_i Y_{t-i} + \sum_{j=1}^{n} \delta_j X_{t-j} + \mu_t \quad (10)$$

where ε_t and μ_t are uncorrelated error terms. We test the hypothesis that variable Y is Granger cause of variable X and variable X is Granger cause of variable Y by using the following hypothesis:

$H_0 : \delta_j = 0$ for $j = 1, \cdots, n$

$H_1 : \delta_j \neq 0$ for at least one j

In all cases, we will make use of the standard F test to determine the track of causality.

4- The Model:

To test for causality between government expenditure and economic growth in Saudi Arabia, we build our model in three different versions that can be represented as follows:

First version due to Peacock – Wiseman (1968):

$Lrgx = \alpha_0 + \alpha_1 Lgdp$

Second version due to Mann (1980):

$Lrgg = \alpha_0 + \alpha_1 Lgdp$

Third version: modified version to take into account the importance of oil sector in Saudi Arabia:

$Lrgx = \alpha_0 + \alpha_1 Logdp$

where:

rgx = real government expenditure.

gdp = real gross domestic product.

rgg = ratio of real government expenditure to real GDP

$ogdp$ = real oil gross domestic product.

L = natural logarithm.

The above versions will be tested to determine the nature of causality between variables included in each version. For ADF, cointegration, and causality test, we used Microfit 4.0 software package.

5- The Data:

Data of the variables included in our model are obtained from the thirty seventh annual report published in 2001 by Saudi Arabian Monetary Agency (SAMA). The available data cover the period from 1969 to 2000.

IV. Empirical Results:

1- Results of Unit Roots Test

Most time series studies used the Ordinary Least Square (OLS) to analyze the relationship between government expenditure and economic growth. And it has been mentioned earlier, this technique will lead to reliable regression results, if and only if, the series included in the model are stationary. But, since most of time series are not stationary at levels, a necessary step when testing for cointegration and causality is to test for the stationarity of the series included in the model. Table (1) shows the results of unit root test utilizing the augmented Dickey – Fuller test.

Results from table (1) indicate that in the case of levels of the series, the null hypothesis of unit root can not be rejected for any of the variables and hence, one can safely conclude that all series are not stationary at levels. Since we believe that all variables are trended, we included linear trend in the estimates to take into account the impact of trend on the movement of the series.

To complete our test, we apply the same test to the first differences to see whether we can achieve stationarity of the variables by transforming the series involved. The test includes intercept and no linear trend as we believe that the first differences are not trended. Results of the latter test are shown in table (2).

Results from table (2) show that the calculated t-statistics are greater than the critical t- values at the 95% level of significance for all of the variables. With these results in mind, the null hypothesis that the series have unit roots in their first differences are rejected which means that the variables are stationary at their first differences i.e. (they are integrated of order zero i.e. I~(0) at their first differences). It is worth mentioning that stationarity for the oil GDP is obtained only when the number of lags is zero.

2- Results of Cointegration Test

For the identification of possible long run relationship between the series included in the model, the method of Johansen (1988) and Johansen and Juselius (1990) is applied. In table (3), we report the results of Johansen's trace test (λ_{trace}) and maximum eigenvalue test ($\lambda_{\max}$) for the existence of long run relationship. Results in this table show that it is possible to accept the hypothesis that the variables involved are cointegrated and there exists a stable long run relationship between them.

Results from table (3) indicate the null hypothesis of the trace test (λ_{trace}) that ($r = 0$) is rejected for all of the cointegration vectors, since the calculated values are greater than the critical values for this test. For the maximum eigenvalue test ($\lambda_{\max}$), the null hypothesis that ($r = 0$) is not rejected for cointegration vector (RGX-OGDP) while it is rejected for the other two cointegration vectors. Results for the two test exclusively reject the alternative that ($r = 2$) since for this alternative, the critical values are greater than the calculated values. These results allow us safely to accept the existence of a single cointegration vector in our model.

Table (2): Augmented Dickey – Fuller Unit Root Test for First Difference Including an Intercept and No Linear Trend.

