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Wagner's Law and the Expanding Public Sector in Saudi Arabia

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Abstract. The growth of public sector spending has been a subject of extensive theoretical and empirical investigation. One of the theoretical explanations that have been advanced is Wagner's Law which has been used to analysis the relationship between aggregate income and public expenditure. Thus, studies on this subject have been conducted for the validity of this law in the cases of developed and less developed countries. The validity of Wagner's Law in the case of Saudi Arabia is tested using aggregated and disaggregated public expenditure data for the period 1964-1998. The methodology employed is that of cointgration and the related error correction models. Results reported here suggest the existence of Wagner's Law in the case of Saudi Arabia. These results are in agreement with the findings of recent studies by researchers interested in this subject.

Introduction

The existence of a possible long run equilibrium relationship between national income and public expenditure growth has been an enduring subject of analysis. Although there are varying interpretations of this phenomena the basic idea is that the relative size of the public sector in the economy expands as national income increases.

In late 1800's the German economist Wagner formulated his famous law in which he observed, on the basis of historical evidence for several industrialized countries, that there is a long run tendency for government expenditure to rise as per capita income increases (see, Gandhi[1]; Wagner and Weber[2]; Mann[3]; Cameron[4]; Buchanan and Tullock[5]; Abizadeh and Gray[6]; North and Wallis[7] and Mann and Schulthess[8]). This observation led to the so called Wagner's Law or Hypothesis, which is assumed to be a proposition about long run relation between economic growth and the rise in government expenditure. Thus, according to this hypothesis increased government activity and the corresponding increase in government expenditure is an inevitable result of economic growth. According to Wagner several reasons contribute to the increased size of the public sector relative to a country's level of economic development. First, the greater division of labor and urbanization accompanying industrialization and development would require expenditures on contractual

enforcement and regulatory activity. Second, the growth of real income would facilitate the relative expansion of income elastic cultural and welfare expenditures. Third, economic development and changes in technology and the funding for long tem investments would have a dynamic impact on the level of fiscal activities of the state (see, Kelley[9]; Birdsall[10]; Payne and Ewing[11] and Cheng and Lai [12]). Moreover, Peacock and Wiseman [13, 14] attribute what they call 'Law of Increasing Government Activity' to the response of government to the subjective preferences of citizens and that the growth in prosperity in industrializing countries meant that 'basic' material needs were becoming widely satisfied and that government services would enter the preference functions of citizens. They point out that the income elasticity of demand for government services would, therefore, tend to become positive and greater than that for private goods. They indicate also that objective factors such as population growth and technological change might affect government expenditure growth, once it was accepted that a particular service was to be instituted.

On the other hand Musgrave and Musgrave [15] believe that there is complementarity instead of substitution at the margin between public and private goods associated with growing income per capita. They suggest that the changing technology associated with industrial growth requires complementarity inputs of secondary and higher education and of transport systems such as railways and highways. They assume that these complementary inputs generate external benefits which require public finance, because otherwise they would not be captured for the community. Thus, given the above reasons Wagner's hypothesis would indicate that increased government activity and the corresponding increase in government expenditure is an inevitable result of economic growth due to: (a) increased friction in society causing greater demand for government services, (b) as the society is growing richer, it requires the government to provide quality goods and services, and (c) the demand for such goods and services is highly income elastic. Wagner also felt that the lack of access to capital funds on a very large scale would produce state intervention in the long run as private sector firms would not be able to raise the required capital. Furthermore, the need for public infrastructure as a complement to private sector investment activities would be needed. However, this tendency that government expenditure increases with the rise in income, implies that there is a limit to which government expenditure can be controlled, and this must therefore be a concern for policymakers.

