Causality Between Public Expenditure and GDP Growth In Palestine: An Econometric Analysis Of Wagner's Law

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Abstract

This study aimed to explore the causal relationship between public expenditure and the GDP growth in the Palestinian territories over the period of 1994-2013. For this purpose trends in both public expenditure and GDP growth in Palestine are discussed, the paper also explored the relevant literature regarding Wagner's Law and the recent related empirical studies in various countries of the world. The study has adopted recent advances of econometric techniques. For this purpose, stationarity properties of the data and the order of integration of the data are empirically investigated by the Augmented-Dickey Fuller (ADF) test in the first place. Hypothesis of a long-run relationship between public expenditure and GDP growth has been tested by Engle-Granger co-integration test. Depending on the co-integration results of the six versions of Wagner's Law, the findings reveal that there is a co-integration between public expenditure and GDP growth. Such results indicate that there is a long-run relationship between public expenditure and GDP growth for the Palestinian case. On the basis of the Granger causality tests, we also found that both public expenditure and GDP have a cause effect on each other, the findings also suggest that both public expenditure and GDP are growing substantially and hence validate Wagner's Law in the case of Palestine.

Kew Words: Public Expenditure, GDP Growth, Wagner's Law

1. Introduction

Since its establishment in 1994 the Palestinian National Authority had adopted the principal of market economy. Given the unique political and economical conditions of the Palestinian society, the Palestinian National Authority has no option but to keep its interference in the economy through various ways of spending activities. This increasing government activities came as an answer to the status of the economy which had inherited after the Israeli occupation to the West Bank and Gaza strip. Such conditions required a mass policy of public expenditure in order to restructure the destroyed economy which has been lifted by the Israelis, so expenditures were required in current terms as well as in developmental terms and ,therefore, government activities and consequently public expenditure had raised substantially.

Given both the domestic as well as the international circumstances, public expenditure in most countries has an inevitable trend of growth in the long run. Palestinian territories is one of those countries in which public expenditure has expanding over the past two decades to mark more than 50% of the real GDP, and has reached a high level of more than 70% of the real GDP in recent years. The relationship between public expenditure and economic growth is one of the most debatable issue in the literature of economic growth, the expansion of government expenditure has evoked the interest of both economist and political scientists.

As a result, several theories and hypothesis have been suggested in order to explain the growth of the state economy and a large number of empirical studies had focused on this issue. Most of the studies have focused on the different formulation of the state growth over time, these studies were applied across countries or group of countries (EU, OECD, LDCs, Developing Countries, Gulf Countries). The issue of public expenditure can be considered as an old issue of classical economies in which the growth of government expenditure has a significant negative impact on economic growth of a country and the stat activities are required to be kept on the least possible level. The economic thoughts regarding the relationship between public expenditure and the GDP growth present two opposite perceptions. The first one introduced by Wagner (1883) in which public expenditures are considered as endogenous to economic development, that means growth in the economy causes public sector expenditures to expand. While the second one which was introduced by Keynes (1936) states that the use of fiscal polices can boost economic activities i.e. expanding public expenditures increases economic growth.

According to Wagner's approach, causality runs from GDP growth to public expenditure, while according to Keynesian approach, causality runs from public expenditure to growth of GDP especially during the recession times. Wagner's and Keynesian modes are not the only models that explain the growth of public expenditure, there are some other models such as the displacement effect and the theory of bureaucracy. But the present study focuses on Wagner's model for the case of Palestine to analyze whether the data based on the period of 1994-2013 support Wagner's law of public expenditure or not.

2. Trends in Government Expenditure and GDP in Palestine

Public expenditure is considered as one of the important criteria to measure the size of the government activities in the economy as a whole. In order to reach a clear idea about the size and the growth level of public expenditure, it is necessary to compare such expenditure with the total economic activities which are usually presented by the gross domestic product (GDP). Figure (1) presents the trends and developments in gross public expenditure (GPEX) in Palestine during the period of 1994-2013.

