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Bi-Directional Causal Relationship Between Economic Growth and Growth of Public Expenditure in India

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ABSTRACT

This paper tries to investigate Bi-directional causal relationship between Economic Growth and Growth of Public Expenditure in India during the Post Economic Reforms period from 1992 to 2012. First, impact of Economic Growth on Public Expenditure is investigated and then influence of Public Expenditure on Economic Growth is examined during 1992 to 2012. Here in this study cross-sectional relationship is estimated between year-wise National Income (GDP) and Public Expenditure in India, for the study years 1992 to 2012. Cross-sectional analysis of data from 21 years during 1992 to 2012 of India showed significant Bi-directional causal relationship between year-wise number of National Income (GDP) and Public Expenditure.

KEYWORDS : Bi-directional, Causal Relationship, Economic Growth, National Income, Gross Domestic Product, Public Expenditure.

INTRODUCTION

The study of causal relationship between Economic Growth and Public Expenditure has attracted the interest of many economists and policy makers for a very long period of time in world as a whole, both at theoretical and empirical levels. In most of the developed and developing countries the debate is going on about causal relationship between Economic Growth and Growth of Public Expenditure. It is very important to investigate if there is any Bi-directional causal relationship between these two variables Economic Growth and Public Expenditure.

Wagner's hypothesis suggests that Growth in Public Expenditure plays no crucial role in Economic Growth, i.e. increase in Public Expenditure does not increase National Income. In Keynesian view, increase in Public Expenditure increases National Income and leads to Economic Growth.

Wagner (1883) predicted that Economic Growth i.e. increase in National Income, would increase Public Expenditure. Thus, the causality according to Wagner's law is running from economic growth to public expenditure i.e. increase in National Income to increase in Public Expenditure. On the other side, Keynesian hypothesis support that the causality is running from Public Expenditure to Economic Growth i.e. increase in National Income, which is in contrast with Wagner's law.

Interest for the Wagner and Keynesian hypothesis attracted the attention of many economists after the translation of the original work of Wagner by Cooke (1958), and Publication of Keynes' General theory of Employment, Interest and Money (1936). However, the increased Public Expenditure in most countries, new development of econometric techniques, and the last translation of Wagner's work by Biehl (1998) attracted again the interest of many policy makers and economists.

Our study is for Post Economic Reforms period from 1992 to 2012. After New Economic Reforms in India in 1990-91 due to Globalization and Liberalization many changes have occurred and National Income and Public Expenditure have expanded. Therefore investigation of Bi-directional causal relationship between Economic Growth, i.e. increase in National Income and Public Expenditure is very important.

The remainings of the paper is organised into nine sections including earlier introduction. Section two presents theoretical foundation of the study, Section three describes the objectives of study, Section four is about hypotheses, and Section five describes methodology and model specification. Section six, is about sources of data, Section seven, reviews literatures. The empirical findings are reported in Section eight, Section nine presents conclusion.

2 THEORETICAL FOUNDATION

Economic Growth means increase in real National Income of the country over a long period of time. This increase in National Income enables the country to increase Public Expenditure for the welfare and higher standard of living of the people Some Economists like Wagner argue that increase in Economic Growth leads to increase in Public Expenditure. Thus, Economic Growth is independent variable and Growth of Public Expenditure is dependent variable. Economic Growth is the cause and Public Expenditure is the effect. Different Economists have different feelings about study of impact of National Income on Public Expenditure. Wagner expounded that the "Law of increasing expansion of public and particularly state activities" which is referred to as the "Law of increasing expansion of fiscal requirements". The Law suggests that the share of the public sector in the economy will rise as economic growth proceeds, owing to the intensification of existing activities and extension of new activities. According to Wagner, social progress has led to increasing state activities with resultant increase in Public Expenditure.

As against this some Economists like Keynes, believe that increase in Public Expenditure increases National Income which gives rise to Economic Growth. Keynes has propounded only one theory i.e., the theory of Public Expenditure (theory of investment), which made him the greatest economist of the 20th century. This is the pivotal theory around which all theories are developed by Keynes' cluster. In other words, all the economic doctrines are the direct offshoot of the theory of investment. The theory of government expenditure was proved to be more successful in fighting the ill effects of Great Depression. According to Keynes increase in Public Expenditure, i.e. increase in Investment in Public Sector increases National Income in multiplier way. Thus, according to Keynes, Public Expenditure is independent variable and increase in National Income is dependent variable.

Thus, Wagner's law and the Keynesian theory present two opposite perceptions in terms of the relationship between Public Expenditure and Economic Growth. While according to Wagner's approach causality runs from Economic Growth to Public Expenditure and the Keynesian approach assumes that causality runs from Public Expenditure to Economic Growth. Actually both the perceptions are valid in case of India after the period of 1992 to 2012.

Thus, it becomes necessary to investigate Bi-directional causal relationship between Economic Growth and Growth of Public Expenditure. In this study we have find out that both Economic Growth and Public Expenditure influence each other. Both Economic Growth and Public Expenditure are interdependent and exogenous and endogenous to each other in India.

