ISSN 2454-5597

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ISFIRE WORKING PAPER SERIES

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Working Paper-17
http://iire.in/ojs/index.php
Issue-December 2015

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WAGNER'S HYPOTHESIS: AN EMPIRICAL VERIFICATION

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Abstract

The study explores the relationship between Public Expenditure (PE) and Gross domestic product (GDP) to verify whether the Wagnerian law holds good in the Indian context, for. The Study covers the period from 1970 to 2013 and it uses econometric tool like Autoregressive Distributed Lag Model (ARDL) test to check the long run and causal relationship among the variables. The results of the bounds test suggest that there exists cointegration between PE and GDP, but found weak evidence for Wagner's hypothesis.

Keywords: Wagner's Law, Bounds test, Cointegration, Error correction, Public Expenditure and GDP.

JEL Codes: E6, H5, H50, O10, C32.

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1. INTRODUCTION

In case of developing countries public expenditure plays a significant role, it is used not only to ensure economic stability but also to generate employment opportunities and accelerate economic growth and development. It plays a vital role in alleviating mass poverty and reducing the severity of income inequality and some other elementary problems as mentioned below:

1. To build economic overheads, *e.g*., roads, railways, irrigation, power *etc.* Similarly undertaking of social overheads such as hospitals, schools, *etc*. Both of these help to boost growth and development of the economy.
2. To get balanced regional growth by channelizing economic resources in a proper way. Consequently, helping in sorting out the problem of regional imbalances of the economy.
3. To develop mineral resources such as agriculture and industry, *etc*.

The role of Public Expenditure is much more important in the case of developing countries as compared to developed ones with respect to the distribution of economic resources to achieve social optimum. Since 19^{th} century several attempts have been made to analyze the nature, significance and scope of the Public Expenditure that later on got developed into theories of public expenditure in the literature of public finance. Some main theories are such as Adolf Wagner's Hypothesis, Wiseman-Peacock Hypothesis, Musgrave and Rostow's Developmental model and Colin Clark's critical limit hypothesis. The present study is confined to studying the Adolf Wagner's Hypothesis.

1.1 Wagner's Hypothesis: A Theoretical Aspect

According to Wagner, "there are inherent tendencies for the activities of the different layers of the government (such as central and state government) to increase both extensively and intensively". More clearly there is a functional relationship between the growth of an economy and the growth of the government activities (Bhatia, H. 2011).

Wagner was one of those who realized the positive correlation between level of economic development and the size of the public sector. Though he was not the first person to state this relation but he was the first one who attempted to show an empirical demonstration (Chang *et al*., 2004). Wagner's concept is based on the experience of the early stages of industrialization particularly in Europe and Germany, which suggested that growth of public expenditure was a natural consequence of economic growth. His view on increasing government spending subsequently became a law, known as 'Wagner's Law'. Wagner identified three main factors behind the increasing government spending. These are:

1. Over the period of time as long as economy will get mature (*i.e.*along with growing population, industrialization, and urbanization economy will move from low economic development to high mass consumption), there will be need for government to play its important role in administrative and protective side apart from enhancing social welfare.
2. As far as the economy will expand government expenditure will also expand on various social welfare activities like health, education, infrastructure, recreation facilities *etc.*
3. Advancement in science and technology of a country will result in higher government expenditure on various new projects. Increased expenditure would demand the government to take several economic services for which private sector will feel wary (Khan, 1990).

Apart from the above, the other factor is that in case of merit goods and natural resources monopolies government deliberately takes the production process into its hand in order to make fair and justifiable distribution of the natural resources.

Based on the explanation provided by different scholars it is not clear whether Wagner was trying to suggest an increase in,

1. Absolute level of public expenditure
2. The ratio of government spending to GNP
3. The proportion of public sector in the total economy" (Bhatia, 2011).

This ambiguity in his theory provided a broad base for further research. Consequently, different studies adopted various versions of the law and more often the number of versions remained limited to six. There are different versions of this law that are tested in the literature given in table 1.