Figure (1) developments of Gross Public Expenditure (1994-2013)
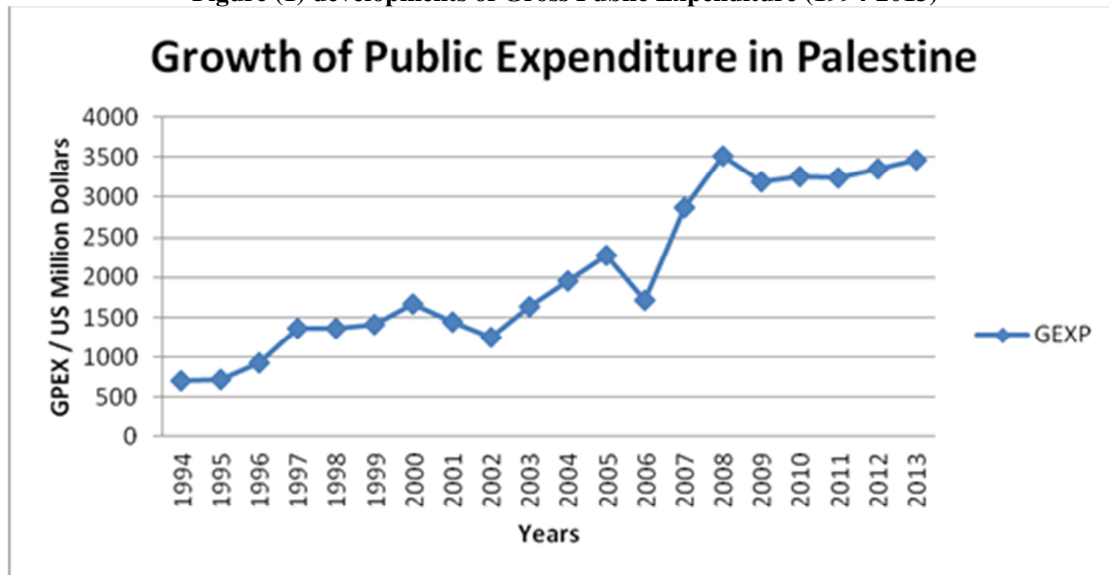
Since the beginning of the period (1994), public expenditure had experienced an increased trend in an overall basis, such rising expenditure has been subjected to bounce several times due to the political and economical factors that are surrounding the economic conditions in Palestine and also due to the developments of the on going political conflict in the region. Such trend cannot give accurate idea about the factors and conditions which would have caused such increase in the government spending over the years. Taking the Palestinian case into consideration regarding the newly established Palestinian National Authority and the mounting burden of political and economical and social factors, the government found it difficult to continue its activities without a substantial increase of its expenditure which are directed towards the aspects of political and economical life in Palestine.

Figure (2) shows the comparison between the growth of public expenditure and the growth of GDP in Palestine during the study period.

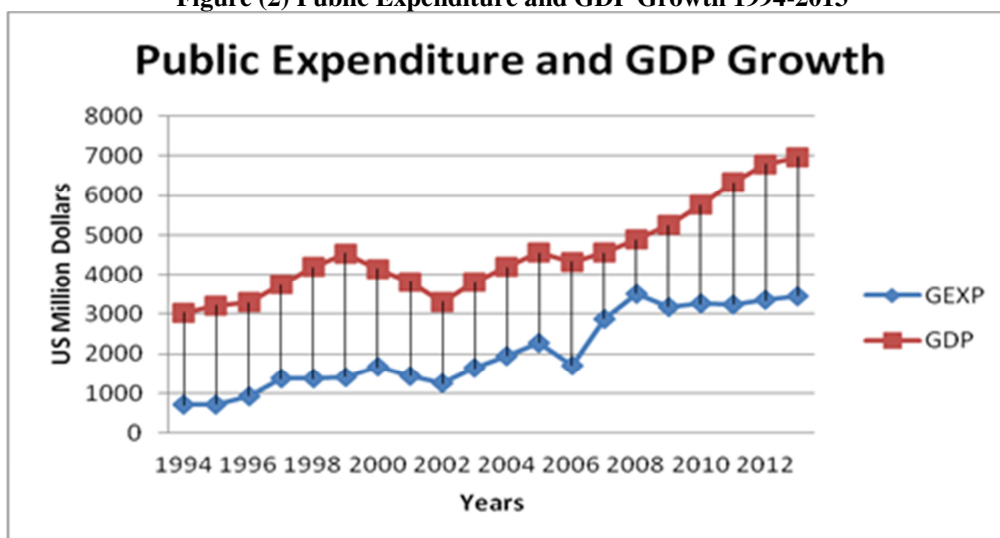**Figure (2) Public Expenditure and GDP Growth 1994-2013**

Figure (2) shows a clear comparison between public expenditure and GDP growth, taking into account the overall increase of public expenditure (GEXP) and GDP, it's clearly can be seen as GDP rises public expenditure

also rises and vice versa. It is also clear that as GDP decreases, public expenditure also decreases, i.e. both are running in the same direction. This gives a plate form of what both Wagner's Law and Keynesian hypothesis suggest.

In order to assess the percentage share of government expenditure in GDP ,figure (3) presents the public expenditure as a percentage ratio of GDP. This percentage ratio will provide us with an indication of resources which the Palestinian economy can make available to the public sector.