3 OBJECTIVES OF THE STUDY

Many studies have been made on effect of Economic Growth on Growth of Public Expenditure and also on influence of Public Expenditure on Economic Growth. But very few studies are made on Bi-directional causal relationship between Economic Growth, i.e. National Income (GDP) and Public Expenditure in whole world. Therefore, the main objective of this paper is to investigate Bi-directional causal relationship between Economic Growth, i.e. National Income (GDP) and Public Expenditure in India. We want to empirically investigate the effect of Economic Growth, i.e. increase in National Income (GDP) on Public Expenditure and influence of Public Expenditure on Economic Growth in India during 1992 to 2012.

4 HYPOTHESES OF THE STUDY

The present paper aims at determining empirical Bi-directional causal relationship between Economic Growth and Public Expenditure in India. We have the following important hypotheses:

(1) There is Bi-directional causal relationship between Economic Growth and Growth of Public Expenditure.
(2) Economic Growth, i.e. increase in National Income (GDP) has increased Public Expenditure in India. Economic Growth is exogenous and Public expenditure is endogenous.
(3) Growth of Public Expenditure, has led to Economic Growth, i.e. increase in Public Expenditure has increased National Income (GDP) in India. Public Expenditure is exogenous and Economic Growth is endogenous.

5 METHODOLOGY OF ANALYSIS

In this paper, empirical analysis is undertaken with a view to establish cross-sectional Bi-directional causal relationship between Economic Growth, i.e., National Income (GDP) and Public Expenditure in India for the period from 1992 to 2012 by using computer software (E-views). This has been carried out with the help of year-wise secondary data.

This paper has been designed so as to examine the hypotheses as mentioned earlier in this study.

Here, statistical regression model is employed as a tool for the analysis of relationship between the variables which we are predominantly concerned with. The dependent variable in Model-1 is the year-wise Public Expenditure (in Rs. Crores) over 21 years in India. On the other hand, the independent variable is National Income (GDP) at constant prices. In Model-II the dependent variable is the year-wise National Income (GDP) (in Rs. Crores) at constant prices and independent variable is Public Expenditure (in Rs. Crores)

We have estimated two variable models and then fitted double natural logarithmic (log) equations below with the corresponding statistical values of student's t-statistics, R2, R2, F-value, D-W Statistics and the regression coefficients.

6. SOURCES OF DATA

The sources of data are exclusively built on secondary survey. The required statistical data are collected from various sources, and have been used for analysis purpose, and they are from the following sources:

(1) Reserve Bank of India (RBI), CSO.
(2) Economic and Financial statistics Review (Reserve Bank of India)
(3) Indian Economic Survey (Fiscal and Real Sector), the Ministry of Finance, "Government of India" New Delhi.

And also data collected from other reliable sources.

7 REVIEW OF LITERATURE

Many studies have been carried out in India and abroad which are of greater significance. Among a few significant studies on impact of National Income (GDP) on Public Expenditure and effects of Public Expenditure on National Income, we have reviewed following works:

Singh and Sahni (1984), studying the causality link between Public Expenditure and National Income for India during the period 1950 to 1981, found that the effect of the Growth of Public Expenditure on that of National Income is relatively low if compares to its effect on the Growth of Public Expenditure. They have found out that Public Expenditure and National Income have a Bi-directional causal relationship but their empirical evidence suggest that there is no Bi-directional causal relationship between Economic Growth and Public Expenditure.

Sideris (2007) investigates the long-run tendency for government expenditure to grow relative to national income using Greek data from 1833-1938. Cointegration analysis proves the existence of long run relationship between the National Income and Government Expenditure.

Ansari et al. (1997) test the Income Expenditure hypothesis for three African countries (Ghana, Kenya and South Africa) from 1957-1990. For all these countries a long run relationship between Government Expenditure and National Income cannot be established. Actually during this period Government Expenditure has no relation with National Income. Only in Ghana increase in Government Expenditure is caused by increase in National Income, which supports Wagner's hypothesis. The authors did not find any evidence of Government Expenditure causing National Income. It means Keynesian proposition is not supported by findings

Dogan and Tang (2006) studied the direction of causality between aggregate income and Public Expenditure for Philippines, Indonesia, Malaysia, Singapore and Thailand for the period 1965 to 2005. They have used cointegration method to analyse causal relationship between real GDP per capita and real public expenditure per capita. Their empirical evidence shows the existence of a long run relationship between variables only for Indonesia. But for Philippines they found causality running from expenditure to income. For the other four countries public expenditure does not have any influence on Economic Growth.

Though this is not an exhaustive survey of the literature that has gone into this area, we feel that it does provide analytical framework for enabling us to undertake the present study.

8 RETSULS AND DISCUSSION

In this chapter, the cross-sectional data of National Income (GDP) and Public Expenditure in India for the study years 1992 to 2012 is estimated by fitting the double natural logarithmic (Log) relationship. In this study, there are Two Models. In Model-I, year-wise total number of National Income (GDP) i.e. Economic Growth, is independent variables and Public Expenditure is dependent variable. In Model-II, year-wise total number of Public Expenditure is independent variables and National Income (GDP) i.e. Economic Growth, is dependent variable. We have obtained the following results by examining the Bi-directional causal relationship in both the Models.