Table 1: Six Versions of Wagner's Hypothesis

S. No.	Functional Form	Version
		Absolute Version
1.	$Ln\,(RGE\,) = \beta_1 + \beta_2 Ln\,(RGDP) + u_t$	Peacock and Wiseman (1961)
2.	$Ln\left(\frac{RGE}{P}\right) = \beta_1 + \beta_2 Ln\left(\frac{RGDP}{P}\right) + u_t$	Gupta (1967)
3.	$Ln\,(RGE) = \beta_1 + \beta_2 Ln\left(\frac{RGDP}{P}\right) + u_t$	Goffman (1968)
4.	$Ln\,(RGCE) = \beta_1 + \beta_2 Ln\,(RGDP) + u_t$	Pryor (1969)
		Relative Version

5.	$Ln\left(\frac{NGE}{NGDP}\right) = \beta_1 + \beta_2 Ln\left(\frac{RGDP}{P}\right) + u_t$	Musgrave (1969)
6.	$Ln\left(\frac{NGE}{NGDP}\right) = \beta_1 + \beta_2 Ln\,(RGDP) + u_t$	Mann (1980)

Source: Demirbas, (1999) and Verma et al. (2010)

In the above table, RGE and RGDP, and P respectively indicate real government expenditure, real gross domestic product, and population respectively. Similarly, RGCE, NGE, NGDP stands for real government consumption expenditure, nominal government expenditure, and nominal gross domestic product.

The present study seeks to confirms the existence of long run relationship between PE and GDP.

The paper is divided into five sections, section 2 reviews existing literature on Wagner's hypothesis. Section 3 brings outsource of database and methodology; Section 4 demonstrates empirical work, and finally Section 5 ends the paper with a summary and concluding remarks.

2. LITERATURE REVIEW

In the history of public finance, over a period several studies made to test the Wagner's Law have come out with mixed evidences. A brief review of recent studies is presented in sections 2.1 and 2.2.

2.1 Studies based in Developed and Developing Countries:

Ram (1987) examined Wagner's Hypothesis by using time series and cross section data for 115 countries for the period 1950-80. From time series data, he found that sign and strength of covariance between income and government's expenditure vary considerably across different countries of the world. The hypothesis is supported by about 60% of the countries and refuted in the remaining 40%. While the cross section data result appears to refute the hypothesis. Mohsin *et al.* (1995) found the relevance of Wagner's Law in the context of a group of 20 developing countries by using annual data for the period 1961-90. Cotsomitis *et al*. (1996) used data for the Peoples' Republic of China to test the long-run validity of Wagner's Hypothesis. By using Engle and Granger and cointegration test they found their results in support of Wagner's Hypothesis. Michael *et al*. (1997) examined the causal relationship between government expenditure and GDP in Greece for the period 1958-1993. They used cointegration and error correction mechanism for their study after decomposing the government consumer spending into civilian and military. They found that growth of GDP did not show any effect on civilian expenditure. On the other hand, military expenditure seems to have been influenced by economic growth. Abizadeh *et al.* (1998) empirically examined the relationship between economic development and public expenditure growth in case of South Korea. They concluded that government's spending had positively and significantly affected the private sector's income. Asseery *et al.* (1999) examined the Wagner's Law in Iraq by using the disaggregated data covering the period 1950 to1980 using variables both in nominal and real terms. Their study reveals some evidence for the existence of Wagner's Law when income and several other forms of expenditure are represented in nominal terms. However, once expenditure is taken in real terms, they found a reverse direction of causality. Chow *et al.* (2002) did their study for the UK for the period 1948-1997. By using bivariate cointegration, Granger's multivariate causality test, Zivot's and Andrew's test for stationarity, *etc*., they got evidences in favor of Wagner's Hypothesis. Dilrukshini (2009) analyzed the relationship between public expenditure and economic growth in Sri Lanka for the period 1952-2002. By applying cointegration test for log run relationship, he reached the conclusion that there exists no empirical support either for the Wagner's Law or the Keynesian hypothesis. Afzal *et al.* (2010) reinvestigated the application of the Wagner's Hypothesis in case of Pakistan for the period (1960-2007). By using disaggregated data, they found that Wagner's Law does not hold for three different time periods 1961 to 2007, 1973 to -90 and 1991 to -07, while it holds only for the period 1981 to 91. Pahlavani (2011) *et al.* while investigating the applicability of Keynesian view and Wagner's Law in case of Iran during 1960 to2008 found that unidirectional causality runs from economic growth to the size of government. Kumar *et al.* (2012) reexamined the Wagner's Law in case of New Zealand over the period 1960 to2007. By applying bounds test, Engel and Granger, Phillip Hansen's Fully Modified Ordinary Least Squares, and Johansen's time series tests, they found results in favor of Wagner's law. Oktayer *et al.* (2013) analyzed the relationship between government expenditure and economic growth in Turkey by using annual time series data over 1950 to2010 periods. By using trivariate causality test and autoregressive distributed lag model, they reached the conclusion that there is no long-run relationship between government's expenditure and national income. Ranjan *et al.* (2013) analyzed the applicability of Wagner's Law in case of Indian economy by using annual time series data for the period 1970-71 to 2010-11. The results showed that economic growth is co-integrated with the size of government. Further Granger Causality test showed that a unidirectional causality flows from economic growth to the size of government, confirming the applicability of Wagner's Law in case of India. Dada *et al.* (2013) examined Wagner's Law for Nigeria during the period 1961-2011. Using Johansen multivariate cointegration test, vector error correction mechanism they found evidence for long run causality running from real GDP to government's spending. However, no such relationship was found for a short run. Therefore, the study concluded that Wagner's Law is not a short run but long run phenomena.