Figure (3) Public Expenditure As A ratio of GDP 1994-2013
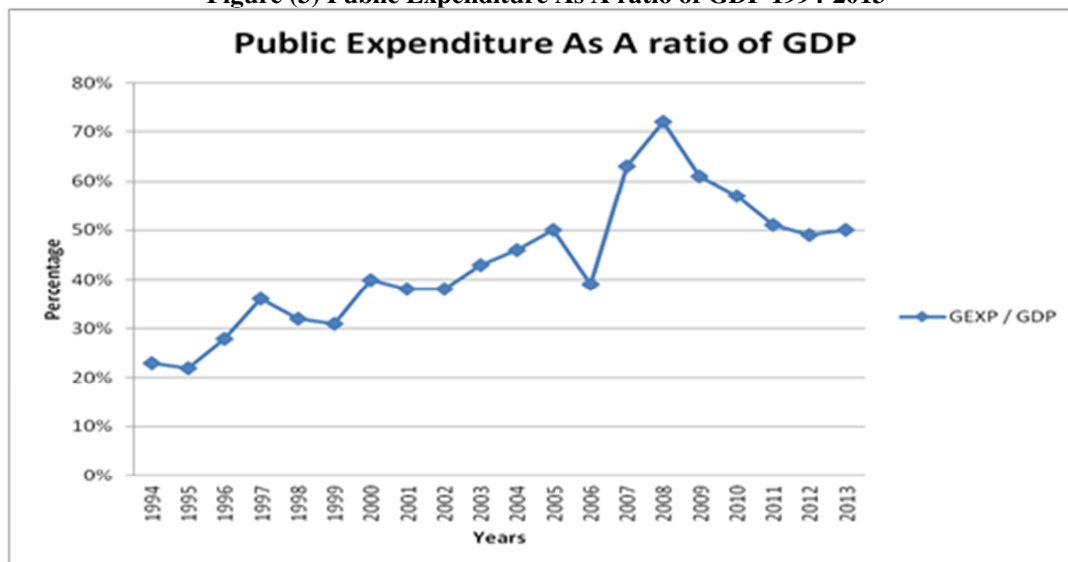
3. Theoretical Background
3.1 Wagner's Law

The expanding of the public expenditure has been linked with Wagner since 1883 and hence known as Wagner's Law of public expenditure. The core of this law is the growing importance of government activities and expenditure as an inevitable feature of a progressive state. (Bird,1971) proposed a modern formulation of the law as per capita income eases in industrializing nations, their public sectors will grow in relative importance. According to Wagner the development of public expenditure will take place due to the following three reasons:
 Firstly, an expansion of state expenditures would come about with respect to the administrative and protective functions of the state. His explanation based on substitution of public for private activity. After some years, new factors have been added, such as the increase in population density and urbanization, consequently that leads to increased state (public) expenditures on economic regulation. Secondly, he explained why he predicts a considerable relative expansion of "cultural and welfare" expenditures (especially redistribution of income and education). He assumed that these goods are "luxury goods", hence, the income elasticity of demand is greater than unity. Finally, Wagner claimed that the inevitable changes in technology and investment required in many activities would generate an increasing number of private monopolies. This effect would have to be offset, or the monopolies are taken over, by the state interests of economic efficiency (his main example was the railroad).Wagner in his original study also recognized that the state expansion has some limits. He mentioned that the proportion between government spending and national income may not be permanently overstepped. Hence, this suggests that there must be some sort of balance in the individual's outlays for the satisfaction of his/hers various needs. He thought that there has to be an upper limit of spending as a share of national income but he noted that "all earlier attempts to lay down absolute figures of expenditure or to define an upper limit of its proportion to national income, have always miscarried" (Cooke, 1958, pp. 8).

According to Dutt and Ghosh (1997), Wagner did not present any mathematical form in order to examine his hypothesis and he also was not explicit in the formulation of his hypothesis. However, there are several versions that tested the Wagner's hypothesis and the most important of them are the followings: Peacock and Wiseman(1961), Gupta (1967b), Goffman (1968) , Pryor (1969), Musgrave (1969), Goffman and Mahar (1971) and Mann (1980). These different interpretations include different measures of spending (real government spending, real government consumption spending or government spending per capita) or national income (real GDP, GDP as a share of GDP, GDP per capita) and include different functional form of the relationship between state activity and income. Finally, they have different limits of the state activity, or they do not have any limits at all.

3.2. Formulation of Wagner's Law

The inexplicit formulation of the hypothesis by Wagner himself had lifted the precise formulation of the hypothesis subjected to disagreement among economists. It can be argued that Wagner's 'law' cannot be adequately tested empirically because it is not a clear and concise theoretical construct; it amounts to looking at the past and trying to explain the upward trend in public expenditure. It is, therefore, inherently biased toward certain factors and their assumed role in the historical process. The assumptions are not clearly outlined, it is difficult to accept or reject this 'law' based on 'fact'. Moreover, the 'law' does not have an explicit empirical counterpart. Whether the relevant variables that determine public expenditure can be limited is debatable, as public expenditure is influenced by a number of socio-economic variables not all of which are quantifiable. In fact, it is not clear what variables should be used to measure both economic development and state activity. It is conventional however, to use per capita income as an index of development but this is not the only index of development nor is it the only compatible interpretation of the 'law' but it continues to be used by most economists (Michas, 1975; Bird, 1971; Goffman, 1968; Gupta, 1967; Musgrave, 1969; Pryor, 1968). Government expenditure is probably the most significant and practical measure of the state's activity.

In the absence of optimal solutions, economists have sought second best solutions to the problem of testing Wagner's 'law'. They have reasonable measures of economic development (national income) and state activity (government expenditure) and can, through the employment of econometric estimation, now isolate the effects of a few variables on public expenditure. In addition to this, the stationarity properties of the data can be assessed and the stability of the variables can be accounted for. The appropriate tools are available for the testing of such a hypothesis, a few appropriate variables can be defined to express the law explicitly in numerical terms, what is now left to decide upon is the exact functional form and method of testing.

