

TRUE OR FALSE: EMPIRICAL EVIDENCE ON WAGNER'S LAW FROM CYPRUS

Abdul GHAFOR*

Abstract

The paper attempts to test Wagner's law by examining relationships between GDP and total public expenditure as well as its various components for North Cyprus during the period 1977-2001. Philips-Perron tests are used to check the stationary properties of all series. The Johansen full information maximum likelihood method is used to identify the long-run relationships between GDP and various components of public expenditure. In the case of long run relationships, the Granger bivariate procedure is used to identify the direction of causality. Where variables are not cointegrated, Granger's causality technique is employed to test the direction of short run causation.

Keywords: Wagner's law, disaggregated public expenditure, economic growth, Cyprus.

Özet

Bu çalışma Kuzey Kıbrıs'da 1977-2001 dönemindeki GDP ve toplam kamu harcamalarının farklı kalemleri arasındaki ilişkiyi inceleyerek Wagner Kanununu test etmeyi amaçlamaktadır. Kullanılan verilerin geçerliliğini test etmek için Philips-Perron testleri; GDP ile kamu harcamalarının farklı bileşenleri arasındaki uzun dönemli ilişkileri belirlemek için de Johansen'in maksimum olasılık testi kullanılmıştır. Kısa dönemli sebep – sonuç ilişkileri içinse Granger testi kullanılmıştır.

Anahtar Kelimeler: Wagner kanunu, kamu harcamaları, ekonomik büyüme, Kıbrıs

1. Introduction

In recent years, the relationship between public expenditure and economic growth has been the subject of considerable debate among researchers and policymakers. This issue has gained more attention in small island economies (SIEs) where the public sector is assumed to be

* Associate Professor, Cyprus International University

small in size. However, the literature provides enough evidence that in many SIEs public sectors are relatively large. It is argued that since SIEs have limited natural resources and are considered geographically remote, the public sector plays a major role in their social and economic development. It serves as the main employer, investor and provider of social goods and services (Grossman, 1988)¹. However, since these activities are financed through tax, they may offset the positive effect of government intervention. Furthermore, the public sector is considered inefficient due to a complex bureaucratic system and political intervention which tend to promote the interest of certain groups. Above all, in SIEs, the potential to increase public revenue through taxes is very low because of slow growth, a small private sector and a large share of unregistered economy. Therefore, governments of SIEs have been facing a continuous increase in budget deficit over time which has caused serious financial and macroeconomic instabilities. Thus, many economists suggest shifting economic priorities from a past policy of deficit financing towards an expenditure reduction policy². These policies can be developed by evaluating the net impact of public expenditure on economic growth.

The relationship between public expenditure and economic growth can easily be studied by testing Wagnerian and Keynesian hypotheses. According to Wagner's law³, public expenditure and national income possess a long run equilibrium relationship where public expenditure is considered an outcome of national income growth and therefore is being treated as endogenous in designing economic policy (Wagner, 1958). In contrast, Keynes' hypothesis treats public expenditure as an exogenous policy instrument since Keynesians believe that public expenditure helps economic development and corrects short-term cyclic fluctuations. Many

¹ Such as provision of a legal and social framework, police services, judiciary, enforcement of property rights, market regulation, development of infrastructure, regulation of externalities and transfer of payments for maintaining social harmony and improving the productivity of factors of production.

² It is argued that deficit financing has not only created a problem of high inflation but it also crowds out private investment in the long-run.

³ A German economist Adolph Wagner proposed Wagner's law (Wagner 1958). It states that public expenditure increases as the income level of the country increases. He argues that the development of society puts pressure on governments to increase investment in infrastructure and other social sectors. Thus, there is a tendency of public expenditure to increase in the long run.

researchers have tested these two hypotheses for various industrial and developing countries by using single country time series or inter country cross section analyses⁴. Among these studies, only a few have used disaggregated data in their analyses. For instance, Courakis et al. (1993) provides evidence from Greece and Portugal on the validity of Wagner's law in the case of transfers of payments. On the other hand, Chletsos and Kollias (1997) noted that the growth of defence expenditure could be explained in terms of Wagner's law in the case of Greece. The study of Biswal et al. (1999) provides a detailed analysis of the relationship between various categories of public expenditure and income level in the case of Canada. Although, the results of this last study do not support the existence of any long-run relationship between GDP and disaggregated public expenditure variables, they do support the existence of short-run causation implying that national income may cause the growth of total current public expenditure in the short-run.