For Saudi Arabia, the government size has increased dramatically in absolute and relative terms since 1973. Government expenditure increased from less than 8 billion Saudi Riyal (SR) in 1970 to more than 200 billion in 1998. The highest level of government spending was more than 348 billion SR in 1980. Furthermore, government employment increased during this period of time from 137,968 in 1970 to 817,700 in 1995 employees and by 1998 it employs more than one

million employees at an annual rate of about 9.7%. This has been the direct consequence of increasing government involvement in economic activities and government's overall development strategy, under which many of the economic and social services are provided to the public by the government with less than their real cost. Moreover, according to Krimly [16] the official 1992 census counted 12.3 million Saudi Arabian citizens compared to the 1974 estimate of 5.3 million. This suggests an average growth rate of 4.2 percent per year, one of the highest in the world. Another factor affecting government expenditure is the rate of urbanization. This indicator according to the United Nations 'population studies' jumped from 16 percent of the total population in 1950 to 49 percent in 1970 and 80 percent in 1990. Besides that, the Saudi Arabian population is very young. According to 1992 census figures, half of the population is under the age of 15. The total number of secondary school students, for example, jumped from 600,000 in 1970 to 3.5 million students in 1992. Average annual growth rates in the number of students fluctuated between 12.5 percent in 1970-74, to 8.2 percent between 1975-79, 8 percent between 1980-84, 6.7 percent between 1985-89, and 5.6 percent between 1990-1994.

In the mean time, the number of university students leaped from 8,000 in 1970 to 170,000 in 1994, with annual average growth rate of 13 percent . As for university graduates in a given year, their number increased from 808 in 1970, to 5,124 in 1979, to 12,812 in 1984, and reached 18, 176 in 1991. The average annual growth rate for number of university graduates per year during the period 1970-1991 was 15.8 percent. University graduates during 1985-1989 totaled 59,100, while their total in the following five years, that is 1990-1994, reached more than 90,000. During the period between 1995-1999, about 166,000 students would have been graduated from the universities, thus enlarging the growing pool of employment seekers. These figures indicate that the number of university graduates during the 1990's exceeds the cumulative total of university graduates during the previous four decades by 83 percent. Consequently, this demographic explosion in Saudi Arabia represents a serious challenge in the critical area of employment opportunities in the government sector and will put high pressure on government expenditure. (For more information about these figures see Krimly [16]).

Moreover, even though the economic system in Saudi Arabia is based on the principle 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, the government has important influence on the economy through its expenditures financed mostly by revenues generated from oil. Oil revenues are the main sources of national income which is extracted and utilized by the government in the interest of the public. There is no private ownership of oil or oil concessions and revenues accruing from the

sale of oil go to the national treasury to finance government expenditures. It is mainly through these expenditures that the government gets the ability to play a large role and dominant influence on the performance of the economy. As El Mallakh [17] has pointed out: " It is indeed through government expenditures appropriations that one can see the greatest influence of the government on the levels of economic activities." Thus, the Saudi Arabian economy depends on oil as the source of income for the government, which uses it for domestic expenditure and the change in this source of income and in turn in government expenditure is expected directly and indirectly to affect the output of other sectors of the economy.

Furthermore, the government has played an important role during the past three decades in economic development in the country. In addition to providing infrastructure, establishing a modern educational system, and stabilizing the economy, the government has played influential role in establishing large companies and reducing various market distortions that would have worked against economic efficiency. To achieve complementarily and forward and backward linkages of different industries, the government adopted a policy of encouraging large companies – such as Saudi Arabian Basic Industries (SABIC)- to spearhead the drive of industrialization and development and by providing leading entrepreneurs with generous financial and technical support and assistance. The government also assisted with investment projects by providing direct and indirect assistance for construction of plants and facilities and helped directly to allocate financial resources by establishing quasi government financial institutions to assist the private sector in diversify-ing the economy. It is expected that because of the country's heavy dependence on oil as a source of revenue, the government's development strategy and the country's demographic structure, the expenditure obligations of the government will continue to grow over time, and with the fluctuations in international oil market, the deficit in the annual budget is likely to persist and may even increase.(For more information about the nature of the Saudi Arabian economy, see for example, El Mallakh[17]; Al Johany *et al.*[18]; Presley[19]; Askari[20]; Looney[21, 22], and Barry[23]).

Given the rapid increase in government expenditure in absolute and relative terms in Saudi Arabia during the period of study the aims of paper are two-fold. First, using annual data for Saudi Arabia for the period 1964-1998, to examine and investigate the properties of the individual variables and the order of integration of the data using the augmented Dickey Fuller (ADF) test, (Dickey and Fuller [24, 25] and the Phillps-Perron (PP) test, (Phillips[26]; Perron [27] and Phillips and Perron[28]). Second, given the significant implications that cointegration has for econometric analysis, the model pays particular attention to the problem of obtaining adequate representations of the nonstationary data. Thus, the hypothesis of long run relationship between government spending and income is tested using bivariate cointegrated system by employing the methodology of cointegration analysis as suggested by Johansen [29, 30] and Johansen and Juselius [31] to investigate the existence of Wagner's Law in the case of Saudi Arabia. Then the paper examines the

information content of the cointegrating relationship by examining the short run dynamics implied by the associated error correction model (ECM).

