

## INTERLINKAGE BETWEEN PUBLIC EXPENDITURE AND ECONOMIC GROWTH IN INDIAN CONTEXT

AMAN BISHNOI

Research Scholar, Department of Commerce, Himachal Pradesh University Shimla (HP)

AVINASH KAUR

Assistant Professor, Department of Commerce, Punjabi University Patiala (Punjab)

### ABSTRACT

The study aimed to explore the impact of expenditure on economic growth in India for the period from 1970-71 to 2017-18. The secondary data was collected from the Handbook of Statistics on Indian Economy published by Reserve Bank of India, Mumbai. Augmented Dickey Fuller (ADF) test was applied to check the stationarity of data. After checking stationarity, Johansen Co integration and Granger Causality Test were applied to empirically investigate the relationship between the selected variables i.e. public expenditure and economic growth (Gross Domestic Product) in India. The Co integration results indicated that there is no relationship in the long run among economic growth and expenditure. Similarly, the pair wise granger causality test indicated that no causal relationship existed between economic growth and expenditure. Therefore, this empirical research reveals that during the study period neither Keynesian nor Wagnerian hypothesis is supported in India. In other words, there existed no causal relationship between economic growth and expenditure and vice-versa.

**KEYWORDS:** Wagner's Law, Government Expenditure, Economic Growth, Johansen's Co-integration Test.

### INTRODUCTION

Public expenditure is an indispensable instrument for the government to control the economy. Public expenditure plays a crucial role in the smooth functioning of any economy. It is a vital tool of fiscal policy. Public expenditure includes all the expenses made by the government for socio-economic welfare for the equitable development of society and the economy as a whole. The motive of public spending is the allocation of scarce resources and maximization of welfare. Past years witnessed that public expenditures have played a major role in physical and human capital formation. The traditional objective of government expenditure was to exercise it as an instrument of state policy to preserve a region by providing law, order and justice (Rehman Sobhan, 1993). Appropriate public expenditure has been considered as an effective means in promoting economic growth. Thus, government expenditure even of a recurrent nature, can contribute positively to economic growth (Chude and Chude, 2013). Many studies have highlighted that increase in government expenditure can be considered as an effective tool to enhance aggregate demand for a stagnant economy. The predominant objective of public expenditure policy is undoubtedly sustained and equitable economic growth.

The causality between public expenditure and economic growth has been an enduring matter in economics. The available literature on the causal effect relationship between the public expenditure and economic growth reveals the emergence of two schools of thought which claims two different views. These two approaches are- first, Wagner's Law approach which states that national income

causes public expenditure and second, Keynesian approach which states that public expenditure causes national income. . Wagner's Law and Keynesian theory presents two opposite viewpoints on the causal effect relationship between public expenditure and economic growth.

Thus, Wagner (1883) stated that economic growth as the fundamental determinant of public sector growth and Keynes (1936) emphasized public expenditure as a fundamental determinant of economic growth. According to Wagner's hypothesis there is a positive relationship between economic growth and public expenditure, thus it can be said that causality runs from economic growth to government spending. Keynesian theory, however, emphasized the role of government in the economy especially in the period of economic depression, that is, causality runs from government expenditure to national income. While according to Wagner's law causality runs from growth in community output to public expenditure, the Keynesian approach assumes that causality runs from public expenditure to growth in community output. (Bagdigen and Cetintas, 2003).

The numerous studies relationship between government expenditure and economic growth depicts conflicting results theoretically as well as empirically. Several empirical pieces of research have been conducted to investigate the existence of Keynesian and Wagner's Hypothesis in the countries around the world and all these studies have given contradicting results depending upon country to country and time period of the study. In Nigeria, Olomola (2004) revealed the existence of Wagner's hypothesis both in short as well as long run. Jelilov and Musa (2016) also revealed government expenditure had a significant and positive impact on economic growth in Nigeria for the time span of 1981-2012. In Turkey, no empirical support for Wagner's Law was found in the studies conducted by Demirbas (1999) for 1950-1990 time period or by Bagdigen and Centinas (2003) for 1965-2000. In case of Pakistan, research carried out by Muhammad et al (2015) for 1972 to 2013 period and Afzal & Abbas (2010) for the period 1960 to 2007 refuted the existence of Wagner's Law; whereas Iqbal and Rehman (2010) support the Wagner's Law but refuted the existence of Keynesian Hypothesis for the period 1971 to 2006. Similarly, endeavor has been made to investigate the validity of Wagner's Law in Indian economy. The studies conducted by Verma & Arora (2010), Kaur & Afifa (2017) and Sharma & Singh (2019) strongly support the existence of Wagner's Law; whereas the studies carried out by Singh and Sahni (1984), Bhat et al (1991) and Mohsin et al (1995) refuted the existence of Wagner's hypothesis.