The present study aims to test Wagnerian and Keynesian hypotheses for a small island, "Cyprus", particularly using data from Northern Cyprus as a case study. Since its creation in 1974, government expenditure in Northern Cyprus (NC) has increased from 31% to 51% of GNP while the government revenue has increased only from 17% to 20% which has left the country in a large and permanent budget deficit. As Northern Cyprus is characterised as a small island economy with a limited tendency to increase public revenue through taxation, emphasis may need to be given to public expenditure reduction policies rather than deficit financing. Such policies can only be established in the presence of sound evidence of what causes what. Jackson et al. (1999) have tried to investigate the relationship between public expenditure and income level in the case of Northern Cyprus; they have used aggregated data of total public expenditure with and without transfers and the empirical results of their study do not provide enough ground to design long-run

⁴ These studies found mixed evidence to support these hypotheses. The studies that support Wagner's hypothesis include Gupta (1967), Peacock and Wiseman (1967), Beck (1981), Lin (1995) and Ahsan et al. (1996). The studies which found bidirectional causality between public expenditure and economic growth include Beck (1979), Sahni and Singh (1984), Ansari (1993), and Oxley (1994). Some researchers either found no or mixed evidence to support these hypothesis. These studies include Musgrave (1969), Michas (1975), Ram (1986, 1987), Holmes and Hutton (1990) Chletsos and Kollias (1997) and Biswal et al. (1999).

macroeconomic policies. Chletosos and Kollias (1997) argued that the use of the disaggregated public expenditure variables could provide a better explanation of the role of each component of public expenditure in the economic development process and help in establishing sound and sustainable macroeconomic policies. Therefore, it is necessary to conduct a detailed empirical investigation of the relationship of various categories of public expenditure and economic growth that can suggest ways to reduce public expenditures by improving their compositions and reshaping their priorities. Ram (1987) also supports single country analysis by using disaggregated data instead of a cross-countries analysis. He argues that since Wagner's law is dynamic, it should be studied over time. A cross-sectional analysis does not provide necessary information to deal with a country's problems and leads us nowhere. Thus, this study is novel in two ways. First, it contributes to the existing literature since it examines Wagner's law by using disintegrated data on public expenditure of Northern Cyprus. Secondly, it attempts to use empirical results in developing a sustainable macroeconomic policy.

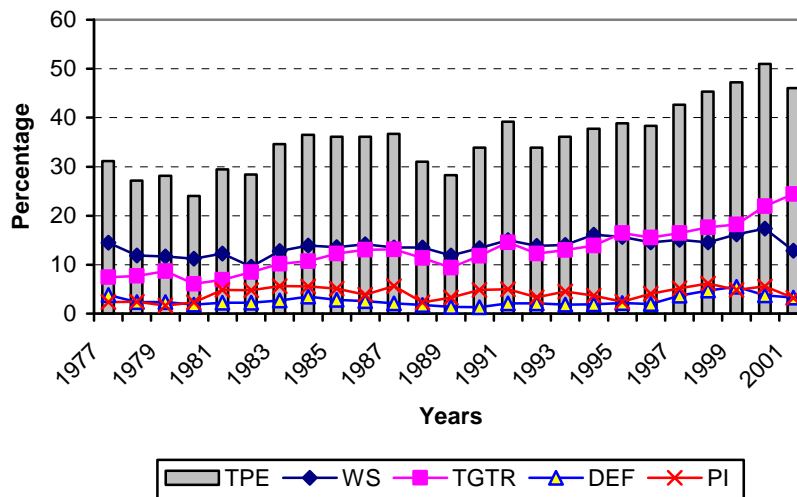
The following section presents an overview of public expenditure growth in Northern Cyprus. Section 3 discusses general issues related to methodology and data collection, while section 4 offers a detailed discussion of econometric procedure for unit root, cointegration, and causality tests. The empirical results are also reported in the same section. Section 5 analyses the empirical results and discusses its policy implications particularly in the case of Northern Cyprus. Finally, some conclusions are reached in section 6.