Literature Overview

The literature on Wagner's Law is immense to say the least. A number of studies, for various countries, have used time series data to test Wagner's proposition or hypothesis. Wagner and Weber [2] test the hypothesis for 34 countries over the period 1950-1972. Ram [32] covers the period 1950 to 1980 for 63 countries and expands the number to cover 115 countries [33] to find limited support to Wagner's hypothesis. Abizadeh and Gray [6] cover the period 1963 to 1979 for 55 countries and their results generally support the proposition for wealthier countries but not for the poorest countries. However, there are many country specific studies. For Canada, Wagner's Law has been studied by Gupta [34], Bird [35], Singh and Sahni [36], Ram [32, 33], Afxentiou and Serletis [37]. Mann [3], Nagarajan and Spears [38, 39], and Murthy [40] have found mixed results concerning the validity of Wagner's Law for Mexico. Ganti and Kolluri [41], Vatter and Walker [42] have studied the law for the United States, Kyzyzaniak [43] for Turkey, Pluta [44] for Taiwan, Gyles [45] for the United Kingdom and Burney and Al Mussallam [46] for Kuwait.

Eventhough Wagner's Law, the law of rising public expenditure, has been confirmed by several studies (see for example, Ganti and Kolluri[41] and Vatter and Walker[42] among others). However, there are some other studies which tend to show that Wagner's Law is not universal and does not apply at all times. Therefore, Beck [47] asserts that real public expenditure growth may have peaked in a number of developed countries, but he established a decline in the growth of real public expenditure in eight of the thirteen countries he studied. Pluta [44, 48] also established a similar result for some developing countries.

Though Wagner's Law is but one theory concerning the growth of government expenditure, this hypothesized relationship between the size of a country's public sector and the level of economic development has been intensely examined by researchers. For example, Peltzman [49] and Borcherding [50] provide surveys of various hypotheses concerning the growth of government. On the other hand, Afxentiou [51, 52] and Afxniou and Serletis [53] survey the role of the public sector in economic development and Gould [54] undertakes a comparative analysis of the sources of public expenditure growth in western industrialized countries. In general, researchers have been interested in the elasticity of government expenditure with respect to a country's level of economic development usually measured by GNP or GDP per capita. However, the approaches taken by researchers in examining Wagner's Law have varied. Thus, most researchers have examined the elasticity of various measures of government expenditure with respect to measures of income with the recognition of possible placement effects.

Empirical research on displacement effect include studies by Peacock and Wiesman [13, 14], Goffman and Mahar [55], Gupta [34], Bonin *et al* [56], Bird [35, 57], Rosenfeld [58], Tussing and Henning [59], Wiesman and Diamond [60], Andre and Delmore 61],

Nagarajan [62], Tiaw [63], Rowley and Tollison[64] and Nomura [65] among others. Other researchers have examined the temporal relationship between the size of the public sector and income utilization using time series techniques as Granger causality and cointegration tests (see for example, Oxley [66]; Park [67]; Payne and Ewing [11] and Kolluri *et al.* [68], among others).

In general the following studies find results in favor of Wagner's hypothesis, Enweze [69], Henning and Tussing [70], Krzyzaniak [43], Ganti and Kolluri [41], Vatter and Walker [42], Abizadeh and Yousefi [71,72], Abizadeh and Basilevsky [73], Yousefi and Abizadeh [74], Khan [75], Nagarajan and Spears [38], Gyles [45], Ram [76], Murthy [40,77], Lin [78], Nomura [65], Ahsan *et al.* [79], Park [67], and Payne and Ewing [11]. On the other hand, studies by Goffman and Mahar [55], Pryor [80], Diamond [81], Wagner and Weber [2], Pluta [44], Singh and Sahni [36], Sahni and Singh [82], Afxentiou and Serletis [37], Bairm [83], Courakis *et al.* [84], Henrekson [85], Ashworth [86], Hayo [87], Burney and Al Mussalam [46] and Hondoroyiannis and Papapertou [88] cast doubt on the validity of Wagner's hypothesis. However, studies by Mann [3], Pluta [48], Abizadeh and Gray [6], Ram [32, 33, 89, 90], Ansari *et.al.* [91], and Chletsos and Kollias [92] yield mixed results with respect to Wagner's hypothesis.