There are in general six different formulations of Wagner's hypothesis, these are

1- Peacock-Wiseman "traditional" version $G = f(GDP)$

2- Pryor version $C = f(GDP)$

3- Goffman version $G = f(GDP/N)$

4- Musgrave version $G/GDP = f(GDPR/N)$

5- Gupta/Michas version $G/N = f(GDP/N)$

6- Peacock-Wiseman "share" version $G/GDP = f(GDP)$

where G is nominal total government expenditure, GDP is nominal Gross Domestic Product, GDPR is real Gross Domestic Product, N is the total population size, and C is government consumption expenditure.

The first formulation was employed by Peacock and Wiseman (1961), Musgrave (1969), and Goffman and Mahar (1971). The second functional form was formulated and tested by Pryor (1968). The third formulation was suggested and formulated by Goffman (1968) and Mann(1980). The fourth was utilised by Musgrave (1969), Murthy (1993), and Ram (1987). Gupta (1967) and Michas (1975) considered the fifth formulation, and the sixth formulation was suggested and tested by Mann (1980).

All of the above functional forms have been employed to test Wagner's hypothesis.

According to Wagner, "cultural and welfare" expenditures were income elastic and by

extension one of Wagner's major assumptions was that a large number of public goods and services are luxuries so that public outlay in national income is income elastic. This contention derived from his organic concept of the state. As such, economists expected the income elasticity of public expenditure to exceed unity. Bird (1971) suggested that Wagner's 'law' would be verified if the income elasticity of demand was in excess of unity. Goffman (1968) employed similar reasoning. Michas (1975) points out that the elasticity does not have to exceed unity but rather zero, depending on the functional form. For formulations one and three, an elasticity estimate would have to transcend unity to verify the 'law', but for functional forms six and four, the elasticity estimate would have to be in excess of zero. The elasticity for formulation four is defined as follows:

(1) $\eta 4 = d(G/GNP) \div d(GNP/N)$
        $\qquad G/GNP \quad GNP/N$

and it is monotonically related to the elasticity of the fifth functional form

(2) $\eta 4 = \eta 5 - 1$

(3) $\eta 4 = d(G/GNP) \div d(GNP/N) = d(G/N) \div d(GNP/N) - 1$
        $\qquad G/GNP \quad GNP/N \quad G/N \quad GNP/N$

It has now become the general consensus that Wagner had the relative growth of the public sector in mind (Timm, 1961). In addition to this, GDP per capita is used to measure increases in income, as it is a more accurate index of income advances because it accounts for population growth. A time series framework is used because as Bird (1971) states 'there is nothing in any conceivable formulation of Wagner's 'law' which tells us country A must have a higher government expenditure ratio than country B simply because the level of average per capita income is higher in A than in B at a particular point in time.' He then points out that a rising ratio over time is quite different from a higher ratio at a point in time.

Hence, inferences made from international cross sectional studies are irrelevant as tests of Wagner's 'law'. Wagner's hypothesis is undoubtedly a time series phenomenon. Hence, in this study, time series techniques are used to test for the 'law'.

Over time numerous economists have tested the presence of Wagner's 'law' in both developed and developing countries. They have employed various formulations and estimation techniques and while Wagner's 'law' appears to be supported in some instances, it is negated in others, the evidence seems more to support than to controvert the 'law'.

The operation of Wagner's 'law' is explained from a demand perspective. That is, public spending is responsive to the expansionary demand for more public goods, and state regulatory and protective activity. However, there is a budget constraint that the state must observe. The state cannot and does not behave like an unconstrained economic agent but rather it must maximize some form of welfare function subject to a budget constraint. It is plausible at the same time to associate a relationship between government revenue and national income, so that as economic activity heightens or as a country becomes wealthier, tax revenues should rise as well. Rising revenues increase the government's ability to spend.

4. Review of Selected Empirical Studies

(Henrekson,1993), examined the application of Wagner's Law in Sweden during the period 1861-1990, the empirical result of the Swedish data does not find any long run positive relationship between the public expenditure and economic growth and therefore, the study concludes that the results which found by other studies regarding Wagner's Law stand to be spurious.

(Ghali,1997) in his contribution builds on Barro's (1990) endogenous growth model to untangle the nature of the relationship between government expenditure and economic growth in Saudi Arabia by examining the inter temporal interactions among the growth rate in per capita real GDP and the share of government spending in GDP. Using vector autoregressive (VAR) analysis, the empirical analysis found no consistent evidence that government spending can increase Saudi Arabia's per capita output growth. Therefore, a fiscal policy aiming the control of the budget deficit in Saudi Arabia has to consider shrinking the size of the government and limiting its role in the economy.