## REVIEW OF LITERATURE

Many studies have been carried out in countries around the world to investigate the Keynesian and Wagners's hypothesis. Some of these are given below:

Ghani and Din (2006) explored the role of public investment in the process of economic growth in Pakistan. The results revealed that growth is largely driven by private investment and that no strong inference can be drawn from the effects of public investment on economic growth. Afzal and Abbas (2010) made an attempt to test the validity of Wagner hypothesis in Pakistan for the time period from 1960 to 2007. The results of the study revealed that there existed unidirectional causality that there fiscal deficit and public spending. The study further showed that income and fiscal deficit also have unidirectional causality. On the other hand, there existed no causality between income and public spending. Usman et.al (2011) investigated the effect of federal government expenditure on economic growth in Nigeria for the period between 1970 to 2008. The results of the OLS showed the expenditure on administration, education and transport & communication have negative impact of economic growth in the short run. On the other hand, expenditure on health and other services and FDI have positive impact on growth. Odhiambo (2015) examined the casual relationship between government expenditure and economic growth in

South Africa. The study found that government expenditure and economic growth granger cause each other in short run; whereas in the long run economic growth granger causes government expenditure. Jelilov and Musa (2016) investigated the impact of government expenditure on economic growth in Nigeria for the time span of 1981-2012. The study found that Government expenditure has a positive and significant impact on economic growth. Ray et al (2019) made an attempt to study the causal relationship between public expenditure and economic development in India from 2003 to 2015. The study found that causal flow existed from real sector growth to increase in public expenditure in developed and less developed states; whereas in case of least developed states there existed bidirectional causality between both capital and revenue expenditure and from growth to capital and revenue expenditure.

### Summary of Empirical Literature

Author(s) and Year of Study	Location of Study	Topic	Variables of the model	Methodology	Findings
Singh and Sahni (1984)	India (1950-1981)	Causality between Public Expenditure and National Income	Public Expenditure and National Income	Granger Causality Test	The results revealed that the causality between Public Expenditure and National Income is neither Wagnerian nor Keynesian.
Ghani and Din (2006)	Pakistan (1973 to 2004)	The impact of Public Investment n Economic Growth in Pakistan	Public investment, private investment, public consumption and GDP	Vector Autoregressive (VAR) model	The results revealed that growth in largely driven by private investment and that no strong inference can be drawn from the effects of public investment on economic growth.
Srinivasan (2013)	India (1973-2012)	Causality between Public Expenditure and Economic Growth: The Indian Case	Public Expenditure and Economic Growth	Johansen Cointegration and Vector Error Correction Model	Indicated one way causality runs from economic growth to public expenditure in the short run and long run.
Ageli (2013)	Saudi Arabia (1970-2012)	Wagner's Law in Saudi Arabia 1970-2012: An Econometric Analysis	Government Expenditure and Economic Growth	Ordinary Least Square (OLS), Co-integration Test and Error Correction Model	The study revealed the existence of strong causality for all the Wagner's Law versions in the long run.
Ebaidalla (2013)	Sudan (1970-2008)	Causality between Government Expenditure and National Income: Evidence from Sudan	Real GDP and real total government expenditure	Granger Causality Test and Error Correction Method	The results indicated that the direction of causality running from government expenditure to national income, both in the short and long run.
Usman et al (2014)	Nigeria (1970-2008)	Public Expenditure and Economic Growth in Nigeria	Domestic Capital, Foreign Capital inflow and Public	Johansen Cointegration and Vector Error Correction	The results showed that there existed long run relationship between public expenditure and growth.