Methodology

The precise formulation of Wagner's Law or hypothesis is subject to some disagreement among researchers. However, it seems fair to say that it states that the level of economic development influences or causes the scale of government expenditure or the size of the public sector. It seems also that the core of Wagner's view is captured by the statement that relative size of the public sector tends to increase during the course of secular economic growth of a modern industrializing economy. Thus, the hypothesis is a statement about long run relationship between economic growth and relative size of the public sector. This has been indicated by Ram [76] that Wagner's hypothesis ' is not a proposition about a short run covariance and is certainly not a statement about a year to year covariance. Therefore, she points out that ' any empirical test of the hypothesis should cover a reasonably long period, and should consider the relationship for the entire period.'

In the economic literature there are different interpretations of the hypothesis which result into six formulations which are as follow:

$$GE=f(Y) \quad (1)$$
$$GC=f(Y) \quad (2)$$
$$GE=f(Y/N) \quad (3)$$
$$GE/Y=f(Y/N) \quad (4)$$
$$GE/N=f(Y/N) \quad (5)$$
$$GE/Y=f(Y) \quad (6)$$

where: GE is government expenditure, GC is government consumption, Y is income, N is

population. The first (1) formulation was employed by Peacock-Wiesman [13], Musgrave [97], and Goffman and Mahar [55]. The second (2) formulation was used by Pryor [80] in an effort to test specific statistical formulation of Wagner's Law. The third (3) was considered by Goffman [98] and Mann [3]. The fourth (4) was used by Musgrave [97], Ram [89] and Murthy [40]. The fifth (5) was considered by Gupta [34] and Michas [99] and the sixth (6) was used by Man [3].

With the exception of studies by Henrekson [85], Murthey [40, 77], Ashwarth [86], Hayo [87], Oxley [66], Lin [78], Honroyiannis and Papapetrou [88], Ahsan et.al [79], Park [67], Payne and Ewing [11], Ansari et.al [91], Chletsos and Kollias [92], Costomitis J. *et al.* [93], Biswal et.al [94], Thorton [95] and Kolluri et.al [86], most researchers have assumed that the respective time series are stationary and have proceeded to test Wagner's hypothesis with ordinary least square (OLS) regression of a measure of government expenditure on per capita income. However, if the time series follow a stochastic rather than a deterministic process the time series may contain a unit root and be non stationary in level. Thus, regression with non stationary series may produce spurious and nonsense relationships which will lead to misleading and erroneous conclusions (Ericsson [96]).

Several studies have examined time series variables properties and concluded that most macroeconomic time series data follow random walk. While Nelson and Plosser [100] documented that 14 major macroeconomic variables exhibit non stationary behavior over time, Hall [101] shows that the aggregate consumption follows a random walk process.

Time series studies, Granger [102], Granger and Newbold [103], Phillips [104], and Ohanian [105], have demonstrated that if time series variables are non stationary, all regression results with these series will differ from the conventional theory of regression with stationary series. That is, regression coefficients with non stationary series will be spurious and misleading. Therefore, analysis of the time series properties of variables used in macroeconomic research is particularly important when examining the relationship between variables that exhibit a common trend (Granger, [102]; Engle and Granger, [106]; and Johansen, [30]). Thus, to avoid spurious relationships and misleading results and to provide valid evidence to the Wagner's hypothesis, before proceeding to the cointegration analysis and the estimation of the long run relationship, the time series properties of the individual variables were examined by conducting stationarity or unit roots tests. A time series containing a unit root follows a random walk and requires first differencing to obtain stationarity, and it is said to be first order integrated, I(1). A variable that is stationary in level form is I(0). Researchers have developed several procedures to test for the order of integration. The most popular ones are augmented Dickey Fuller (ADF) test due to Dickey and Fuller [24, 25], and Phillips-Perron (PP) due to Phillips [26] and Phillips and Perron [28]. ADF test relies on rejecting a null hypothesis of unit root (the series are non stationary) in favor of the alternative hypothesis of stationarity:

$$\Delta xt - \mu + (\alpha - 1)Xt - 1 + \sum_{t=1}^{n} \gamma t \, \Delta xt - 1 + ut \qquad (7)$$

