Government Expenditures and Economic Growth in Jordan: An Empirical Investigation

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Abstract
This study examines the impact of various government expenditures' measures on the economic growth in Jordan during the period 1968-1993. A standard aggregate production function approach was utilized for this purpose. The time series' properties of the variables involved were evaluated using the latest econometrical techniques and Granger Causality Test which was conducted to insure the validity of the results. The statistical results indicate that the overall impact of government expenditures on economic growth is positive. A 10% increase in the growth of total government expenditures, both the size of growth of government expenditures relative to the size of the economy, and the growth of government consumption increase the overall economic growth by 2.73%, 5.39%, and 2.73% respectively.

1. Introduction
Adam Smith, the founder of modern economics argued that the best route to economic growth is through free markets. This argument was debated by many leading economists, such as: Kuznets, Lewis, Shultz, Myrdal, and Friedman. Whatever their debate concluded, since the Great Economic Depression of 1929, the Depression that came into being after the termination of the World War II, due to the needs and requirements of rapid economic development, most, if not all, developing countries have been resorting to the Keynesian prescription of enlarging and extending the role of governments in managing their economies through the activation of monetary and fiscal policies and other types of regulation. The increase in the role of governments in the economies of developing countries is traditionally justified in terms of requirements of economic development which are constrained by the lack of the proper development of economic and social infrastructure. Therefore, enormous government expenditures in these countries are incurred to achieve provision of economic and social infrastructure, correcting for market failures and regulating harmful private activities. The effect of such expenditures on economic growth could be positive, negative, or even neutral and this is considered a matter of empirical verification.

Consequently, the purpose of this study is to examine empirically, the effect of "government size" measured by the growth of government expenditures relative to the size of the economy measured by GDP, and the growth of government expenditures on economic growth in Jordan throughout the period 1968-1993 using the supply side economy.

2. Literature Review
The role of government size in economic growth has been controversial. Neither the theoretical arguments nor the empirical evidence are clear-cut or conclusive, especially in the less developed countries. Theoretically, relevant literature has been of diverse nature. On one hand, some economists have conclude that the role of the government has favorable impacts on economic efficiency and growth, and a larger government size is likely to be a more powerful engine for economic development and growth. This argument is based on: (i) the role of government in securing productive investment and providing a socially optimal direction for economic growth, (ii) harmonizing conflicts between social and private interests, and (iii) preventing foreign nations from exploiting the country (see, e.g., Samuelson, 1945; Peacock, 1963; Krueger, 1985; Kuznets, 1988; Reynolds, 1983, p.976). On the other hand, some have argued that a large government size could be
for the following reasons:- (i) regulation and its process imposes excessive costs and burdens on the economy (ii) in many cases, government's monetary and fiscal policies distort the activities of economic agents, and (iii) governments are often found to be inefficient in their economic operations (see e.g., Tullock, 1970; Stigler, 1975; Friedman, 1962; Balassa, 1982; Lal, 1983).

Empirically, the number of studies which have examined the impact of government expenditures on economic growth are very limited (Landau, 1986, p.35) and fairly recent.(1) Among the most notable studies are those of Robinson (1977); Landau (1983); Gemmell (1983); Mardson (1983); Landau (1985); Landau (1986); Ram (1986) and Setter (1993). These studies are usually of two types. The first type is a cross-country study which examines the extent to which government expenditures or size differences may explain intercountry economic growth differentials and whether the government expenditures or size have a significant impact on economic growth for a group of countries (see e.g., Robinson, 1977; Gemmell, 1983; Mardson, 1983; Landau, 1983, 1985, 1986). Such studies use different regression formulations to provide only average estimates of the coefficients which vary greatly amongst countries with diverse economic, political and social structures.

There is a number of problems related to cross-country studies. For example, these studies implicitly assume that the parameters are similar across the countries. In the production function context, different countries are assumed to operate with identical production functions. More of these problems are discussed by Chenery and others (Chenery, 1970). These problems need to be considered when interpreting the estimated parameters. It is preferable to consider the estimates as averages which provide a general order of magnitude within the sample of countries, but are not applicable to any country in specific (Feder, 1982, p.16).