2. Public Expenditure in North Cyprus: An Overview

The relative importance of the public sector in an economy can easily be revealed by examining the ratios of various categories of public expenditure to GNP each year. Figure 1 indicates that despite the fact that Northern Cyprus is characterised as a small island economy; it has had a significantly large public sector since the beginning. Although total public expenditure (TPE) as a percentage of GNP declined from 31% to 24% during 1977 to 1980, this trend reversed afterward and gradually increased overtime until it reached a level of 51% in 2000 (State Planning Organisation, 2002).

This situation indicates that the government of Northern Cyprus is consistently fighting a large budget deficit. It can also be observed that the composition of public expenditure has gone through many changes over the twenty-five year period under consideration. Unlike many other countries, public expenditure on wages and salaries (WS) has shown very little change over time. On the other hand, total government transfers (TGTR) have increased from 7.45% in 1977 to 24% in 2001 and have emerged as the most important category of public expenditure. Similarly, public investment (PI) has increased from 2.38% in 1977 to 5.51% in 2001. Public expenditure on defence, however, oscillated between 2.24% to 3.26% during the period under consideration.

Figure 1. Various Categories of Public Expenditure as Percentage of GNP



Many economic, social and political reasons have contributed to the upward trend of total government transfers and public investment. In the case of total government transfers, an early retirement policy and a high interest rate have played a major role. A high interest rate motivates individuals to take early retirement and to deposit retirement money in the bank to get a very high return along with their side businesses. Many of these retired individuals were also able to find a part time job in their own departments. This situation helps in reducing the share of wages and

salaries in total public expenditure but it increases the transfer of payments to a significant level in the form of pensions. Furthermore, since Northern Cyprus has not yet been recognised by the world community, the private sector does not come forward to invest in large or long-term projects which has forced the government to increase its investment in the provision of economic and social goods and services. Consequently, the government followed public sector leading policies, which has increased public investment over time.

3. Definitions of Various Categories of Public Expenditure

By economic classification, public expenditures can be divided into two main categories: purchases and transfers. Government purchases or public expenditure on goods and services (PEGS) is divided into two sub-categories: expenditure on other goods and services (OGS) and expenditure on wages and salaries (WS)⁵. The second main category of public expenditure is transfers. Although government transfers are commonly divided into two sub-categories: transfer to persons and transfer to business. Such a distinction cannot be made in the case of Northern Cyprus due to unavailability of detailed information at this level. Therefore, we have used total government transfers (TGTR) in this study. Many economists prefer to add together public expenditure on goods and services and government transfers. This category is called total current expenditure (TCE)⁶. The next most important category of government expenditures is net interest paid on funds borrowed or public debt (IPD) and public investment (PI). Since Northern Cyprus has not been recognised by the world community, Turkey is the only source of borrowing. These loans neither bear any interest nor are likely to be repaid. Thus, there is no actual interest paid in the case of Northern Cyprus. However, two concepts of total public expenditure {total public expenditure without interest on public debt (TPE_{woi}) and total expenditure with 10% hypothetical interest on total public debt (TPE_{wi})} have used in this study to realise the situation if Northern Cyprus has to pay interest on her debt. Public expenditure on national defence (DEF) is considered as a

⁵ It includes both civilian and military personnel.

⁶ The literature explains that the inclusion of government transfers into government purchase does not affect empirical results significantly. However, it may overstate the size of government expenditure. It is wise to study the impact of these two categories separately since government purchase relates to fiscal policy while government transfers relate to stabilisation policy.

separate category which uses a significant amount of scarce national resources that may be used for various social development projects. However, the importance of defence expenditure is always debatable. Summing PEGS, TGTR, DEF and PI; and PEGS, TGTR, DEF, PI and IPD respectively can derive both TPE_{woi} and TPE_{wi} .