Where Xt is a random variable, Δ is first difference operator, ut is a stationary random error, t time period and n is number of lags for the dependent variable which is chosen to ensure that the residuals are white noise. The t-statistics of (α-1) is used to test the null hypothesis that this coefficient is equal to zero (i.e. that α =1). However, the critical values for the t-statistics does not have the familiar distribution. Thus, several authors have constructed appropriate critical values for the distribution of the t-statistics (i.e. Fuller, [107]; MacKinnon, [108]).

To determine the proper lags for each variable, the Akaike's final prediction error criterion (FPE) is used as suggested by Hsiao [109; 110]. A problem with the ADF test is that it involves the inclusion of extra differences terms in the testing equation which results in a loss of degrees of freedom and a resultant of reduction in the power of testing procedure. Alternatively, the Phillips Perron (PP) approach allows for the presence of unknown forms of autocorrelation and conditional heteroscedasticity in the error term. Perron [27] demonstrates that if a series is stationary about a linear trend but no allowance for this is made in the construction of the unit root test, then the probability of a type II error will be high. Thus, PP test corrects for serial correlation in equation (7) using a non parametric procedure. This procedure modifies the statistic after estimation in order to take into account the effect that autocorrelated errors will have on the results. Asymptotically, the statistic is corrected by the appropriate amount, and so the same limiting distribution applies. Perron [27] suggests estimating the following regression by ordinary least squares:

$$Xt = \mu+\lambda(t -T/2) +\delta Xt-1+ut \quad . (8)$$

While there are more than one method of conducting cointegration tests the empirical testing in this paper uses the multivariate cointegration method developed by Johansen [29; 30] and Johansen and Jueslius [31]. This approach is preferred to the Engle-Granger [106] method for several reasons. Engle-Granger procedure depends upon the normalization of the variables and may be sensitive to the choice of dependent and independent variables in the cointegrating equation. Thus, it is possible that the arbitrary choice of one variable as the dependent variable and the other as independent variable may lead to the conclusion that the variables are cointegrated, whereas reversing the choice of dependent and independent variables may indicate no cointegration. Further, because the Engle-Granger procedure relies on two step estimator in which the first step is to generate the residuals from the cointegration regression and the second step is to use the residual generated from step one to test for unit roots, any errors introduced in the first step also affects the second step. On the other hand Johansen-Jueslius approach provides a very flexible format for investigating the properties of the estimator under various assumptions about the underlying data generating process. Another advantage is that, unlike Engle-Granger cointegration methodology, the Johansen-Jueslius procedure is capable of determining the number of cointegrating vectors in the relationship. In the case of more than two variables , Banerjee *et al.* [111] and Cuthbertson *et al.* [112] have shown that Johansen-Jueslius procedure is preferred, and Phillips [26] has also indicated that this procedure has optimal properties in

terms of symmetry unbiasedness, and efficiency. Moreover, Gonzalo [113] compared the performance of the cointegration tests using a Monte Carlo study and found that Johansen-Jueslius procedure is the most powerful even for the bivariate system. He showed that Johansen-Jueslius approach has consistent estimates even if the errors are non Gausian and the dynamics are not known. The Johansen-Jueslius method applies the maximum likelihood procedure to determine the presence of cointegrating vectors in non stationary time series. Furthermore, Johansen and Jueslius provide two different tests, the trace test and the maximum eigenvalue tests, to determine the number of cointegrating vectors. The presence of a significant cointegration vector or vectors indicates a stable relationship between the relevant variables. Johansen [29] has shown that both tests will have non-standard distribution under the null hypothesis, even in large samples. While Johansen and Jueslius [31] provided appropriate critical values, Osterwald-Lenum [114] developed an extended version of these critical values.