2.2 Studies in India

Singh *et al.* (1984) examined the causality between national income and total public expenditure as well as for various components of public expenditure for the period 1950 to81 in case of India. The study revealed a feedback relation. It confirms both the Wagnerian (income causes public expenditure) and the Keynesian (public expenditure causes national income) view. Mohsin *et al.* (1991) examined the causal relationship between public expenditure and national income in case of India with the help of cointegration and Error Correction Modelling for the period 1950-51 to 1988-89. By applying the standard Granger test, they found a unidirectional causal relationship from public expenditure to income in both real and nominal terms, supporting the Keynesian hypothesis. Khundrakpam (2003) examined the public sector spending and economic growth in India for the period 1960-61 to 1996-97. By using the autoregressive distributed lag model, the study found a stable long-run relationship between public sector spending and national income in India. As Causality was running from public sector spending to national income, the study confirmed the applicability of Keynesian hypothesis for the given period. Verma *et al*. (2010) while analysing the relationship between government spending and economic growth in case of India for the period 1950 to 2008 found support for the Wagner's Law both in pre and post reform period.

The above review reveals that studies on the Wagner's hypothesis have produced mixed evidences. The present study attempts to very this law by using ARDL cointegration approach on six versions of the Wagner's law.

3. DATABASE AND RESEARCH METHODOLOGY

The dataset for the present study was taken from RBI Handbook of Statistics on Indian Economy for the period 1970 to2013. Our dataset contains annual observations for variables like real and the nominal GDP, population, government total consumption expenditure.

3.1 Stationary test

To verify long run relationship between government expenditure and total output we need time series data. Before proceeding with any time series analysis, it is necessary to test for stationarity of the processes.

To check whether a given time series process is stationary or non-stationary, the following stationary tests are available namely, Graphical Method, Correlogram test, and the Unit Root test. The present study employs Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) unit root tests to check the stationary of the data.

3.2 Cointegration test: Autoregressive Distributed Lag (ARDL) Approach

The study aims to examine empirically Wagner's Hypothesis in case of India. According to Wagner's Hypothesis, there is co-movement between Public Expenditure (PE) and GDP in the long run. To empirically test this hypothesis, we made use of cointegration analysis. "Cointegration, an econometric property of time series variable, is a precondition for the existence of a long run or equilibrium economic relationship between two or more variables" (Sarbapriya, 2012). Pesaran *et al.* (2001) developed the Autoregressive Distributed Lag Model (ARDL) or ARDL bounds testing approach to cointegration. It has some advantages over conventional cointegration testing approaches (Engle and Granger, 1987; Johansen, 1988; Johansen and Juselius, 1990, among others). First the bound test is easy in procedure as compared to other methods of cointegration; it allows the cointegration relationship to be estimated by Ordinary Lest Square (OLS) once the lag order of the model is identified. Secondly, it can be used even when the series are integrated of order zero or one, even combination of two. Thirdly, ARDL model involves just a single-equation set up, making it simple to implement and interpret. Finally, both short run and long run estimators can be simultaneously estimated.