4. Model Selection

The literature provides different functional forms to test the validity of Wanger's hypothesis. The following however is the most popular one⁷.

$$PE_i/P = f(GDP/P) \quad (1)$$

Where P is the population, PE_i is the i th component of public expenditure ($i = TPE_{woi}, TPE_{wi}, PEGS, TCE, TGTR, DEF, PI$ and IPD), PE_i/P is the i th component of public expenditure measured in per capita and GDP/P indicates per capita gross domestic product. This model was originally used by Gupta (1967) and Michas (1975) to estimate the elasticity of public expenditure per capita with respect to GDP per capita and Wagner's hypothesis is validated if the elasticity of public expenditure with respect to GDP per capita exceeds unity⁸.

The literature argues that if two variables are integrated of the same order {I(1) or higher order} then either uni-directional or bi-directional Granger causality must exist in the I(0) variables (Engle and Granger, 1987). It means that the verification of Wagner's hypothesis need to investigate whether or not public expenditure and GDP possess any long run relationship (cointegrated) and whether or not GDP Granger causes government expenditure. If these conditions are met, the Wanger's hypothesis is verified. Equation (1) can be specified in a general logarithmic form as follows.

$$\ln (X_i)_t = a + b \ln (Y)_t \quad (2)$$

Where $(X_i)_t$ represents various categories of public expenditure per capita over time and $(Y)_t$ represents GDP per capita over time. To verify Wagner's and Keynes' hypotheses, annual data of various categories of

⁷ The other two functional forms are: $PE_i = f(GDP)$ and $PE = f(GDP/P)$ which were originally used by Peacock and Wiseman (1961), Musgrave (1969) and Goffman and Mahar (1971); and Goffman (1968) respectively.

⁸ To test the Keynesian hypothesis, the equation is expressed in the form of GDP per capita as a function of public expenditure.

public expenditure and GDP per capita for Northern Cyprus over the period of 1977-2001 has been used⁹. All series are expressed in real terms using constant price of 1977 = 100. All data were collected from published material of the State Planning Organisation (2002). Detailed econometric procedures along with empirical results are discussed in the following section.

5. Empirical Results

5.1 Stationarity and Level of Integration

An important and implicit assumption underlying regression analysis involving time series data is that such data are stationary¹⁰. If this is not the case, the cointegration and causality tests are not valid. Therefore, it is required to examine the univariate stationarity properties of time series prior to subsequent bivariate modelling or inference. Two stationarity tests, proposed by Dickey and Fuller (1979, 1981) and Philips and Perron (1988), are used to determine the order of integration. The following general equation is used to test the unit root properties of the series X_t .

$$\Delta X_t = \alpha X_{t-1} + \sum_{i=1}^p \gamma_i \Delta X_{t-i} + \varepsilon_t \dots \dots \dots (3)$$

Where Δ is the first-difference operator and ε_t is assumed to be Gaussian white noise. The number of lags 'p' in the dependent variable is chosen by the Akaike Information Criteria (AIC) to ensure that the errors are white noise¹¹. Unit root tests of this type are called the Augmented Dickey-Fuller (ADF) test. The null hypothesis is that the series is non-stationary against the alternative hypothesis of stationarity. The ADF test is based on the estimated parameter α and its corresponding t-statistics. When $\alpha = 0$, the time series X_t is non-stationary. The main problem with the ADF test is that it involves the inclusion of extra differences terms in the testing equation. This results in a loss of degrees of freedom and a

⁹ The period of 1974 to 1976 has not been included in this study because this period is considered as the period of rehabilitation and the establishment of an administrative framework.

¹⁰ A stationary variable is one that tends to return to constant mean and variance over time.

¹¹ Akaike Information Criteria (AIC) and the Schwartz Criteria (SC) are commonly used for the selection of lag length. According to AIC all variables have a lag length of 1 except DEF and WS which have shown a lag length of 2.

resultant reduction in power of the testing procedure particularly when the number of observations is limited. Alternatively, the Philips-Perron (PP) approach allows for the presence of unknown forms of autocorrelation and conditional heteroscedasticity in the error term, and is based on testing the same regression equation as ADF except that $p=0$. For both tests, a t-statistic larger in absolute value than the critical value rejects the null hypothesis of a unit root in favour of the stationarity alternative. Since the Lagrange Multiplier test indicated the presence of autocorrelation, the Philips-Perron test has been used to test for a unit root. The results for unit root tests are presented in Table 1.