The second type of studies is time-series studies which concentrate on the contribution of government size on economic growth for individual nations (Ram, 1986; Satter 1993). These types of studies have the following advantages:

a) They provide the researcher with the opportunity to take into account the peculiarities of each country in its own regression (2), that is to say, the assumption of homogeneity across the countries is no longer needed and the differences among countries can be accounted for; b) the estimates of the growth model for each country could be taken as a guide for policy formulation for that country; and c) they make the comparison among countries possible. Consequently, the two time-series studies of Ram and Satter use a formal growth model which has a better theoretical foundation in comparison with the multiple regression approach used in most cross-country analysis. Furthermore, in cross-country studies, the inclusions of explanatory variables in the regressions were based on a priori plausible influence of these variables on economic growth and were not guided by a theory (Landau, 1986, p. 38). Given the disadvantages of cross-sectional studies mentioned above, this study seeks to test the effect of government expenditures and government size on economic growth entirely on the basis of time-series data in Jordan alone and not as a part of another group of countries.

The findings of the empirical work turned out to be of mixed results. In general, all cross-country studies have concluded that government size measured in different ways (3), had either a negative effect or had no relation to economic growth for both LDCs and developed countries (see, Gemmell, 1983; Mardson, 1983; Landau, 1983, 1985, 1986) except the study of Robinson which concluded that a larger government size, indexed by the share of government revenue in GNP, promotes economic growth, specially in less developed countries.

On the other hand, the time-series studies concluded that the overall impact of government size on growth is positive in most countries studied (Ram, 1986; Satter, 1993). Satter results of time-series analysis covering the period of 1950-1985 for 31 low-income countries found that the impact of government expenditures and government size on growth on economic growth to be either negative or of no relation almost 20% of
these countries (Satter, 1993, p. 37). Ram in his
evidence from time-series data covering the period
of 1960-1985 for a group of 115 countries (mostly
developing countries) found that the estimated
coefficient of government expenditures growth is
positive in 100 of the 115 countries, and the
coefficient of the government size is positive in
98 countries; only 55% to 60% of the positive
coefficients for both variables are statistically
significant (Ram, 1986, p.199). Unfortunately, in
Jordan (to the best of the researcher's knowledge)
there is only one published study that deals with
the issue directly. The study used a Keynesian
type model to find the multiplier effect of total
government expenditures on GNP for the period
1967-87. The main finding of the study was that
the multiplier effect of government expenditures
on GNP is positive, but weak (Momani, 1991,
p.56).

In the present study, an aggregate production
function approach relating output to labor, capital
and government expenditures is used. Furthermore,
in finding the overall impact of government size and government expenditures on
the growth of the economy, the analysis differs
from previous works in two important ways. First,
empirical evaluation of the time series properties
of the variables is involved. The testing procedures
are based on work by Engle and Granger (1987),
Perron (1988); and Charemza and Deadman (1993,
p.116-170). Secondly, the causal relationship
between the growth rates of government
expenditures and GDP is tested and is supplemented
with cointegration analysis. Thus, part of this paper
may be viewed as an application of a relatively
new time series' method to a research problem on
which there is a considerable disagreement in the
literature.

3. Specification of the Model

Following the lines of previous empirical work
explaining the sources of economic growth (e.g.,
Solow, 1956; Dension, 1967; Feder, 1982; Ram,
1986) (4), the standard aggregate production
function approach is used with some modification
in this study. This approach considers government
expenditures as an input, like labor and capital in
the aggregate production function, whose general
form may be written as:

\[ Y = \alpha_0 \cdot f(K, L, G) \]  

Where \( Y \) = the level of output, measured by real
GDP
\( K \) = capital stock;
\( L \) = Labour;
\( G \) = government input measured by real government
expenditures; and
\( A \) = a variable which measures factor productivity,
it is generally assumed to grow at a constant and
exogenous rate.

Differentiating equation (1) totally with
respect to time and dividing the result by \( Y \) yields
the following growth model:

\[
dY/Y = [A \cdot \partial Y/\partial K] dK/Y + [A \cdot \partial Y/\partial L] dL/Y + [A \cdot \partial Y/\partial G] G/Y + \alpha_3 dG + \alpha_2 A/L \]  

For the purpose of econometric estimation,
equation (2) can be rewritten as:

\[
\Delta Y/Y = \alpha_0 + \alpha_1 \Delta K/Y + \alpha_2 \Delta L/L + \alpha_3 \Delta G/G + \alpha_4 + \epsilon_1 \]  

Where SYMBOL 97 of "Symbol"SYMBOL 111 of
"Symbol" = \( dA/A \), is a constant term, assumed
to capture the growth in productivity;
\( \alpha_1 = A \cdot \partial Y/\partial K \), is the marginal productivity
of capital;
\( \alpha_2 = A \cdot \partial Y/\partial L \), is the elasticity of output with
respect to labor;
\( \alpha_3 = A \cdot \partial Y/\partial G \), is the elasticity of output with
respect to total government expenditures, and \( \alpha_4 \)
is an error term.