As outlined in Ashworth [86], Murthy [40], Oxley [66], Hondroyiannis and Papapetrou [88] and Thornton [95] among others the Johansen-Jueslius approach to testing for cointegration considers a p-dimensional vector autoregression (VAR) model:

$$X_t = \Pi 1\ Xt\text{-}1 + ...+\Pi k\ Xt\text{-}k + \varepsilon t \qquad t= 1, ..., T \qquad (9)$$

This autoregressive model may be written as a conventional error correction model as follows:

$$\Delta Xt = \mu+\Sigma\Gamma t\Delta Xt\text{-}1 + \Pi kXt\text{-}k + \varepsilon t \qquad (10)$$

where: $\Gamma = -I +\Pi 1+ ..... +\Pi t$

$\Pi = I - \Pi 1 - ..... -\Pi k$

The Π matrix contains information about the long run relationships between the variables. Let the rank of the Π matrix be denoted by r. When $0< r < p$, the Π matrix may be factored into $\alpha\beta'$, where α may be interpreted as a p x r matrix of error correction parameters and β as a p x r matrix of cointegrating vectors. The vectors of constants, μ, allow for the possibility of deterministic drift in the data series. Maximum likelihood for α, β and Γt are derived in Johansen [29]. To test the hypothesis that there are at most r cointegrating vectors, one calculates the trace statistic (λtrace). The maximum eigenvalues test (λmax) is based on the null hypothesis that the number of cointegrating vectors is r against the alternative of r+1 cointegrating vectors. Johansen and Jueslius [31] provide critical values for λtrace and λmax statistics.

Data and Empirical Results

This study uses annual data covering the period 1964-1998. All variables are in real log terms. Even though conventional wisdom suggests that more observations are better,

because more observations allow us of better discrimination among hypotheses. However, Hakkio and Rush [115] suggest that conventional wisdom needs to be taken with care. In their view and as suggested by Ram [76], cointegration is a long run concept and hence requires long span of data, thus there is little gain from increasing observations using higher frequency with the same time span, but there is a gain from using the same frequency data with a longer time span. Moreover, Shiller and Perron [116] argue forcibly that, particularly when analyzing the long run characteristics of economic time series, the length of the time series is far more important than the frequency of observation.

Although real Gross National Product (GNP) is a good indicator of the overall level of economic development and activity in any economy, it in fact could be argued that, for Saudi Arabia , this variable does not accurately reflect the level of economic activity within the economy. This is attributed to the country's reduced ability to influence the oil production level and the price of oil in international market. With the extraction and export of oil being the dominant component of GDP and government revenue, a large part of the economic activity within the country is determined outside its system and has very little control over it. Moreover, as Saudi Arabia is an oil based economy, in which most economic activities are linked to oil, it is generally believed that this basic and important characteristic has a bearing on every aspect of economic activity. While, during the last two decades, the significance of oil in the economy has declined, it remains the dominant sector. Thus, non oil GDP (Y) represents income and the data on this variable and government expenditures (GE) and its components-government consumption (GC), government investment (GI) and government services (GS)-are taken from the Ministry of Planning 'Facts and Figures' different issues. Data on population (POP) are obtained from Central Department of Statistics reports.

Table 1 shows the results of augmented Dickey-fuller (ADF) and Phillips Perron (PP) stationarity test. These results show that the variables are non stationary in levels, but they become stationary when differenced, they are I(1). Table 2 presents the results of Johansen-Jueslius tests and the results indicate that the aggregate of GE has only one cointegrating vector. However, when equation (4) which was formulated by Musgrave [97] is used the variables are integrated with two vectors. Moreover, when GE is disaggregated into its components- government consumption (GC), government investment (GI), and government services (GS)- these variables become cointegrated with Y and have two vectors of contegration. These results suggest that a long run relationship between government expenditure or its disaggregated components and GDP (Y) exists. Given the cointegration results in Table 2 the error correction model (ECM) is formulated. Table 3 presents the results on error correction tests (ECt-1) which are significant and indicate the speed of adjustment to the long run equilibrium and also show the direction of causality which runs from GDP (Y) to government expenditure and each one of its disaggregated components. These results support the validity of Wagner's hypothesis in the case of Saudi Arabia and are in agreement with the findings of recent studies by Murthy [40, 77], Lin [78], Numura [65], Ahsan *et.al* [79], Payne and Ewing [11], Park [67], Thornton [95], and Kolluri *et al.* [68] among others.