Table 1. Results of Philips-Perron Test for Unit Root.

Variable	Level		1 st Difference
	Intercept	Intercept + Trend	Intercept
GDP	-1.0198	-1.7414	-4.6108**
WS	-0.8802	-2.9697	-4.1011**
OGS	-1.7840	-4.0548	-7.3802**
PEGS	-0.8869	-3.1590	-4.4930**
TGTR	-0.1536	-2.8656	-4.8754**
TCE	-0.1847	-3.3606	-5.1436**
DEF	-1.1279	-2.6205	-4.0216**
PI	-2.1993	-2.8967	-5.7409**
TPE _{woi}	-0.4074	-3.3910	-4.7611**
IPD	-1.6716	-2.8672	-5.3381**
TPE _{wi}	-0.3630	-3.4095	-4.7475**
Mackinnon Critical Values #			
1%	-3.7343	-4.3942	-3.7497
5%	-2.9907	-3.6118	-2.9969
10%	-2.6348	-3.2418	-2.6381

The corresponding critical values are obtained from Mackinnon (1991).

Results shows that the levels of all variables under consideration are non-stationary with or without including trend in equation 3 and the null hypothesis can only be rejected for the first difference¹². Thus, the Philips-Perron test for unit root concludes that all variables are integrated of order one, i.e., I(1).

¹² These results also indicate that all series are Difference Stationary Process (DSP) against the alternative of Trend Stationary Process (TSP).

5.2 Cointegration Analysis

Two stationary variables of the same order are said to be cointegrated if their linear combination is stationary. Furthermore, according to Johansen (1991), all variables in a bi- or multivariate model should be of the same order of integration for vector autoregressive (VAR) estimation¹³. Since all models in this study are bivariate and all variables under consideration are of the same order, i.e., I(1), the necessary condition of all variables being of the same order can easily be met. The critical condition for the existence of cointegration is that the residuals from the estimated cointegrating regression be integrated of order zero, i.e., I(0). Therefore, the next step is to perform cointegration analysis for all forms of equation 3 to find out if the variables in these equations are cointegrated. The existence of cointegration would confirm a long-run relationship among the variables in that equation.

Although the Engle-Granger (1987) method is widely used in the literature for cointegration analysis¹⁴, it only provides information about the existence of a unique cointegrating vector. On the other hand, the Johansen full information maximum likelihood (ML) method provides information regarding all possible cointegrating vectors in an equation (Johansen and Juselius, 1990). For instance, if there are N number of variables, there can be at most $r=N-1$ cointegrating vectors. Therefore, in the present study, the Johansen method has been used for cointegration analysis. The cointegration results are reported in table 2.

¹³ Charemza and Deadman (1997), however, relax this condition and argue that the same order of integration for all variables is not a necessary condition for VAR estimation in a multivariate context. They assert that if the order of integration of the dependent variable is lower than the highest order of integration of the explanatory variables, there should be at least two explanatory variables of this highest order in an equation in order to be able to perform a cointegration analysis.

¹⁴ This is known as Engle and Granger (1987) two step method. In the first step we estimate the equation, $\ln (PE_i)_t = a + b \ln (GDP)_t + e_t$, to establish the long-run relationship between the two variables in the equation and apply unit root test on error term (residue). Two variables are said to be cointegrated if the error term is stationary.

Table 2. Results of Cointegration Analysis.