(Peters, 1999) examines the plausibility of Wagner's 'law' for countries that are diverse in different ways. It presents a discussion of the applicability of the law to countries at various stages of development and with different characteristics. The unit roots test shows that some of the variables are integrated of order zero in levels. The Engle Granger cointegration test and the Johansen and Juselius maximum likelihood estimation technique of cointegrating vectors are employed to determine whether there is a long run relationship between government spending and income. While the Engle Granger test supports the existence of Wagner's 'law' for only United States and Barbados, the Johansen procedure with an improved model supports the existence of Wagner's 'law' for all countries under all assumptions. The paper finds empirical support for Wagner's hypothesis in four diverse countries. The 'law' may be applicable to a wider range of countries due to advancements in technology and communications.

(Bağdigen & Çetintaş,2002) takes into account recent advances in econometric techniques and examines Wagner's Law of long-run relationship between public expenditure and GDP for the Turkish case over the period of 1965-2000. Using the co-integration test and the Granger Causality test, the study found no causality in both directions; neither Wagner's Law nor Keynes hypothesis is valid for the Turkish case.

(Bagdigen & Cetrints, 2004), tried to study the causality between public expenditure and economic growth in Turkey, the study employed the modern econometric techniques to examine Wagner's Law of long – run relationship between public expenditure and economic growth for the Turkish case over the period of 1965-2000. The outcomes of the study did not support any causality in both directions, neither Wagner's Law nor Keynes hypothesis is valid for the Turkish case.

(Bose et al, 2007), examine the growth effects of government expenditure for a panel of 30 developing countries over the 1970s and 1980s, with a particular focus on disaggregated government expenditures, the primary results of the study were of twofolds. First, the share of government capital expenditure in GDP is positively and significantly correlated with economic growth, but current expenditure is insignificant. Second, at the disaggregated level, government investment in education and total expenditures in education are the only outlays that are significantly associated with growth once the budget constraint and omitted variables are taken into consideration.

(Lamartina &Zaghini,2008) brought an empirical analysis to the joint development of government expenditures and economic growth in 23 OECD countries. The empirical evidence provides indication of a structural positive correlation between public spending and per-capita GDP which is consistent with the Wagner's law. In addition, according to Wagner's law, the study found that the correlation is usually higher in countries with lower per-capita GDP, suggesting that the catching-up period is characterized by a stronger development of government activities with respect to economies in a more advanced state of development.

(Kumar et al,2009), examined Wagner's Law for New Zealand using time series data for the period 1960 to 2007. The autoregressive distributed lag bounds test technique was used to select the optimal model and these results suggest that there is a co integrating relationship between the share of government spending in national output and per capita income. The results suggest that output measures Granger-cause the share of government expenditure in the long run, thereby providing support for Wagner's Law, and these results are stable irrespective of the chosen output measure.

(Alexiou,2009) provides further evidence on the relationship between economic growth and government spending. The study applied two different panel data methodologies to seven transition economies in the South Eastern Europe, generating significant results which, if considered, may enhance the economic performance of the countries in the region. More specifically, the evidence generated indicate that four out of the five variables used in the estimation i.e. government spending on capital formation, development assistance, private investment and trade-openness all have positive and significant effect on economic growth. Population growth in contrast, is found to be statistically insignificant.

(Verma & Arora, 2010), in their study provide empirical support to the strict version of the Wagner's law in case of India for the period 1950-51 to 2007-08. To test the hypothesis, the popular six mathematical models of Wagner's law have been estimated. An econometric based cointegration analysis has been utilized to identify the long-run relationship between the time series variables. The overall conclusion that emerges from the empirical analysis is that there exists long-run relationship between economic growth and growth of public expenditure in case of India. The results provide a strong empirical support for the existence of Wagner's law in pre and post reforms period. It has also been found that the impact of second phase of liberalization is statistically significant and supports the Wagner's law even when a significant fall in the elasticity in the post reform period had taken place. Empirical evidences regarding short-run impact of economic growth on public expenditure is insignificant which confirms the absence of any instantaneous impact of increasing GDP on the size of government expenditure.

(Al Bataineh,2012) tried to investigate the impact of public expenditures on economic growth in Jordan for the period (1990 – 2010). The study adopted different regression models to analyze the time series data. The study found that the government expenditure at the aggregate level has positive impact on the growth of GDP which is compatible with the Keynesians theory. It was also found that the payment is proved to have no influence on GDP growth, such result does not support Wagner's Law .

(Desmond et al,2012) examined the effect of public expenditure on economic in Nigeria for the period 1970 – 2009. The major objective of this paper was to analyze the effect of public government spending on economic in Nigeria based on time series data on variables considered relevant indicators of economic growth and government expenditure. Results of the analysis showed that capital and recurrent expenditure on economic services had insignificant negative effect on economic growth during the study period. Also, capital expenditure on transfers had insignificant positive effect on growth. But capital and recurrent expenditures on social and community services and recurrent expenditure on transfers had significant positive effect on economic growth. Consequently, the study recommended more allocation of expenditures to the services with significant positive effect.