Variable	ADF(0)**	ADF(1)	ADF(2)
GDP t-statistic	-4.055*	-3.197**	-2.696
AIC	41.92	41.13	40.53
SBC	40.53	39.13	37.86
RGX t-statistic	-4.577*	-4.438*	-2.678
AIC	5.56	5.75	5.30
SBC	4.23	3.75	2.63
OGDP t-statistic	-4.879*	-2.920	-2.589
AIC	12.32	12.23	11.24
SBC	10.98	10.24	8.57
RGG t-statistic	-4.698	-3.821*	-3.419
AIC	33.84	32.95	32.02
SBC	32.51	30.95	29.36

95% critical value for the augmented Dickey – Fuller statistics = -2.970
AIC = Akaike Information Criterion
SBC = Schwartz Bayesian Criterion
(*) significant at 95%
(**) 0,1,2 are numbers of augmentation

3- Results of Causality Test

The next step is to test the causality between the variables included in the model. According to Wagner's Law, public expenditure growth is a product of economic growth and therefore, the causality should go from Gross Domestic Product (GDP) to government expenditure (RGX), from Gross Domestic Product (GDP) to RGG and from oil GDP to RGX. However, the Keynesian's approach suggests reverse causality to that postulated by Wagner's Law. According to the Keynesian's approach, government spending is an instrumental variable through which the government can affect the movement of the GDP. Thus, in the relation to the Keynesian's approach, one would expect the causality to be from government spending to economic growth. In order to determine the direction of causality between the variables involved, equations (9) and (10) are rewritten in their first differences as follows:

1- For causality between GDP and RGX

$$\Delta rgx_t = \delta_0 + \sum_{i=1}^{m} \delta_i \Delta rgx_{t-i} + \sum_{j=1}^{n} \delta_j \Delta gdp_{t-j} + \varepsilon_t \quad (11\text{-a})$$

$$\Delta gdp_t = \delta_0 + \sum_{i=1}^{m} \delta_i \Delta gdp_{t-i} + \sum_{j=1}^{n} \delta_j \Delta rgx_{t-j} + \mu_t \quad (11\text{-b})$$

2- For causality between GDP and RGG

$$\Delta rgg_t = \delta_0 + \sum_{i=1}^{m} \delta_i \Delta rgg_{t-i} + \sum_{j=1}^{n} \delta_j \Delta gdp_{t-j} + \varepsilon_t \quad (12\text{-a})$$

$$\Delta gdp_t = \delta_0 + \sum_{i=1}^{m} \delta_i \Delta gdp_{t-i} + \sum_{j=1}^{n} \delta_j \Delta rgg_{t-j} + \varepsilon_t \quad (12\text{-b})$$

3- For causality between OGDP and RGX

$$\Delta rgx_t = \delta_0 + \sum_{i=1}^{m} \delta_i \Delta rgx_{t-i} + \sum_{j=1}^{n} \delta_j \Delta ogdp_{t-j} + \varepsilon_t \quad (13\text{-a})$$

Table (3): Cointegration Test with Unrestricted Intercept and No Trend in the VAR.

Variables	Null hypothesis	$\lambda_{\max} = -T\log(1-\hat{\lambda}_j)$	$\lambda_{trace} = -T\sum_{j=r+1}^{p}\log(1-\hat{\lambda}_j)$	95% critical value for maximum value test	95% critical value for trace test
GDP-	$r=0$	15.379*	21.536*	14.880	17.860
RGX**	$r\le 1$	6.156	6.156	8.070	8.070
OGDP	$r=0$	12.207	19.926*	14.880`	17.860
RGX**	$r\le 1$	7.719	7.719	8.070	8.070
GDP	$r=0$	15.381*	21.538*	14.880	17.860
RGG**	$r\le 1$	6.156	6.156	8.070	8.070

** Eigenvalues in descending order are: 0.40109 0.1855

** Eigenvalues in descending order are: 0.3343. 0.2268

** Eigenvalues in descending order are: 0.40109 0.1855

* Significant at 95% critical value

$$\Delta ogdp_t = \delta_0 + \sum_{i=1}^{m}\delta_i \Delta ogdp_{t-i} + \sum_{j=1}^{n}\delta_j \Delta rgx_{t-j} + \mu_t \qquad (13\text{-b})$$

In all cases, we are dealing with the natural logarithm of the real terms.

Table (4) reports the causality tests applied on the three versions of the model.