Muhamma d et al (2015)	Pakistan (1972-2013)	Impact of Expenditure on Economic Growth in Pakistan	Public Expenditure and Economic Growth (GDP)	Johansen Cointegration and Granger Causality Test	The results indicated that there existed no relationship between expenditure and national income in the long run.
Kaur (2017)	Rajasthan (India) (1970-71 to 2013 - 14)	Causality between Public Expenditure and Economic Growth in Rajasthan	Public Expenditure and Economic Growth	Kinked Exponential Growth Function, Engle Granger Technique and Vector Auto Regressive	The study found that there was cointegration or rather co-movements between government expenditure and economic growth measured in terms of NSDP in real terms in Rajasthan.
Ray et al (2019)	Indian states (2003-2015)	Public Expenditure and Economic Development - Regional Analysis of India	Economic Development and Public Expenditure	Panel Unit Root, Panel Co - integration and Toda Yamamoto Causality Test	The study found that causal flow existed from real sector growth to increase in public expenditure in developed and less developed states; whereas in case of least developed states there existed bidirectional causality between both capital and revenue expenditure
Sharma and Singh (2019)	India (1988-2017)	The Validity of Wagner's Law in India: A Post Liberalisation Analysis	Government Expenditure, Gross Domestic Product and Urbanisation	Johnansen Co-integration, Vector Error Correction Model and Granger Causality	The study found that Indian economy supports Wagner's Law in the long run.

Source: Author's Compilation.

### OBJECTIVE OF THE STUDY

The objective of the study is to ascertain the impact of government expenditure on economic growth in India for the period from 1970-71 to 2017-18.

For the purpose of the study, this hypothesis is formulated:

$H_{01}$  = There is no causal relationship and unidirectional causality between public expenditure and economic growth and in India.

$H_{11}$  = There is no causal relationship and unidirectional causality between public expenditure and economic growth and in India.

Explanation: Keynesian theory of Public expenditure asserts that government expenditure causes economic growth. The causality between public expenditure and economic growth are found to be unidirectional from public expenditure to economic growth.

$H_{02}$  = There is no causal and unidirectional causality between economic growth and public expenditure.

$H_{12}$  = There is causal and unidirectional causality between economic growth and public expenditure.

Explanation: Wagner's Law states there is positive relationship between economic growth and government expenditure. Thus, it clearly means that there is unidirectional causality from economic growth to government expenditure.

In this study, the annual time series data of the two variables namely, Gross Domestic Product (GDP) and the Public Expenditure of India, have been carried out for the time span from 1970-71 to 2017-18. The real Gross Domestic Product is used as the proxy for economic growth in India. The total expenditure of the central government has been considered as the public expenditure for the considered for public expenditure under the study. All the data required for the purpose of study have been collected from various issues of Economic Survey of India and Handbook of Statistics on Indian Economy published by Reserve Bank of India, Mumbai.

### UNIT ROOT TEST

The first condition is to test stationary for time series data. Augmented Dickey Fuller Test and Phillips Perron test are used to check whether the data is stationary or non-stationary. The variables selected for the study are first converted into natural logarithm before applying Augmented Dickey Fuller Test and Phillips Perron Test. In Augmented Dickey Fuller (ADF) test, lag length has been determined using Schwarz Information Criterion (SIC). However, in Phillips Perron (PP) test, Barlett Kernel (by default) spectral estimation method and Newey West band width (automatic selection) has been applied. If the series has a unit root, this indicates that series is non-stationary. If the series is found to be stationary in levels they are considered integrated of order zero,  $I(0)$  or if they found to be non-stationary and have a unit root and are thereafter integrated of order  $d$ ,  $I(d)$ ;  $d$  here denotes the number of times the variable has to be first differenced in order to make it stationary. If the series are non-stationary in levels, but stationary in differences; then there is a chance of co integration relationship between them which reveals the long run relationship between the series. In the present study, stationary is checked by graphic method and unit root test.

For empirical analysis of long run relationship between Economic growth (LnGDP) and Expenditure (LnEXP), Johenson Co integration and Granger Causality Test have been applied. Johenson Co integration Test has been used to know the long run relationship among the selected variables. Granger causality test is used to check the casual relation among the variables of the study.