Equation (3) has been used in different forms
in most studies of growth process in less developed
countries. The standard two-factor model involving
labor and capital is obtained by setting \( \alpha_3 = 0 \) (see
Chenery et al., 1986). A simpler form of
equation (3), is sometimes used to obtain the
"incremental capital-output" by setting \( \alpha_2 = \alpha_3 = 0 \)
(see Chenery and Strout, 1966, p.698). A more
general form of equation (3) is used recently with
various determinants of growth in addition to labor
and capital. For example, some economists added
growth of exports as another determinant of economic growth on the ground that in many less developed countries, the growth of exports has led to the development of efficient and internationally competitive management. The introduction of improved production techniques, training of higher labor quality, and the development of infrastructure (see, e.g., Kessing, 1967; Balassa, 1978; and Ram, 1985). More recently, another group of economists justified the inclusion of government expenditures as an input in the production functions of less developed countries on the ground that the growth of government expenditures have led to the development of infrastructure, communications and transportation, and the provisions of public goods which can also be complementary to private investment. Government expenditures of this type can enhance the opportunities for private investment and raise the productivity of capital, augment overall resource availability by expanding aggregate output, and increase the demand for private production (see e.g., Ram, 1986; Barro, 1990; King and Rebelo, 1990). These researchers, also have emphasized the importance of distinguishing between productive (i.e. education) and non-productive spending (i.e., government consumption). However, they agree that total government expenditures can be complementary to the private sector in promoting economic growth. For this reason, in this study, one will test for both the impact of total government expenditures and government consumption expenditures on economic growth by using the growth of total government expenditures and the growth of government consumption expenditures interchangeably in equation (3).

Furthermore, to test for the overall impact of government size on economic growth, one can manipulate equation (3) by letting
\[ \alpha_3 = \alpha_3.3.G/Y \],
thus, \( \alpha_3 = \alpha_3.3.G/Y \), we get:
\[ \Delta Y/Y = \alpha_0 + \alpha_1 \Delta K/Y + \alpha_2 \Delta L/L + \alpha_3 (G/Y) \Delta (G/G) \]
+ U_{2} \hspace{5cm} (4)\]
where \( \alpha_3 \), measures the overall impact of government size on the growth of GDP because the variable \( (G/Y) \Delta (G/G) \) measures the growth of government expenditures relative to the size of the economy measured by GDP, while \( \alpha_1 \) in equation (3) measures the impact of government expenditures growth on the growth of GDP. The difference between equation (3) and (4) lies in the measurement of the government variable. The coefficient of \( \Delta G/G \) in equation (3) gives an estimate of the impact of the growth of government expenditures on the growth of GDP, while the coefficient of the variable \( (G/Y) \Delta (G/G) \) gives an estimate of the impact of the government size measured by the growth of government expenditures weighted by it's share in GDP. Therefore, it is not true to say that an increase in the relative size of the government will necessarily lead to an increase in the growth of government expenditures or visa verse (see for example, Ram, 1986, p.192-193 and Satter, 1993, p.33-34).

4. DATA
The basic data needed to estimate the above mentioned models were gathered from different sources. Nominal total government expenditures, government consumption expenditures and GDP, are taken from the International Financial Statistic Yearbook. Real values of these variables were calculated as the nominal values divided by the implicit GDP deflator. The base year is taken to be 1990. Capital stock was estimated as follows: the capital stock for 1968 was obtained by multiplying the incremental capital output ratio (5) by the real GDP for that year. Subsequent figures of the capital stock were derived by cumulating the real net capital formation which is by definition equal to real gross investment minus real depreciation (Adelman and Chenery, 1966). Employed labor force was calculated by subtracting the unemployed labor force (unemployment rate multiplied by the labor force) from the total labor force and used as proxy for the actual employment. Data used to calculate actual employment has been derived from the reports of the ministry of labor. All observations are annual ones for the period 1968-1993.
5. The Time Characteristics of Data And Causality Between Government Expenditures and Gross Domestic Product.