The ARDL bounds test approach used in this study may be specified as follows

$$\Delta LPE_t = C_0 + \beta_1 LPE_{t-1} + \beta_2 LGDP_{t-1} + \sum_{i=1}^{p} \alpha_i \Delta LPE_{t-i} + \sum_{j=1}^{q} \gamma_j \Delta LGDP_{t-j} + \varepsilon_t \quad \ldots \quad \textbf{(1)}$$

Where, β_1 and β_2 are the long run multiplier, C_0 is the drift and ε_t is the white noise error term, Δ is the first difference operator and, LGDP and LPE are the log of gross domestic product and public expenditure respectively.

The first step in the ARDL bounds testing approach is to estimate equation (1) by OLS method to test for the existence of a long run relationship among the variables. On the basis of F-statistic, the hypothesis (null) of no cointegration against the presence of cointegration (Alternative) among the variables are tested.

Two critical values are given by the Pesaran *et al.* (2001) for the cointegration test, the lower critical bound and the upper critical bound. The lower critical bound assumes that variables are integrated of order zero {I (0)} and upper critical bound assumes that variables are integrated of order one {I (1)}. When the F-statistic exceeds the upper critical bound then the null hypothesis of no cointegration will be rejected *i.e.*, there is cointegration. If the F-statistic is below the lower critical bound then the null hypothesis of no cointegration will be accepted *i.e.*, there is no cointegration among the variables. Apart from this if F-statistic fall in between lower and upper bound then the result will be inconclusive.

If there exists a long run relationship among the variables, the second step is to estimate the long-run model for LPE.

$$LPE_t = C_0 + \sum_{i=1}^{p} \delta_1 LPE_{t-i} + \sum_{j=1}^{p} \delta_2 LGDP_{t-J} + \varepsilon_t \qquad \textbf{... (2)}$$

By using different information criteria, we select the order of the variables in the ARDL model. There are various criteria for lag selection such as Akaike Information Criteria (AIC), Schwarz Bayesian Information Criterion (SBIC), FPE, LR, HQIC and so on.

In the third and final step of the bounds testing procedure, we obtain the short run dynamic parameters by estimating an error correction model associated with the long run estimates. This is specified as follows:

$$\Delta LPE_t = C_0 + \sum_{j=i}^{p} \delta_{\mathrm{i}} \Delta LPE_{t-i} + \sum_{j=i}^{q} \delta_{\mathrm{j}} \Delta LGDP_{t-i} + \zeta ect_{t-1} \qquad \textbf{... (3)}$$

In equation (3), δ_i and δ_j are the short run dynamic coefficients of the model's convergence to equilibrium, ζ is the speed of adjustment. Here in order to estimate the speed of adjustment of the dependent variable to independent variable(s), the lagged level variables in equation (1) are replaced by ect_{t-1} and "ect" is the error correction term derived from the long run relationship. If the value of speed of adjustment is zero it means, there exist no long run relationship. If it is in between -1 and 0, there exists partial adjustment. A value smaller than -1 indicates that the model over adjusts in the current period, finally a positive value implies that the system moves away from equilibrium in the long run (Asuman, 2013).

Finally, some diagnostic and stability tests are used to evaluate our model. The diagnostic tests check for serial correlation, autoregressive conditional heteroscedasticity (ARCH), the functional form of the model and normality of residual term. In addition, the stability tests of long run and short run parameters are conducted by using the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares (CUSUM square) of recursive residuals.

4. EMPIRICAL ANALYSIS

4.1 Stationary Test

The stationarity of the process is assessed with the help of two-unit root tests *viz.,* Augmented Dickey Fuller (ADF) and Phillips-Perron (PP). Although the bounds test for cointegration does not require that all variables should be integrated of order one {I (1)}, even it is important to conduct the stationary test in order to ensure that no variable is integrated of order two {I (2)}. If the variables will be {I (2)}, the F- test will be spurious or the computed F-statistics produced by Pesaran *et al*., (2001) and Narayan (2005), will not be valid (Odhianbo, 2009 and Mosayeb *et al*., 2011). Further, as we used Granger-causality test to check the causal direction between variables, it is necessary that variables be stationary.

The result of ADF test fail to reject the null hypothesis of unit root at level, *i.e.* variables are non-stationary at levels. But at first difference, null hypothesis got rejected, *i.e.* variables become stationary at first difference. To complement the ADF results, we also performed Phillips-Perron test that is more robust to autocorrelation and heteroscedasticity. Phillips-Perron test also supports the previous test results. The result of the ADF and PP unit root test are reported in the table 2.