As can be seen from table (4), we reject the two parts of the null hypothesis for the three versions of the model at 90% level of significance. The rejection of the null hypothesis allows us to accept the alternative hypothesis which means accepting the existence of bi-directional causality between the variables included in the three versions. The bi-directional causality between government spending and economic growth in the Saudi economy can be explained as follows: since the Saudi private sector is still on its way for development, the public sector is still functioning as the main provider for many goods and services i.e. (education, health, transportation, …). Therefore, if the economic growth increases, government expenditure will also increase as the government becomes more able to spend. By the same token, if the government expenditure increases, the aggregate demand will increase and hence the economic growth will also increase.

The bi-directional causality between oil GDP and government expenditure can be explained as follows: since the government of Saudi Arabia fully controls the oil sectors, an increase in oil GDP will increase government revenues which will enable the government to spend more. In addition, since the government is the main sector responsible for developing the oil sector, the increase in government ability to spend will increase government expenditure on oil sector which will enhance the oil GDP.

Finally, we can restate our finding as follows: if we use F-statistics at 90% level of significance, the causality is bi-directional and does not support the Keynesian approach nor go with the Wagner's findings.

V. Concluding Remarks

The relation between government spending and real GDP and real oil GDP is empirically tested using Saudi Arabia annual data for the period 1969 – 2000. Our model consists of three versions. Before conducting our tests, we first employed unit root test of Dickey and Fuller to look at time series properties in order to avoid getting spurious regression. Second, we conducted our cointegration and causality tests utilizing Johansen method and Granger causality approach, respectively. As indicated by our results, we accepted at 90% level of significance the existence of bi-directional causality between real GDP and real government spending, between real GDP and ratio of real government spending to real GDP, and between real oil GDP and real government spending. These findings indicate that the case of Saudi Arabia does not support Wagner's Law which states that there exists unidirectional causality going from national income to public expenditure.

Table (4): Granger Causality Test for the Three Versions.

Version of Wagner's Law	Null hypothesis	F- Statistics	Probability
1	Δgdp does not Granger cause Δrgx *	8.18815	0.00195
	Δrgx does not Granger cause Δgdp * *	3.06700	0.06514
2	Δgdp does not Granger cause Δrgg *	7.63112	0.00272
	Δrgg does not Granger cause Δgdp * *	3.06700	0.06514
3	$\Delta ogdp$ does not Granger cause Δrgx *	4.35201	0.02440
	Δrgx does not Granger cause $\Delta ogdp$ *	5.66418	0.00966

* (* *) significant at 95% (90%) level of significance.

Moreover, our conclusions do not go with the Keynesian proposition according to which government spending causes economic growth not vice versa.

The implications of our conclusions are significant. The policy makers should realize the direction of causality between government expenditure and economic growth. For the case of Saudi Arabia, their exists bi-directional causality between real GDP and real government expenditure. Therefore, government spending should be considered as an important instrumental tool when designing fiscal policy. However, these findings should not discourage the government momentum toward enlarging the participation of private sector in the Saudi economy. The privatization strategy should be applied at faster rates in order to reduce budget deficit, augment utilization of economic resources, and enlarge economic efficiency. Finally, since we found bi-directional causality between real government spending and real oil GDP, government spending should be aimed at oil sector which is fully controlled by the government.

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اختبار العلاقة بين الإنفاق الحكومي والنمو الاقتصادي في المملكة العربية السعودية

*مفرج الحقباني**

ملخــص

تسعى هذه الورقة إلى اختبار العلاقة بين الإنفاق الحكومي والنمو الاقتصادي في المملكة العربية السعودية باستخدام طريقة التكامل المشترك خلال الفترة من ١٩٦٩ إلى ٢٠٠٠م. ولقد توصلت الورقة إلى إثبات وجود علاقة مستقرة في الأجل الطويل بين الناتج القومي الحقيقي كمقياس للنمو الاقتصادي والإنفاق الحكومي الحقيقي. كما توصلت الورقة إلى وجود علاقة سببية في اتجاهين بين الإنفاق الحكومي والنمو الاقتصادي وبين الناتج المحلي الإجمالي النفطي والإنفاق الحكومي في المملكة العربية السعودية.

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