Empirical evidence shows that many economic series behave like stochastic rather than deterministic processes (see Nelson and Plosser, 1982; Meese and Singleton, 1982; and Perron, 1988). In the stochastic process, the series needs to be differenced d times [if it is integrated of order d, I(d)] to induce stationarity [integrated of degree zero l(0)], while the deterministic process is characterized as having a stationary component around a deterministic trend term. Econometric theory requires the variables to be stationary (integrated of degree zero) if inferences are to be non-spurious when using Ordinary Least Squares method (OLS), because the OLS estimators have sampling distribution with properties very different from those with nonstationary variables (Charemza and Deadman, 1993, p.124). Nonstationary variables if used in regression analysis, often lead to misleading results if they are not contigated. However, if the variables used in regression are integrated of degree one [I(1)] and a linear combination of them is stationary [I(0)], then the variables are said to be contigated and using the OLS yields valid results (see Granger, 1986, p.153; Phillips, 1987, p.285; and Gujarati, 1995, p.710).

5.1. Testing for The Stationariness of the Variables

There are three relationships that may be used to represent economic time series. These are random walk, random walk with a drift and trend stationary process. The three models can be written as follows:

\[
\Delta Z_t = \mu + \beta_T + (\rho - 1) Z_{t-1} + E_t \tag{5}
\]

Where, \( Z_t \) is a time-series variable,
\( \mu \) is a constant representing drift,
\( T \) is a trend,
\( Z_{t-1} \) is one period lag of \( Z_t \),
\( E_t \) is an errors term, and
\( \beta, \rho \) are parameters

This equation is used for the Dickey -Fuller (DF) unit root test\(^9\). If \( \rho \) is close to unity, then the coefficient, (SYMBOL 114 \( \text{"Symbol"-} \) 1), will not be significantly different from zero and there will be no unit root in the series \( Z_t \) and the series is said to be stationary in the level, or integrated of degree zero. If the series \( Z_t \) has a unit root, but differencing the series once makes it stationary, then it is said to be integrated of degree one. In addition to testing for stationariness, equation (5), can be used to establish if there is a deterministic trend (\( \beta \) does not equal zero) and a drift (\( \beta \) does not equal zero) in the series \( Z_t \). The error term, \( E_t \), should be white noise if \( Z_t \) is to be used in regressions that make sense. If the series \( Z_t \) is a first order autoregressive process \( \text{AR}(1) \), then the single lagged value of the dependent variable in equation (5) will be sufficient to insure this condition. If the process is not \( \text{AR} \) (1), then an additional difference terms of \( Z_t \) should be included in the left hand-side of equation (5) to make \( E_t \) white noise, so (5) can be written as follows:

\[
\Delta Z_t = \mu + \beta_T + (\rho - 1) Z_{t-1} + \sum_{j=1}^{N} \rho_j \Delta Z_{t-j} + E_t \tag{6}
\]

which is the equation for the augmented Dickey -Fuller (ADF) test. These two tests in equation (5) and (6) are regarded as the most efficient tests among the tests for integration and are widely used in practice\(^9\). Because the distribution is not the standard one, the critical \( t \) values for these tests, were calculated by many, most notably and recently, by Mackinnon (1991) for all sample sizes (Mackinnon, 1991). The two tests mentioned above were applied to the data set of all variables used in this study\(^9\). The tests applied to the variables in their rate of change. Application of the first test showed that all series appear to be of first order autoregressive processes, because the errors in equation (5) are white noise. Variables
deletion tests indicate that the additional lagged changes ($\Delta\rho_t AZ_{t+1}$) in equation (6) are not necessary. Thus, the Dickey-Fuller (DF) test of equation (5) is adequate. Also using equation (5) shows that the drift ($\mu$) and the trend ($\tau$) are not significant for all variables except for the rate of change of total government expenditures ($\Delta G/G$), where the drift is significant in the equation. So, basically, we used:

$$\Delta Z_t = (p-1) Z_{t+1} + \epsilon_t$$

for all variables, except for $\Delta G/G$, we used $\Delta Z_t = \mu + (p-1) Z_{t+1} + \epsilon_t$. The results are reported in Table 1.