Table-2: Unit Root Test Results

Variables	ADF		PP	
	Level	First Difference	Level	First Difference
LRGDP	-1.985	-7.483*	-2.004	-7.881*
	(0.5929)	(0.00)	(0.583)	(0.00)
LRPGDP	-1.6208	-7.4632*	-1.630	-7.847*
	(0.7681)	(0.00)	(0.764)	(0.00)
LRGEXP	-2.889	-6.346*	-2.855	-6.419*
	(0.1759)	(0.00)	(0.187)	(0.00)
LRGCEXP	-2.989	-5.954*	-2.955	-5.958*
	(0.1759)	(0.00)	(0.156)	(0.00)
LRPGEXP	-2.698	-6.3289*	-2.600	-6.394*
	(0.2425)	(0.00)	(0.282)	(0.00)
LNGEXP/NGDP	-2.85	-3.912*	-2.403	-6.540*
	(0.1889)	(0.02)	(0.373)	(0.00)

*Note: * indicates statistically significant at 1% level of significance. The values in parenthesis are probability values; Source*: Author Calculated.

4.2 Cointegration Test

The unit root tests reveal that both variables are integrated of order one. In the next step we performed ARDL bounds test approach to examine the existence of cointegration. The bounds test approach on all six alternative versions of Wagner's law has been used to examine long-run relationship between the variables. To know the appropriate lag length of variables in ARDL model we used the AIC and SBC criteria. Order of the variables in different versions are as follows:

Table-3: Lag Selection Criteria

Models	Lags	AIC	SBC
A: Peacock and Wiseman	1	-7.36	-7.10
B: Gupta	1	-7.31	-7.06
C: Goffman	1	-7.28	-7.02
D: Pryor	1	-7.50	-7.24
E: Musgrave	1	-10.83	-10.57
F: Mann	1	-10.87	-10.62

Source: Author Calculated

At lag order one, there is strong evidence of cointegration between PE and GDP for all the versions of Wagner's law because the calculated F-statistics is greater than the critical values of upper bound (given in Pesaran et.al. 2001) at 5% level of significance. The results are reported in Table 4.

Table 4: Bounds F-test for Cointegration

Models	Dependent Variable	F-test Statistic	Cointegration
Model A	LRGXP	2.334	NO
	LRGDP	33.090	YES
Model B	LPRGEXP	2.403	NO
	LPRGDP	21.900	YES
Model C	LRGEXP	2.030	NO
	LPRGDP	17.000	YES
Model D	LRGCEXP	1.360	NO
	LRGDP	12.330	YES
Model E	L(NGEXP/NGDP)	1.880	NO
	LPRGDP	25.540	YES
Model F	L(NGEXP/NGDP)	1.810	NO
	LRGDP	58.330	YES

Source: Author Calculated

Coefficient diagnostic and residual diagnostic (against serial correlation LM test, histogram-normality test and ARCH LM test for heteroscedasticity) results are shown in the table-5 for each of the models. Further stability of the parameter over the sample period (1970-2013), has been tested using the cumulative sum (CUSUM) and cumulative sum of squares (CUSUM sq) tests. The respective test results for all the versions or models are reported in figure 1 to 6.

Based on the performance of different diagnostic tests, the results as reported in different tables depict that all models are fit to be used for the estimation purpose. The test results show that there is the absence of autocorrelation, functional misspecification, heteroscedasticity in the models and the errors follow the normal distribution.

Table-5: Diagnostic Tests

	Diagnostic Tests			
Model	Normality Test	LM Test	ARCH Test	RESET Test
A: Peacock and Wiseman	1.078 (0.58)	0.577428 (0.4523)	0.345837 (0.5599)	0.205935 (0.6527)
B: Gupta	1.08 (0.58)	0.431 (0.516)	0.165 (0.687)	0.621 (0.436)
C: Goffman	0.93 (0.63)	0.507 (0.48)	0.578 (0.452)	0.012 (0.914)
D: Pryor	2.36 (0.31)	0.395 (0.533)	1.148 (0.29)	0.352 (0.557)
E: Musgrave	15.19 (0.00)	0.811 (0.373)	0.028 (0.867)	1.405 (0.243)
F: Mann	13.26 (0.00)	1.163 (0.373)	0.019 (0.887)	1.4 (0.244)