(Kuckuck, 2012) tried to test the validity of Wagner's law of increasing state activity at different stages of economic development for five industrialized European countries: the United Kingdom, Denmark, Sweden, Finland and Italy. In order to investigate the coherence between Wagner's law and development stage, the study classified every country into three individual stages of income development and applied advanced cointegration and vector error correction analyses. In line with Wagner's hypothesis, the findings show that the relationship between public spending and economic growth has weakened with an advanced stage of development. All countries support the notion that Wagner's law in its pure form may have reached its limit in recent decades.

(Al Galbi,2012) examined statistically the causal relationship between government expenditure and gross domestic product in Iraq over the period 1975-2010. The study applied recent developments in time-series analysis to test statistical characteristics of both variables. The stationary and co integration tests indicate that government expenditure and GDP are first-difference stationary and co integrated. The Granger causality statistical results provide some evidence of a unidirectional causation running from gross domestic product to government expenditure in Iraq over the period of (1975-2010) .

(Edrwash & AbdulQader,2012) tried to prove the validity of Wagner's Law hypothesis in Algeria, Taking into account recent advances in econometric techniques and examines Wagner's Law of short and long run relationship between public expenditure and GDP for the Algeria case over the period of 1970-2010. The study found four versions Wagner basic laws show an interrelationship between the GDP and government development expenditure. The long-term analysis also showed that GDP has a positive relationship and is significant in influencing government development expenditure. Therefore, it can be said that Wagner's law is still relevant to be applied in Algeria.

(Egbetunde& Fasanya,2013) in their paper studied the impact of public expenditure on economic growth in Nigeria during the period 1970 to 2010. The study employs the bounds testing (ARDL) approach to examine the long run and short run relationships between public expenditure and economic growth in Nigeria. The bounds test suggested that the variables of interest put in the framework are bound together in the long-run. The associated equilibrium correction was also significantly confirming the existence of long-run relationships. The findings indicate the impact of total public spending on growth to be negative; which is consistent with other past studies. Recurrent expenditure however was found to have little significant positive impact on growth. The study concludes that, government should increase its spending on infrastructure, social and economic activities.

(Srinivasan,2013) held an investigation of the causal nexus between public expenditure and economic growth in India over the period of 1973-2012. The cointegration test result confirms the existence of long- run and short – run equilibrium relationship between public expenditure and economic growth in India. The empirical results based on the error- correction model estimate indicates one- way causality runs from economic growth to public expenditure in the short run and long run supporting Wagner's Law of public expenditure. The study suggests that public expenditure is growing more rapidly than the income of the economy and hence validates Wagner's Law in the case of India.

5. Specification of The Study Model

In order to reach an intact test of the Wagner's Law various modern econometric techniques were adopted. First, as the aim of this research paper is to examine the causal relationship between public expenditure and GDP by recent advanced econometric techniques, we utilize six versions of regression models on Wagner's Law as presented in Table 1.

Table 1: Versions of Wagner's Law in Regression Form

NO	Version	Regression Equation
1	Peacock-Wiseman (1961)	LREXPt = β0 + β1LRGDPt + µt
2	Gupta (1967)	LREXPt = β0 + β1LRPGDPt + µt
3	Goffman (1968)	LR(EXP/GDP) t = β0 + β1LRGDPt + µt
4	Pryor (1969)	LR(EXP/GDP) t = β0 + β1LRPGDPt + µt
5	Musgrave (1969)	LRPEXPt = β0 + β1LRPGDPt + µt
6	Mann (1980)	LRGCt = β0 + β1LRGDPt + µt

Notes: L is Natural Logarithms, R is Real, P is Per Capita, EXP is Public expenditure, GDP is Gross Domestic Product, GC is Government Consumption excluding Investments, N is Population Size, β0 is Constant, β1 is Coefficient, µ is error, and t is time

Second, we investigate the stationarity properties of the time series using the Augmented Dickey-Fuller (ADF) test. The purpose of 'augmenting' the Dickey-Fuller (DF) regression is to get *white noise* errors. A series Yt is said to be integrated of order d denoted by Yt ˜I(d) if it becomes stationary after differentiating d times and thus Yt contains d unit roots. A series which is I(0) is said to be stationary. To determine whether a series is stationary or nonstationary, unit root test developed by Dickey and Fuller (1979) is used. The ADF test is based on the estimate of the following regression:

$$\Delta Y_t = \alpha_o + \alpha_1 Y_{t-1} + \sum_{j=1}^{p} y_{ji} \Delta Y_{t-j} + \varepsilon_t \dots\dots\dots\dots\dots(1)$$

Where, Δ is the first-difference operator, *p* is lag, 0 α is constant, 1 α and *ji y* s are parameters and ε_t denotes stochastic error term. If α1 = 0, then the series is said to have a unit root and is nonstationary. Hence, if the hypothesis, α1 =0, is rejected for the above equation it can be concluded that the time series does not have a unit root and is integrated of order zero, i.e. it has stationarity properties.