Table 1 shows that the DF values are greater than the Mackinnon critical values in absolute terms for all variables (9). Therefore, we conclude that all variables are stationary(10) and are integrated of degree zero.

<table>
<thead>
<tr>
<th>Variable</th>
<th>DF</th>
<th>Values at 5%</th>
<th>Order of Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta Y/Y$</td>
<td>-2.66</td>
<td>-1.96</td>
<td>zero</td>
</tr>
<tr>
<td>$\Delta K/Y$</td>
<td>-2.10</td>
<td>-1.96</td>
<td>zero</td>
</tr>
<tr>
<td>$\Delta G/G$</td>
<td>-3.83</td>
<td>-2.99**</td>
<td>zero</td>
</tr>
<tr>
<td>$\Delta L/L$</td>
<td>-6.28</td>
<td>-1.96</td>
<td>zero</td>
</tr>
<tr>
<td>$(G/Y)(\Delta G/G)$</td>
<td>-3.36</td>
<td>-1.96</td>
<td>zero</td>
</tr>
<tr>
<td>$\Delta G/GC$</td>
<td>-3.88</td>
<td>-1.96</td>
<td>zero</td>
</tr>
</tbody>
</table>

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### 5.2. Granger Causality Test

Co-integration and integration analysis says nothing about the direction of causality between variables, but if two variables are found to be co-integrated, it follows that there must be Granger Causality in one direction or another. Granger's Causality Test regresses the current values of a variable $Y$ on lagged values of itself and lagged values of another variable $X$. If the lagged values of $X$ as a group are significant, it means that $X$ explains some of the variance of $Y$ that is not explained by lagged values of $X$. This indicates that $X$ is causally prior to $Y$ and is said to cause $Y$. Granger proposes the following model to test for causality between two variables (Granger, 1969, p. 431):

$$Y_t = \sum_{i=1}^{n} \alpha_i Y_{t-i} + \sum_{j=1}^{m} \beta_j X_{t-j} + \epsilon_t \tag{7}$$

$$X_t = \sum_{i=1}^{n} \sigma_i X_{t-i} + \sum_{j=1}^{m} \phi_j Y_{t-j} + \nu_t \tag{8}$$

Applying this model to our series by substituting $\Delta Y/Y$ and $\Delta G/G$ which are stationary in equations (3) and (4), the equations can thus be rewritten as:

$$\Delta Y/Y = \sum_{i=1}^{n} \alpha_i (\Delta Y/Y)_{t-i} + \sum_{i=1}^{m} \beta_i (\Delta G/G)_{t-i} + \epsilon_t \tag{9}$$

$$\Delta G/G = \sum_{i=1}^{n} \sigma_i (\Delta G/G)_{t-i} + \nu_t \tag{10}$$

For unidirectional causality from $\Delta G/G$ to $\Delta Y/Y$, the estimated coefficients on lagged $\Delta G/G$ in equation (9) should be significantly different from zero as a group and the set of estimated coefficient on lagged $\Delta Y/Y$ in equation (10) should be significantly different from zero. Bilateral causality is suggested when both the coefficients of lagged $\Delta G/G$ in (9) and the coefficient of lagged $\Delta Y/Y$ in (10) are significantly different from zero. Finally, independence is inferred when both sets of coefficients are not significantly different from zero.
Using our data set for both variables and using different lags structure (1, 2, 3, 4, and 5 lags) in equations (9) and (10), the results showed no lag structure is significant except for the first lag of SYMBOL 68 in Symbol/G/G in equation (9), the error is white noise and F test statistic is 3.41, which is significant at the 90% level. This result suggests that ΔY/Y is Granger caused by ΔG/G. Consequently, we can say that the rate of growth in real government expenditures lagged one year causes some of the changes in the growth rate of current Gross Domestic Product in Jordan. This result is in conflict with Wagner's formulation, i.e., the rates of government expenditures to Gross National Product should expand as economic growth proceeds (Wagner, 1958), which was widely used in the literature.