8.1 TWO VARIABLES REGRESSION MODELS

Regression estimates as mentioned earlier in this chapter for period from 1992 to 2012 is presented with Two Variables Regression Model with both dependent and independent variables in natural logarithmic (Log) equations below one after another in both the Models, Model-I and Model-II

8.1.1 Model-I

Dependent Variable: Public Expenditure (PEX)
Independent Variable National Income (GDP):
Model: Log PEX = a + b1 Log GDP + Log PEX t-1 + u1
Where PEX stands for Total number of Public Expenditure year-wise and GDP stands for Total number of National Income (Gross Domestic Product) year-wise. And u1 stands for error terms.

Regression results: (For 1992 to 2012 data)
Log PEX = -3.052334611 + 0.3963004646 log GDP + 0.8110100985 log PEX t-1 + u1
(-1.814244) (1.710133)* (6.045565)
R2 = 0.98 Adj.R2 = 0.98 F = 671.8380 DW = 1.82
*** Significant at 5% level of significance**

The above regression results support the fact that the relationship between National Income (GDP) and Public Expenditure is significant and positive as shown by the student's t-values attached to it. The slope signifies that for the study years 1992 to 2012, year-wise number of National Income (GDP) has positive influence on the determination of Public Expenditure year-wise. Coefficient of "National Income (GDP)" also indicates that for Rs. 1 crores changes in the "National Income (GDP)", the "Public Expenditure" would change by Rs. 0.3963 crores. R2 is significant which shows that year-wise number of "National Income (GDP)" is an important factor and explains 98% of variations in Public Expenditure. F-value is highly significant which shows positive relationship between the variables for the whole result. Thus, National Income (GDP) actually has positively influenced Public Expenditure. D-W statistics indicates almost absence of auto-correlation among the residuals.

From the above analysis, we can conclude that the National Income is significant and has positive influence on Public Expenditure in India. This regression results confirm to our Hypothesis No.2 as stated earlier in this paper.

8.1.2 Model-II

Dependent Variable: National Income (GDP)
Independent Variable: Public Expenditure (PEX)
Model-II: Log GDP = a + b1 Log PEX + Log GDP t-1 + u1
Where, GDP stands for Total number of National Income and PEX stands for Total number of Public Expenditure year-wise. And u1 stands for error terms.

Regression results: (For 1992 to 2012 data)
Log GDP = 0.2794467291 + 0.01302032037 log PEX +

0.9721022054 log GDP t-1 + u1
(0.263229) (0.186957)* (6.996257)
R2 = 0.99 Adj.R2 = 0.99 F = 2353.122 DW = 1.99
*** Significant at 5% level of significance**

The above regression results supports the fact that the relationship between Public Expenditure and National Income (GDP) is significant and positive as shown by the student's t-values attached to it. The slope signifies that for the study years 1992 to 2012, year-wise number of Public Expenditure has positive influence on the determination of National Income (GDP) year-wise. Coefficient of "Public Expenditure" also indicates that for Rs. 1 crore changes in the "Public Expenditure" would change National Income (GDP) by Rs. 0.01302 crores. R2 is significant which shows that year-wise number of "Public Expenditure" is an important factor and explains 99% of variations in National Income (GDP). F-value is highly significant which shows positive relationship between the variables for the whole result. Thus, Public Expenditure actually has positively influenced National Income (GDP). D-W statistics indicates almost absence of auto-correlation among the residuals.

From the above analysis, we can conclude that the Public Expenditure has significant and positive influence on National Income (GDP) in India. This regression results confirm to our Hypothesis No.3 as stated earlier in this paper.

9 CONCLUDING REMARKS

Our results of Regression Analysis of Model-I reveal that National Income (GDP) in India has significant and positive influence on the determination of Public Expenditure for the study years 1992 to 2012.Thus our analysis supports our Hypotheses No. 2 as stated in the paper. Our results of Regression Analysis of Model-II reveal that Public Expenditure in India is also an important determinant of National Income (GDP) i.e. Economic Growth in India. This analysis also supports our Hypothesis No.3 as stated in the paper. Thus, both National Income (GDP) i.e. Economic Growth and Growth of Public Expenditure are interdependent and therefore there is a Bi-directional causal relationship between Economic Growth and Growth of Public Expenditure. Both these variables are exogenous as well as endogenous to each other. Our Empirical results show that in our Model-I in which, Economic Growth is independent variable, R2 is 0.98 and D-W is 1.82 and in Model-II R2 is 0.99 and D-W is 1.99 in which Public Expenditure is independent variable. It proves that there is Bi-directional causal relationship between Economic Growth and Growth of Public Expenditure. But in case of India Public Expenditure is more important determinant of Economic Growth as here R2 is 0.99 and D-W is 1.99 and Economic Growth i.e., National Income(GDP) is less important in determination of Public Expenditure as here R2 is 0.98 and D-W is 1.82

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