Table 1. Unit roots tests

Variables	ADF		PP	
	Levels	Differenced	Levels	Differenced
Y	-1.486	-5.262 *	-1.814	-6.388*
GE	-1.352	-3.960*	-1.660	-3.501**
GC	-3.391**	-2.832**	-3.45**	-4.779*
GI	-2.001	-3.730*	-2.482	-3.799*
GS	-2.694	-3.916*	-2.910	-5.715*
POP	-2.667	-3.277*	-3.61	-4.631*

* Significant at 1% level,
** Significant at 5% level.

Table 2. Cointegration tests

Egenvalues	λmax	λtrace	5% for λmax	5% for λtrace	Hypothesis
			lnGE = f (lnY)		
0.425	18.263*	20.811*	14.07	18.17	r≤ 0
0.0743	2.548	2.548	3.74	3.74	r≤ 1
			lnGC= f (lnY)		
0.325	12.96**	22.305*	14.07	19.96	r≤ 0
0.2467	9.349*	9.349*	9.24	9.24	r≤ 1
			lnGI= f (lnY)		
0.2772	10.710*	14.039*	10.5	12.53	r≤ 0
0.096	3.329**	3.329**	3.84	3.84	r≤ 1
			lnGS = f (lnY)		
0.3292	13.178**	22.68*	14.07	19.96	r≤ 0
0.2502	9.502*	9.502*	9.24	9.24	r≤ 1
			lnGY= f (ln PY)		
0.3093	12.21**	16.571*	14.07	15.41	r≤ 0
0.1238	4.361*	4.361*	3.76	3.76	r≤ 1
			lnPE= f (ln PY)		
0.348	14.114*	18.370*	14.07	15.41	r≤ 0
0.121	4.2556*	4.556*	3.76	3.76	r≤ 1

* Significant at the 5% level,
** Significant at the 10% level.
GY = the ratio of real government expenditure to log of total GDP,
PY = the ratio of total real GDP to populaion (per capita GDP)
PE = the ratio of real government expenditure to population (per capita GE)

Table 3. Vector error correction (VEC) results

lnGC=f (lnY)

VAR model coefficients:

ΔlnGC= -0.633 -0.258lnGCt-1 -0.733Yt-1 -0.312ΔlnGCt-1 + 0.0574ΔlnGCt-2 +2.290ΔlnYt-1
-0.737ΔlnYt-2

VEC:

ΔlnGC = -0.312ΔlnGCt-1 + 0.057ΔlnGCt-2 + 2.290ΔlnYt-1 - 0.737ΔlnYt-1 -0.258ECt-1
(-1.80)*** (0.334) (2.973) (-0.968) (-4.24)*

R=0.437, F=7.026*, Log Likelihood= 22.10, AIC=-1.069, SC=-0839

lnGS=f (lnY)

VAR model coefficients:

ΔlnGS = 5.412 -0.446lnGSt-1 - 1.750lnYt-1 + 0.075ΔlnGSt-1 + 0.181ΔlnGSt-2 + 1.181ΔlnYt-1
-0.881ΔlnYt-2

VEC:

ΔlnGS = 0.075ΔlnGSt-1 + 0.181ΔlnGSt-2 +1.181ΔlnYt-1 -0.881ΔlnYt-2 -0.446ECt-1
(0.395) (0.894) (1.175) (-0.731) (-2.599)*

R=0.09, F=1.72, Log Likelihood= 11.27, AIC= -0.392, SC= -0.163

LnGY=f (lnPY)

VAR model coefficients:

ΔlnGY= 3.869 +0.084T -0.484lnGYt-1 -0.167PYt-1 +0.633ΔlnGYt-1 -0.150ΔlnGYt-2
+1.476ΔlnPYt-1 -0.411ΔlnPYt-2

VCE:

ΔlnGY= -0.113 + 0.0025T +0.633ΔlnGYt-1 -0.150ΔlnGYt-2 + 1.476ΔlnPYt-1 -0.411ΔPYt-2
(-1.885) (0.881) (3.787)* (-0.800) (2.770)* (-0.737)
+0.484ECt-1
(-2.967)*