Equations	NH	AH	Eigen Values	LR Test Statistics	Critical Value#	
					1%	5%
$TPE_{woi}/p=f(GDP/p)$	R=0	r=1	0.6721	27.3229*	30.45	25.32
	R≤1	r=2	0.1189	2.7859	16.26	12.25
$TPE_{wi}/p=f(GDP/p)$	R=0	r=1	0.6765	27.6344*	30.45	25.32
	R≤1	r=2	0.1197	2.8049	16.26	12.25
$TCE/p=f(GDP/p)$	R=0	r=1	0.6113	27.5067*	30.45	25.32
	R≤1	r=2	0.3496	8.6057	16.26	12.25
$PEGS/p=f(GDP/p)$	R=0	r=1	0.7057	29.9591*	30.45	25.32
	R≤1	r=2	0.1291	3.0428	16.26	12.25
$WS/p=f(GDP/p)$	R=0	r=1	0.5570	21.9571*	24.60	19.96
	R≤1	r=2	0.1309	3.2278	12.97	9.24
$OGS/p=f(GDP/p)$	R=0	r=1	0.4747	15.4589*	20.04	15.41
	R≤1	r=2	0.0278	0.6485	6.65	3.76
$TGTR/p=f(GDP/p)$	R=0	r=1	0.3017	8.4802	20.04	15.41
	R≤1	r=2	0.0094	0.2185	6.65	3.76
$PI/p=f(GDP/p)$	R=0	r=1	0.3914	15.6858	30.45	25.32
	R≤1	r=2	0.1692	4.2684	16.26	12.25
$DEF/p=f(GDP/p)$	R=0	r=1	0.3762	13.3036	30.45	25.32
	R≤1	r=2	0.1008	2.4456	16.26	12.25

'r' represents the number of cointegrating relationships and 'p' represents population.

** and * indicate the acceptance of null hypothesis of a unique cointegration vector at 1% and 5% level of significance respectively.

Critical values vary by changing assumptions regarding deterministic trend.

The results support the hypothesis that there are cointegration vectors between TPE_{woi} , TPE_{wi} , $PEGS$, TCE , OGS and WS , and GDP . It implies that there are long run steady state linear relationships among these categories of public expenditure per capita and GDP per capita. In the case of other components of public expenditure such as $TGTR$, DEF and PI , the null hypothesis of no cointegration is not rejected which indicates that these components of public expenditure do not possess a long-run equilibrium relationship with GDP .

5.3 Causality Analysis

On the basis of the above results, to determine the causality among variables, the second step of Engle and Granger's (1987) two-step method is used for those components of public expenditure which have shown long-run relationships with GDP . According to this procedure, the

error term from first step estimation is retrieved and its first lag is used as an independent variable in estimating the following equations.

$$\Delta LX_i_t = \alpha + \sum_{j=1}^m \beta_{ij} \Delta LX_i_{t-1} + \sum_{j=1}^n \gamma_j \Delta LY_{t-1} + \delta e_{t-1} + u_t \dots \dots \dots (4)$$

$$\Delta LY_t = \alpha + \sum_{j=1}^k \gamma_j \Delta LY_{t-1} + \sum_{j=1}^l \beta_{ij} \Delta LX_i_{t-1} + \lambda e_{t-1} + u_t \dots \dots \dots (5)$$

Where Δ is the first difference operator, e_{t-1} is the error correction term, X_i is the various categories of public expenditure per capita and Y is the GDP per capita. The coefficients δ and λ , respectively, are expected to capture the long-run dynamic adjustment of ΔLX_i_t in equation 4 and ΔLY_t in equation 5. The optimal lag length orders of the variables are determined by Akaike Information Criteria (AIC). The results of Granger causality tests are based on the significance of the coefficients of the error correction terms, δ and λ in equation 4 and 5 respectively. When the coefficient δ is significant, it implies that GDP Granger causes public expenditure which verifies Wagner's hypothesis. When the coefficient λ is significant, it implies that public expenditure causes GDP which verifies Keynes' hypothesis.

Alternatively one can run bivariate regressions for all possible pairs of (X,Y) series in a group. Equations for such bivariate regression can be written as follows.

The null hypothesis is that 'X' does not Granger-cause 'Y' in the first regression and that 'Y' does not Granger-cause 'X' in the second regression. The reported F-statistics are the Wald Statistics for the joint hypothesis, $\beta_1 = \beta_2 = \dots = \beta_j = 0$, for each equation. The probability of Wald statistics would provide information regarding one-way, dual or no Granger causality among the variables. The results of pair-wise Granger causality tests are reported in table 3.