Third, we employ Engle-Granger's (1987) co-integration test to determine if the variables in the system are co-integrated. The Engle- Granger procedure needs an estimation of the co-integrating regression equation. Thus, if there are *n* series, *Y*t1 . . . *Ytn*, the co-integrating regression is given by:

$$Y_{t1} = \beta_o + \sum_{j=2}^{n} \beta_j y_{tj} + \varepsilon_t \dots\dots\dots \dots\dots \dots(2)$$

Residuals from the regression 2 are to be tested for the presence of a unit root using the ADF test. If the residuals, et, from the regression are I(0), i.e. stationary, then variables are said to be co-integrated and hence interrelated with each other in the long-run.

Fourth, we investigate the direction of causality between Expenditure and GDP using Granger causality test. To perform the test, we consider the systems of equations as

$$\Delta EXP_t = \lambda_1 + \sum_{i=1}^{p} \beta_{i1} \Delta EXP_{t-i} + \sum_{i=1}^{q} \alpha_{i=1} \Delta GDP_{t-i} + \mu_t \dots\dots\dots\dots\dots(3)$$

$$\Delta GDP_t = \lambda_2 + \sum_{i=1}^{I} \beta_{i2}\Delta EXP_{t-i} + \sum_{i=1}^{m} \alpha_{i2}\Delta GDP_{t-i} + \varepsilon_t ....(4)$$

Where Δ is the first-difference operator; β_{ij}'s and α_{ij}'s are parameters; and λ_{I}'s are constant terms. In Equation 3, the null-hypothesis (which is as H0: $\alpha_{11} = \alpha_{21} = \ldots\ldots = \alpha_{q1} = 0$) tested against the alternative hypothesis (which is as H1: α_{ij}'s *are jointly significant*). If we reject H0, we would conclude that economic growth Granger causes public expenditure. Similarly, in Equation 4, the null-hypothesis (which is as H0: $\beta_{12} = \beta_{22} = \ldots\ldots = \beta_{l2} = 0$) is tested against the alternative one (which is as H2: β_{ij}'s *are jointly significant*). If we reject H0, then we would conclude that growth in public expenditure leads economic growth.

6. Empirical Results and Discussion

One of the main characteristics of the time series data is the non- stationary issue, given the variables of the present study, the time series of such variables are tested in order to know wether they suffer from non-stationary problems or not. Table (2) presents the results of the Augmented Dickey-Fuller (ADF) Unit Root test of the time series.

Table (2) Augmented Dickey-Fuller (ADF) Unit Root test

Variables	ADF Test Statistics	Stationarity
LREXP	-4.36 [1] (-2.95)	I (1%)
LRGDP	-9.63 [2] (-2.95)	I (1%)
LRPGDP	-27.82 [2] (-2.95)	I (1%)
LREXP_RGDP	-3.54 [2] (-2.95)	I (1%)
LRPEXP	-3.89 [1] (-2.95)	I (1%)
LRGC	-5.66 [2] (-2.95)	I (1%)

- All regression estimations and test results are obtained by using Eviews econometric software.
- ADF statistics with intercept are obtained by taking Akaike Information Criterion (AIC) into account.
- significant and Lagged differences are shown in brackets.
- critical values of MacKinnon at 5% level are shown in parenthesis.

The results show that all the time series data are free from non- stationary problem and therefore, the null hypothesis (H$_0$) of the root unit can be rejected at the first difference (I). Such results mean all the series (LREXP, LRGDP, LRPGDP, LREXP_RGDP, LRPEXP, and LRGC) are stationary at the first difference. Cause all the time series are stationary at I (1), the two variables of Wagner's Law can be integrated of order one.

The second step of the empirical analysis is to perform the Engle-Granger's co-integration test. The statistical results of such test are shown in table (3) as follows:

Table (3) The Engle-Granger's Residuals Based on Co-integration Test Results

Model	No of Lag	ADF Test Statistics
Mode 1 : LREXPt = β0 + β1LRGDPt + µt	3	-0.384
Mode 2 : LREXPt = β0 + β1LRPGDPt + µt	3	0.663
Mode 3 : LR(EXP/GDP)t = β0 + β1LRGDPt + µt	3	-0.449
Mode 4 : LR(EXP/GDP)t = β0 + β1LRPGDPt + µt	3	0.594
Mode 5 : LRPEXPt = β0 + β1LRPGDPt + µt	3	0.786
Mode 6 : LRGCt = β0 + β1LRGDPt + µt	3	-0.197
Asymptotic Critical Values		
1 %		-3.90
5 %		-3.34
10 %		-3.04

- The number of lags used in ADF regressions was selected using Akaike Information Criterion (AIC).
- Asymptotic Critical Values (ACV) are taken from Davidson and Mackinnon (1993:722).

The results of the Engle-Granger's Residuals test indicate that the null hypothesis (H$_0$) of no co integration among various definitions of public expenditure and GDP cannot be rejected. This result means the model cannot be estimated in levels, because the two variables are non - stationary. Thus the variables in the first difference form must be used for standard Granger causality test. So the next step of the on going empirical analysis must investigate the direction of causality between public expenditure and GDP by using Granger causality test. The results of this test are presented in table (4).