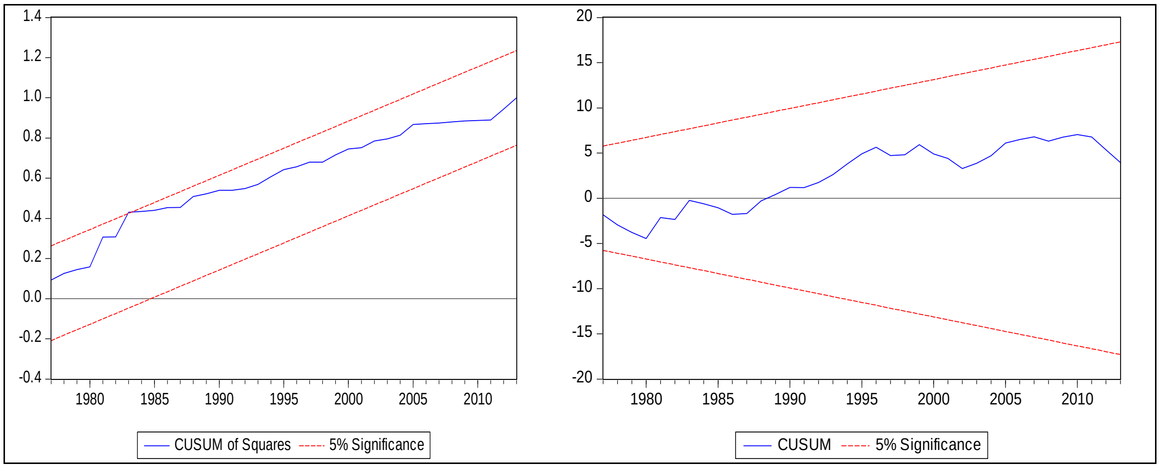
Note: The values in parenthesis are probability values.

4.3 Coefficient Stability Tests

The parameter stability or coefficient stability of any model has been considered to be crucial. The coefficient stability is tested by plots of CUSUM and CUSUM squares given in figures 1 to 6. In all the graphs the straight lines represent critical bounds at 5% significance level, since the plot of these two tests do not cross the critical value line except in Musgrave and Mann versions, indicating a stable long run relationship between government expenditure and GDP. Overall we can conclude that coefficients are stable in the long run.

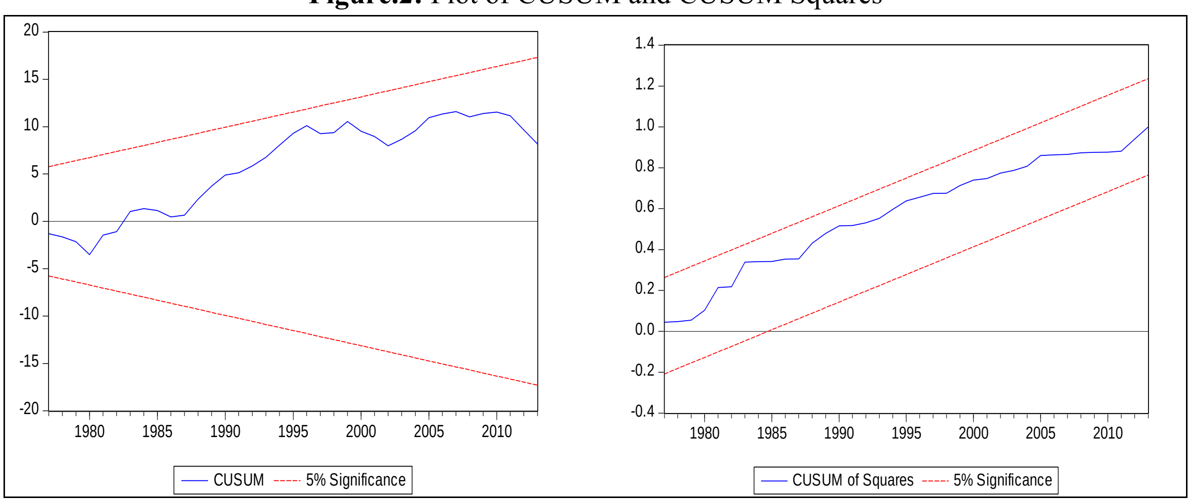
Parameter Stability Test for Peacock and Wiseman Model (Model -A)