6. Estimation And Results

Having established that the variables to be used in equations (3) and (4) are stationary [I(0)] and ΔY/Y is Granger caused by ΔG/G, it is admissible to estimate both equations using OLS. Table 2 contains the results. The estimates are given for equation (3), (4) and a variant form of (3), that is when ΔG/G is replaced by ΔG/G/GC. This variant will be called (3') from now on.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Equation Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>(0.17)</td>
</tr>
<tr>
<td>ΔK/Y</td>
<td>0.223**</td>
</tr>
<tr>
<td></td>
<td>(4.35)</td>
</tr>
<tr>
<td>ΔL/L</td>
<td>0.222**</td>
</tr>
<tr>
<td></td>
<td>(3.62)</td>
</tr>
<tr>
<td>ΔG/G</td>
<td>0.273**</td>
</tr>
<tr>
<td></td>
<td>(3.03)</td>
</tr>
<tr>
<td>(G/Y)(ΔG/G)</td>
<td>—</td>
</tr>
<tr>
<td>ΔG/GC</td>
<td>0.237**</td>
</tr>
<tr>
<td></td>
<td>(2.78)</td>
</tr>
<tr>
<td>R2-Adjusted</td>
<td>0.72</td>
</tr>
<tr>
<td>F-Ratio</td>
<td>21.7</td>
</tr>
<tr>
<td>D.W. test</td>
<td>1.81</td>
</tr>
<tr>
<td>S.E.E</td>
<td>0.046</td>
</tr>
</tbody>
</table>

* T-values in parentheses below coefficient; and S.E.E. is the standard error of the estimated equation
** Significant at the 1% level
*** Significant at the 5% level.

Table 2 indicates the followings:

a) The "goodness of fit" measured by adjusted R2, appears to be satisfactory in all equations. The explanatory power of the three equations (72% for equation 3, 70% for equation 3', and 72% for equation 4) is somewhat larger than the previous time-series work (Ram, 1986; Satter, 1993). Serial correlation was not observed in all three equations. D.W. statistic allowed us to reject the hypothesis of serial correlation, at least, at the 10% significance level. The regression F-statistics are found to be highly significant for all equations. The above tests provide some confidence in the statistical significance of our regression coefficients.

b) The coefficients of all explanatory variables as expected, are positive and statistically significant at 1% and 5% levels. In particular, the growth of total government expenditures (ΔG/G), government size (G/Y)(ΔG/G), and the growth of government consumption (ΔG/G/GC) exhibits a positive impact on economic growth. A 10% increase in each of them augments economic growth by 2.73%, 5.39%, and 2.37% respectively.

c) The growth of actual employment (ΔL/L) has a positive and statistically significant coefficient, indicating that a 10% increase in this variable causes economic growth to increase by slightly over 2% in the three estimated equations. This result contradicts Satter result of insignificant (11) labor force coefficient for all of the 16 developing countries included in his sample (Satter, 1993).

d) The marginal productivity of capital [Coefficient of the capital accumulation variable(ΔK/Y)] is positive and significant. It indicates that an increase in the change in capital stock-income ratio of 10% will raise the growth rate of output by around 2.2% in the three estimated equations.

e) Results a, b, c, and d indicate that the...
government variables have the strongest impact on the growth of GDP. This could be explained by the hypothesis that governments in LDCs have a direct involvement in the development process through different forms of intervention and planning, which create a situation where a large portion of their expenditures goes for investment in physical and social infrastructure. Therefore, a strong link between government expenditures and growth is created. This will lead to what Diamond (1965) described as capital deepening, which in turn causes capital-labor ratio to increase (Diamond, 1965, p.1129).

In summary, the results in table 2 demonstrate that the growth model used in this study explain the growth rate of GDP reasonably well, and the government variables \( \Delta G/G \), \( \Delta GC/GC \), and \( G/Y \) \( \Delta G/G \) seem to have the most important effects. This suggests that, for Jordan, government intervention and control of the economy measured by the growth of government expenditures \( \Delta G/G \) \( G/Y \) variables have, on balance, generated a positive impact on economic growth in the period 1968-1993. Furthermore, the evidence presented in this study suggests that, overall, the effect of productive government expenditures has outweighed the productivity-reducing inefficiencies in Jordan for the period of the study.

7. Conclusion

...While there is no general agreement on the role of government intervention and control in economic growth, there has been no systematic testing of this issue for the Jordanian case. Clearly, in the absence of any rigorous and persuasive empirical evidence, it is very difficult to argue against or for the reduction of the or promotion of the public sector role in the economy. The objective of this paper was to develop a growth model that would allow different government variables to exert effects on output growth and apply fairly recent time-series methods to ensure the validity of the results.