Table 3. Causality Analysis (based on bivariate regression)

Causality From \Rightarrow To	Wald Statistics (F – statistics)	Probability	Inference
GDP \Rightarrow TPE _{woi}	4.2174*	0.05	WH holds
TPE _{woi} \Rightarrow GDP	1.9354	0.17	-
GDP \Rightarrow TPE _{wi}	4.4263*	0.04	WH holds
TPE _{wi} \Rightarrow GDP	1.6252	0.21	-
GDP \Rightarrow PEGS _{wot}	17.7973**	0.00	WH holds
PEGS _{wot} \Rightarrow GDP	0.5123	0.48	-
GDP \Rightarrow PEGS _{wt}	6.3595*	0.01	WH holds
PEGS _{wt} \Rightarrow GDP	1.5460	0.22	-
GDP \Rightarrow WS	8.1415**	0.00	WH holds
WS \Rightarrow GDP	0.8591	0.44	-

** and * indicate the rejection of null hypothesis of no Granger causality at 1% and 5% level of significance respectively.

The results of the Granger causality establish a unidirectional causality between various categories of public expenditure (TPE_{woi}, TPE_{wi}, PEGS, TCE and WS) and GDP. It implies that, in the case of North Cyprus, the growth of GDP has Granger caused the growth of total public expenditure with and without interest, public expenditure on government purchases, current expenditure and public expenditure on wages and salaries.

In cases where two variables are not cointegrated, we employ Granger's (1969) causality techniques to test the direction of short run causation. It required estimation of equations 4 and 5 without including error correction terms. The null hypotheses, GDP Granger cause public expenditure if $\gamma_j \neq 0$ and $\beta_{ij} = 0 \forall j$, public expenditure will Granger cause GDP if $\gamma_j = 0$ and $\beta_{ij} \neq 0 \forall j$, and if $\gamma_j \neq 0$ and $\beta_{ij} \neq 0 \forall j$, there would be a bi-directional causality. There results are summarised in table 4.

Table 4. Summary of Short-run Granger-causality Results.

Causality From \Rightarrow To	Dependent Lags	Independent Lags	Inference
GDP \Rightarrow TGTR	1	2	Causality Exist (WH holds)
TGTR \Rightarrow GDP	2	3	No Causality
GDP \Rightarrow DEF	1	2	No Causality
DEF \Rightarrow GDP	1	2	No Causality
GDP \Rightarrow PI	1	2	No Causality
PI \Rightarrow GDP	1	1	No Causality

Table 4 reveals that GDP Granger causes TGTR while GDP does not Granger cause DEF and PI. It means that the growth of GDP causes total government transfers to persons, and businesses. However, the growth of GDP does cause the growth in public investment and vice versa.

5. Policy Implications

The public sector plays a vital role in the economic development of a country particularly in small island economies. However, the literature also provides enough evidence of both either no, or negative, impact of public expenditure on economic growth. For instance, government purchases or public expenditure on goods and services are those that require productive resources to be diverted from private use by individuals and corporations so that they can be used by the government. In this way, the public sector behaves as a competitor of the private sector both at factors and goods markets and thus is likely to crowd-out private investments. Thus excessive use of productive public resources may become unproductive when they are not used carefully¹⁵. A similar situation appears in the case of Northern Cyprus where empirical analysis has shown that GDP Granger causes public expenditure on goods and services. It implies that in the case of North Cyprus, high economic growth would lead to an increase in the growth of public expenditure on goods and services with or without transfers. There might be many explanations of this outcome. First, since the public sector is characterised by high social priority and low rate of return, it does not attract private investment and thus the government intervenes in the provision of public or quasi-public goods and services. Such action not

¹⁵ A similar discussion has been made by Devarajan et. al. (1996) in their article entitled "the composition of public expenditure and economic growth".

only increases the share of the capital component of public expenditure but also raises the amount of the public payroll. Furthermore, the public sector is usually overstaffed and, as a result, a large share of public resources is spent mainly on the salaries and pensions of public employees whose productivity levels are well below that of the private sector. Therefore, these public expenditures become unproductive and the economy fails to get the benefits of public expenditure as expressed by the Keynesian school of thought. Second, public investment can also be blamed on the ground of inefficiencies because of subsidised pricing. It implies that public investment always depends on scarce public resources and hence is a permanent burden on the budget. Third, public investments deplete the financial resources of the country and distort the financial market. As a result, a high interest rate raises the cost of private investment and consequently the return on private capital decreases which crowds out private investment. The above discussion suggests strongly that public expenditure can be used as a policy instrument. Since, Ghafoor and Vadat (2002) reported that the returns on infrastructure and human capital are very low in the case of Northern Cyprus, it is better to use these resources elsewhere. For instance, the same study supports the view that any encouragement of the private sector may contribute to economic growth. It means that a carefully designed fiscal policy requires reshaping the resources allocation in favour of sustainable economic growth.