### GRANGER CAUSALITY TEST

Following model is proposed for Granger Causality Test:

$$\text{LnGDP}_t = \beta_0 + \sum_{j=1}^n \beta_1 \text{LnGDP}_{t-j} + \sum_{j=1}^n \beta_2 \text{LnEXP}_{t-j} + \mu_t$$

$$\text{LnEXP}_t = \lambda_0 + \sum_{j=1}^n \lambda_1 \text{LnGDP}_{t-j} + \sum_{j=1}^n \lambda_2 \text{LnEXP}_{t-j} + v_t$$

Where,  $\text{LnGDP}_t$  stands for Natural Logarithm of Public Expenditure

$\text{LnEXP}_t$  = Natural Logarithm of Gross Domestic Product

$\mu_t$  &  $v_t$  denotes Error terms

## DATA ANALYSIS AND RESULTS

The secondary data collected was processed and analyzed by using Eviews 8 software. Figure 1 presents the graphical presentation of LNGDP and LNEXP, it is revealed that mean and variance of both these series do not remain constant over the study period. Thus, the logged values have unit root, that is, both these variables are non stationary at level.

**Figure 1**  
**Graphical Presentation of Logged GDP and EXP**

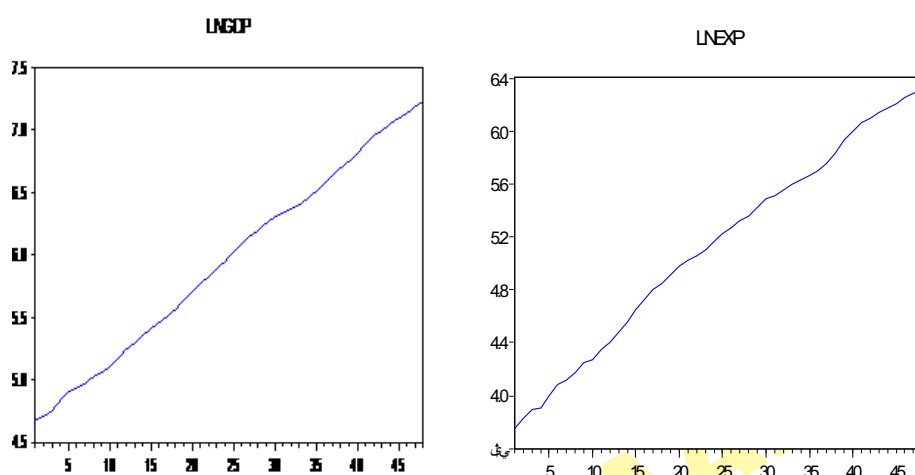


Table 1 shows the results of Augmented Dickey Fuller (ADF) test for public expenditure (EXP) and Gross Domestic Product (GDP). The variables are transformed into natural logarithms denoted by LN. The variables LNGDP and LNEXP are non stationary at level. However, these variables became stationary after first difference in both unit root tests. Hence, the null hypothesis of non stationary for the selected variables is rejected at first difference at 5 percent level of significance.

**Table 1: Unit Root Tests**

Variable	Augmented Dickey Fuller Test		Phillips Perron Test	
	Intercept	Trend and Intercept	Intercept	Trend and Intercept
LnGDP	-2.926622 (0.8507)	-3.510740 (0.3415)	-2.794187 (0.9457)	-3.508508 (0.4386)
LnEXP	-2.925169 (0.1134)	-3.219652 (0.9463)	-2.516964 (0.1790)	-3.529598 (0.9158)
At First Difference				
$\Delta$ LnGDP	-2.926622* (0.0001)	-3.552973* (0.0023)	-2.874624* (0.0003)	-3.560869* (0.0024)
$\Delta$ LnEXP	-2.951125* (0.0000)	-3.548490* (0.0001)	-2.793423* (0.0000)	-3.570389* (0.0001)

\*significant at 5 percent level.