R=0.356, F=3.854**, Log Likelihood=34.205, AIC= -1.700, SC= -1.38

Conclusion and Policy Implications

This paper analyzed the relationship between Government expenditure and measures of economic development and growth (GDP) in Saudi Arabia, an oil exporting and developing economy. To determine the relationship a unit root, cointegration, and error correction testes were conducted. The results support the validity of Wagner's hypothese in the case of Saudi Arabia and that government expenditure is positively related to the level of income (GDP). Thus, government expenditure, especially government expenditure on: consumption (GC), investment (GI), and services (GS) have risen with the increase in income caused by the dramatic rise in oil prices and revenue in 1970's and early 1980's. The increase in government expenditure continued even with the decline in oil prices and

revenues. This continuing increase in government expenditure forced it to run a huge deficit which started to accumulate since 1984 after it used its reserves between 1982 and 1988. After 1988 it resorted to financing this deficit by borrowing from domestic market. It can be argued that government consumption and services in Saudi Arabia continued to increase even with the decline in oil revenues available to the government. This can be attributed to the fact that the government assumed full responsibility of free education, health and welfare during the boom time and these services became institutionalized. Thus, the reasons offered by Wagner for increasing public sector expenditure apply to the Saudi Arabian case. These reasons [35]: (1) the administrative and productive functions of the state would substitute public to private activity. (2) economic development would lead to an increase in cultural and welfare expenditures. And (3) government intervention would be required to mange and finance natural monopolies. Therefore government activities in Saudi Arabia have grown, both in relative and absolute terms and there is a need for a privatization programs that reduce the government size and activities to an optimal one and get rid of the increasing budget deficit.

Moreover, the increase in population put heavy burden upon the government to continue supplying these services. This is so because as mentioned above oil receipts and revenues accrued directly to the government. This situation also created high expectation among the public about various services supplied by the government. Thus, even with the increase in deficit level, policy makers were forced to maintain high government expenditure level and to choose among priorities. This meant that various social sectors were less vulnerable to cuts than infrastructure projects, and administration which were subject to canceling or to future postponement. That is public spending on infrastructure was cut or reduced during periods of increased budget pressure to reduce budget deficit. The fact that social sectors [16] were relatively well protected suggests that there were high political costs associated with reducing them . Thus, it is easy to cut back public capital spending than other categories of public outlays since this can be done without societal resistance since the long term consequences of reducing government investment spending are not felt in the short run. Therefore, there are urgent needs to encourage the private sector to take active roles in economic activities. Privatization and increased private sector involvement can increase allocational efficiency and lead to smaller government size. This view is based on the assumption that private production is more efficient than public production, thus substitution from budget maximizing bureaucrats to profit maximizing firms is argued to increase allocational efficiency.

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قانون واجنر وتوسع القطاع العام في المملكة

عبدالله بن حمدان الباتل

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ملخص البحث. يعتبر نمو الإنفاق الحكومي وتوسع القطاع العام (الحكومي) موضوعا مهما، حيث إنه منذ نهاية الحرب العالمية الثانية ومحاولة حكومات الدول الصناعية التدخل في السياسات الاقتصادية ومراجعة القطاع الخاص على توفير بعض السلع والخدمات، بدأت الدراسات العميقة تبحث في هذه الظاهرة التي قال بها واجنر في نهاية القرن الثامن عشر. حيث ظهرت دراسات نظرية وإحصائية عددية لمعرفة مدى انطباق هذه الظاهرة على الدول الصناعية خلال الخمسة عقود الماضية، كما ظهرت دراسات أخرى حديثة تحاول دراسة هـذه الظاهرة في الدول النامية.

تحاول هذه الدراسة تحاول التحقق من مدى انطباق هذه الظاهرة على حالة المملكة وخصوصا بعد ارتفاع أسعار البترول وزيادة الإيرادات والإنفاق الحكومي منذ بداية السبعينات الميلادية مما أدى إلى تدخل الحكومة في قطاعات اقتصادية كثيرة لم يكن القطاع الخاص مهيأ للقيام بها أو بمشاركة القطاع الخاص. وتدل النتائج الإحصائية على وجود هذه الظاهرة في حالة المملكة، حيث إن النمو الاقتصادي أدى إلى تضخم وتوسع القطاع الحكومي بشكل كبير. وهذا بدوره يؤكد ما تثبته الدراسات السابقة التي قام بها بعض البـاحثين في حالات أخرى مشابهة.