The principle conclusion of this study is that the net impact of efficiency-enhancing roles of government (e.g. providing social and economic infrastructure) and its efficiency-reducing roles (e.g. quantitative and price controls) are positive. Government intervention measured in different ways [growth of total government expenditures \( \Delta G/G \), the growth of government expenditures relative to the size of the economy \( \Delta G/G \) \( G/Y \), and the growth of government consumption expenditures \( \Delta GC/GC \) ] have different effects on the rate of economic growth. Among these, the growth of government expenditures relative to the economy has the largest impact, while the least impact resulted from the growth of government consumption expenditures. Furthermore, and perhaps more relevant to the debate on the role of government in economic growth, all measures of government intervention play a larger and thus more important role in the growth process than the role of labor or capital accumulation variable. Therefore, one could say that there is some empirical support for the role of government expenditures in the economy and the privatization of government activities in Jordan need to be examined carefully.

This conclusion needs yet to be qualified. What results have revealed are only the direct effects of government expenditures on economic growth. It is possible that government expenditures have positive indirect effects on growth. As an example, if government and private investment are complementary, then the estimated effects of government expenditures are less than the total effects. By providing the necessary infrastructure (e.g. electricity, schools, and telecommunications), government investment expenditures can have a strong influence on the rate and productivity of the private investment. It is clear that in many developing countries, the reduction or elimination of government investment could have a negative impact on private activities and investments. Furthermore, some forms of government
expenditures, such as expenditures on human capital, can enhance productivity and indirectly contribute to economic growth. On the other hand, some of the indirect effect of government expenditures could, in principle, also be negative on the private sector via crowding-out effect. However, none of these indirect effects are investigated in this study. Capturing both the direct and indirect effects of government intervention on economic growth, gives a more realistic picture of the whole situation and would be an area for further studies.

Notes

1. From an extensive literature search I found out that the empirical studies dealing with issues started in the late seventies.

2. For example, including a dummy variable to account for the structural changes in the economy, such as wars ... etc.

3. For example, Rubinson (1977) measured government size by using an index of the share of government revenue in GNP, while Landau (1983, 1985, 1986) used different measures such as, government consumption expenditures excluding military and educational expenditures, military and transfer expenditures, educational expenditures, and development expenditures to assess the impact of different types of government expenditures on economic growth.

4. For more empirical work on using aggregate production function (see, e.g., Denison, 1962; Robinson, 1971; Augustin, 1990).

5. The 3.0 incremental capital-output ratio in Jordan was estimated by Japan International Cooperation Agency in 1980. This estimate was used to derive the capital stock in Jordan for the period under study. For more details of how capital stock is generated in the Jordanian case see Hammad (1986) and Bani-Hani and Shamia (1989).


7. For more details of these test procedures, see Charemza and Deadman, 1993.

8. The Micro TSP program version 7.1 were used to estimate all equations in this study.


10. All variables are stationary because the original variables have been differenced once to get the rate of change. This means that the original variables (e.g. GDP) were integrated of degree one I (1). As a matter of fact, the researcher performed the DF and ADF tests on all variables in their natural forms. The results revealed that all of them are I (1).

11. Satter’s results may be explained by the fact that population growth was used as a proxy for labor force growth, as it is extremely difficult to obtain a continuous time-series on labor force for many LDCs countries.

12. In all previous work in LDC’s the investment-output ratio was used, because long-time series data for the capital stock are not available for most countries.

النُطاق الحكومي والنفوذ الاقتصادي في الأردن، دراسة تحليلية قياسية

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ملخص

تبحث هذه الدراسة في الآثار المختلفة لأشكال اللفاق الحكومي على النمو الاقتصادي في الفترة من 1991-1999. يتم استخدام طريقة دالة الانحدار الكاملة وتطبيقها لقياس الدعم المتغير للمستقبل. هذه الدالة تستخدم لقياس دقة التنبؤات الاقتصادية والاستثمار، حيث يتم الانتقاد من خلال استخدام قاعدة (Granger) للتنبؤات الاقتصادية في إيجابية مترادف الشكل للتفاعلات. يشير النتائج الاقتصادية إلى إيجابية أثر التفاعلات، حيث إن زيادة قدرتها في أي من اللفاق الحكومي أو حجم الفعّاظ الحكومي أو الاستهلاك الحكومي...
References