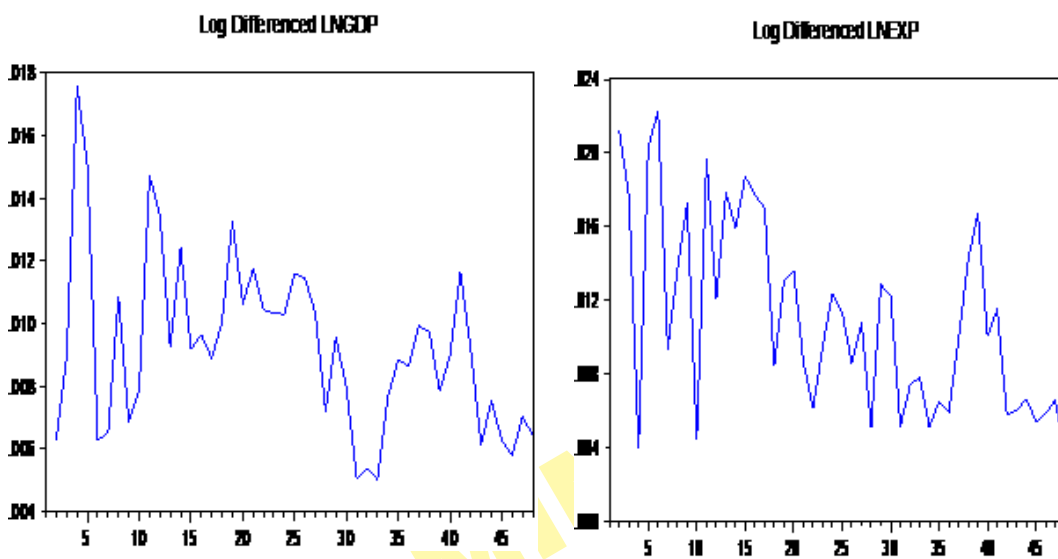
$\Delta$  = First Difference

Values in parenthesis are p- values for ADF and PP tests.

Figure 2 shows the differenced log (dlog). It is observed that these series become stationary because their means and variance are not changing much over the study period. Therefore, it is evident from graph that both are integrated of order 1[I (1)].

Figure 2

Graphical Presentation of Differenced Log GDP and Log EXP



Johansen's Co integration test was carried to examine the long term relationship between the public expenditure and Gross Domestic Product. Its results are presented in Table 2. Table shows that as the trace statistics is less than critical value, null hypothesis cannot be rejected. Thus, it is concluded that these two variables are not integrated.

Table 2: Trace Statistics

Hypothesized Number of Cointegration	Eigen Value	Trace Stats	Critical Value (5%)	Prob.
None	0.1158	10.5851	15.4947	0.2384
At most 1*	0.1015	4.9238	3.8414	0.0265

Note: values are rounded off to four figures after decimal.

\*denotes rejection of the hypothesis at the 0.05 level.



Table 3 shows the maximum eigen value. It is observed from the results that null hypothesis cannot be rejected because max eigen value is less than critical value; thus it is clear that the selected variables does not have long run relationship among each other.

**Table 3: Maximum EigenValue**

Hypothesized Number of Cointegration	Eigen Value	Trace Stats	Critical Value (5%)	Prob.
None	0.1158	5.6612	14.2646	0.6570
At most 1*	0.1015	4.9239	3.8414	0.0265

Note: values are rounded off to four figures after decimal.

\*denotes rejection of the hypothesis at the 0.05 level.

The table 4 shows the Pairwise Granger Causality test. Pairwise Granger causal test result shows that there existed no causality between LnGDP and LnEXP in India during the study period. Thus, it is inferred from the results that in India Wagner's Law and Keynesian Law are not applicable during the study period. However, the results are supported by the many other studies such as Musgrave (1969), Shams and Murad (2009) for Bangladesh, Ju Huang (2013) for Taiwan China and Muhammad et al (2015) for Pakistan. Similarly, the research conducted by Sharma and Singh (2019) for the period 1980-2017 highlighted that the causality does not exist between Gross Domestic Product (GDP) and Government Expenditure. The results of pair wise granger causality test revealed that variables namely; Public Expenditure and Gross Domestic Product, are independent of each other.

**Table 4: Pairwise Granger Causality Test**

Null Hypothesis (H <sub>0</sub> )	Observations	F-stats	P-value
LNGDP does not Granger Cause LnEXP	46	3.12450	0.0546
LNEXP does not Granger Cause LnGDP		2.60449	0.0861

Note: at lag 2.

## CONCLUSION

The research aimed to investigate the impact of expenditure on economic growth in India. The variables selected for the purpose of study were Gross domestic Product (LNGDP) and Public Expenditure (LNEXP). These variables were initially non-stationary so, they were transformed into stationary by taking them at first difference. After that, Johansen Co integration test was carried out and the results revealed that there is no relationship in long run among economic growth and expenditure. Similarly, pair wise granger causality test indicated that no causal relationship existed between economic growth and expenditure. Thus, the null hypothesis set for the study cannot be rejected. Therefore, this empirical research reveals that during the study period neither Keynesian nor Wagnerian hypothesis is supported in India. In other words, there existed no causal relationship between economic growth and expenditure and vice-versa. The study concluded that in order to achieve economic growth public expenditure is not an important



tool.

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