Public expenditures on transfer of payments are those that redistribute purchasing power among citizens and thus are used as instruments of a stabilisation policy. Although total expenditure on government transfers does not show any long run relationship with GDP, in the short run GDP Granger causes total government transfers. One may conclude that, in case of Northern Cyprus, in the long run, government transfers cannot be used as an instrument of stabilization policy, but their role in short run adjustment cannot be ignored. Historical data on the public expenditure of Northern Cyprus indicates that the total amount of government transfers increased by seven-fold during the period under consideration. As mentioned earlier, it might be an outcome of the early retirement policy of the government. This policy certainly reduced the unemployment problem in the short run, but it caused a long run budget deficit problem because the government not only lost their income tax

revenue but also had to pay for their pensions and other social services. Therefore, the resources flow from GDP to total government transfers in support of Wagner's law. Barro (1990) supports these results by saying that public expenditures on transfers are unproductive and an increase in resources devoted to unproductive activities is associated with lower per capita economic growth. Therefore, the government needs to reconsider its early retirement policy to lower the extra load on the annual budget.

In this study, government expenditure on defence did not show a significant relationship with GDP which means that the government does not pay significant attention to defence expenditure. It may be, however, due to the fact that most of the defence expenditure comes from Turkey directly and is never included in the Northern Cyprus budget. Therefore, the amount shown in the Planning Organization Data book may include the expenditure on police or civil security forces. It implies that defence expenditure does not show any competition with social sector expenditure in the government budget and thus has no impact on fiscal policy.

Conclusions

The present study is an attempt to investigate whether the growth in various components of public expenditure possesses any long-run relationship with the growth in GDP in the case of Northern Cyprus. It further identifies the direction of causation between components of public expenditure and GDP to verify Wagner's and Keynes' hypotheses. The study uses Philips and Perron's (1988) method to test stationarity and to determine the order of integration. Results conclude that all series are stationary at first difference and thus are integrated of order one, i.e., I(1). The Johansen full information maximum likelihood (ML) method was used to find out possible cointegration vectors in all equations. Results conclude that some components of public expenditure (total public expenditure with and without interest, expenditure on goods and services, total current expenditure and wages and salaries) are cointegrated with GDP. It means that these components of public expenditure have a long run steady state linear relationship with economic growth. Finally, Engle and Granger bivariate regressions analysis was used to identify the direction of causality in those variables which have shown long run relationships with GDP. Results identify a unidirectional causal relationship between the above-mentioned component of public

expenditure and GDP and thus confirm Wagner's law. For all other variables (total government transfers, public investment and expenditure on defense), which were not cointegrated with GDP, Granger's (1969) causality procedure was used. Results reveal that GDP Granger causes total government transfers while there is no causal relationship between public investment and expenditure of defense and GDP.

Empirical evidence on the causality relationship between expenditure on government purchases and GDP implies that scarce public resources should be used very carefully particularly in the case of Northern Cyprus where elasticity of public expenditure is very small and insignificant. In this situation, excessive use of scarce public resources would become unproductive. Therefore, a carefully designed fiscal policy is required to lead economy at sustainable growth track. Although, government transfers do not show a long run relationship with GDP, unidirectional causality from government transfer to GDP implies that reshaping government transfers can help in establishing better stabilization policies.

The paper reaches the following conclusions. First, the study confirms Wagner's law in the case of Northern Cyprus, which means that the growth in total and various components of public expenditure followed the pattern of GDP growth in the past. Second, the existence of long run relationships between GDP and total public expenditure, government purchase and current public expenditure offer significant policy implications. Finally, the study confirms that Ram's idea of inclusion and exclusion of transfer of payments in government purchase does not make any significant change in empirical results.

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