Table (4) Results of Granger - Causality Tests

Hypothesis	Lag	F Statistics	P Value of F	Decision
H$_0$ (1.1) : LRGDP does not cause LREXP	**1,1**	16.84	(0.000)	**Reject**
Model 1				
H$_0$ (1.2) : LREXP does not cause LRGDP	**3,1**	9.16	(0.000)	**Reject**
H0 (2.1) : LRPGDP does not cause LREXP	**1,1**	3.6	(0.021)	**Reject**
Model 2				
H0 (2.2) : LREXP does not cause LRPGDP	**3,3**	5.4	(0.000)	**Reject**
H0 (3.1) : LRGDP does not cause LREXP_LRGDP	**1,4**	8.45	(0.0002)	**Reject**
Model 3				
H0 (3.2) : LREXP_LRGDP does not cause LRGDP	**3,3**	6.92	(0.0004)	**Reject**
H0(4.1) : LRPGDP does not cause REXP_LRGDP		15.36	(0.008)	**Reject**
Model 4				
H0(4.2) : LREXP_LRGDP does not cause LRPGDP		7.87	(0.0005)	**Reject**
H0 (5.1) : LRPGDP does not cause LRPEXP		9.66	(0.0001)	**Reject**
Model 5				
H0 (5.2) : LRPEXP does not cause LRPGDP		4.55	(0.008)	**Reject**
H0 (6.1) : LRGDP does not cause LRGC		3.8	(0.002)	**Reject**
Model 6				
H0 (6.2) : LRGC does not cause LRGDP		2.6	(0.005)	**Reject**

F Statistics are of FWALD-statistics. P values are of F significance, Lag denotes lag numbers in equation 3 and 4.

The results of the Granger - Causality Tests which are reported in table (4) indicate clearly the rejection of the null hypothesis (H$_0$) and hence, the alternative hypothesis (H$_1$) will prevail which supports the Wagner's law of public expenditure. on the other hand, the results of the Granger - Causality Tests indicate also a relationship between public expenditure and GDP growth, a result which run in line with the Keynesian analysis regarding the role of public expenditure in boosting the growth level of GDP.

Thus, on the basis of the results given in table (4) there is a long-run relationship between public expenditure and GDP growth, and the causality exists in both the direction. This means public expenditure leads to growth GDP, and the GDP growth leads also to the expansion of public expenditure, therefore, both the hypothesis (i.e. Wagner's law and Keynesian hypothesis) stand to be relevant in case of Palestine. Such results provide a parallel understanding with the results of the previous study such as, (Peters, 1999), for a set of countries that are diverse in different ways, (Bose et al, 2007), for a developing countries, (Lamartina &Zaghini,2008) in 23 OECD countries,(Alexiou,2009) for a seven transition economies in the South Eastern Europe, (Kumar et al,2009) for New Zealand, (Verma & Arora, 2010) of India, (AlBataineh,2012), in the case of Jordan, (Edrwash & AbdulQader,2012) in Algeria,(Srinivasan,2013) in the case of India. On the contrary, the results of the present study appear to be against that of (Ghali,1997) , wgich found no consistent evidence that government spending can increase Saudi Arabia's per capita output growth , (Bağdigen & Çetintaş,2002),which found no causality in both directions for the Turkish case ,(Kuckuck, 2012) which found that the relationship between public spending and economic growth has weakened with an advanced stage of development in the industrialized European countries,(Bagdigen & Cetrints, 2004), in Turkey which found no causality in both directions, neither Wagner's Law nor Keynes hypothesis is valid for the Turkish case,(Henrekson,1993), which ended with no long run positive relationship between the public expenditure and economic growth in Sweden.

7. Conclusion

As this study seeks to explore the causal relationship between public expenditure and the GDP growth in the Palestinian territories over the period of 1994-2013. For achieving this purpose trends in both public expenditure and GDP growth in Palestine are discussed, the paper also explored the relevant literature regarding Wagner's Law and the recent related empirical studies in various countries of the world. The study has adopted recent advances of econometric techniques. For this purpose, stationarity properties of the data and the order of integration of the data are, firstly, empirically investigated by the Augmented-Dickey Fuller (ADF) test. Hypothesis of a long-run relationship between public expenditure and GDP growth has been tested by Engle-Granger co-integration test. ADF test results show that all the variables were non-stationary in levels, but stationary in first differences [1]. Since the variables for each regression model are integrated of [I], the study applied co-integration test to all versions of the regression models.

Depending on the co-integration results of the six versions of Wagner's Law, the findings reveal that there is a co-integration between public expenditure and GDP growth. Such results indicate that there is a long-run relationship between public expenditure and GDP growth for the Palestinian case. On the basis of the Granger

causality tests, we also found that both public expenditure and GDP have a cause effect on each other and, therefore, it can be stated clearly that public expenditure does cause GDP growth and vice versa. This present study suggests that both public expenditure and GDP are growing substantially and hence validate Wagner's Law and also validate Keynesian hypothesis in the case of Palestine. This is mainly due to the expansion of public expenditure, mainly on the current side, by the Palestinian National Authority due to a set of economic , social and political factors. Therefore, emphasis must be given to the developmental expenditure which can cause the real effect on GDP growth.

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