Figure.1: Plot of CUSUM and CUSUM Squares



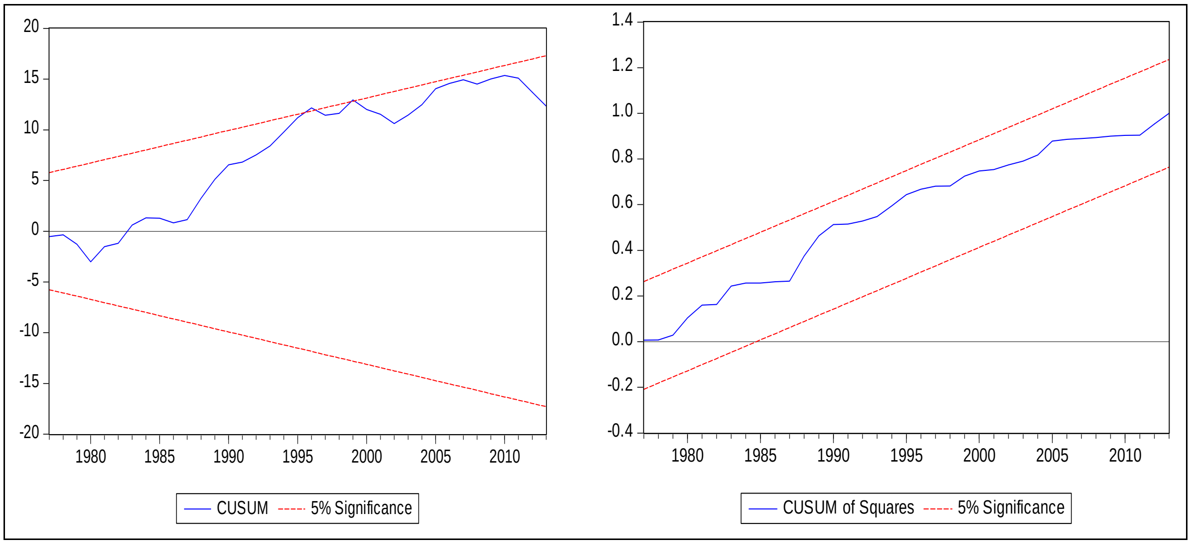
Parameter Stability Test for Gupta Model (Model B)

Figure.2: Plot of CUSUM and CUSUM Squares



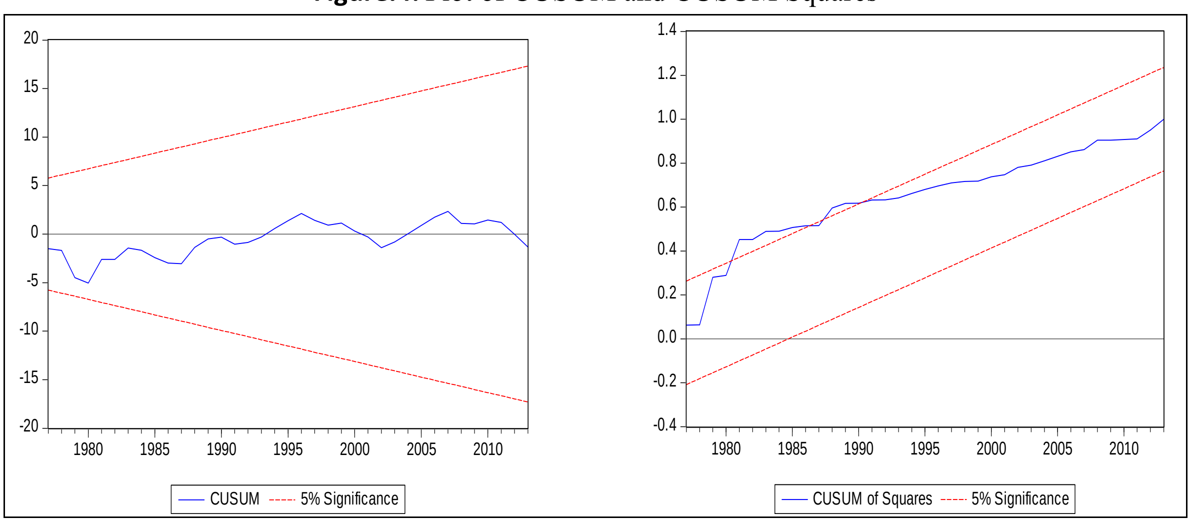
Parameter Stability Test for Goffman Model (Model C)

Figure.3: Plot of CUSUM and CUSUM Squares



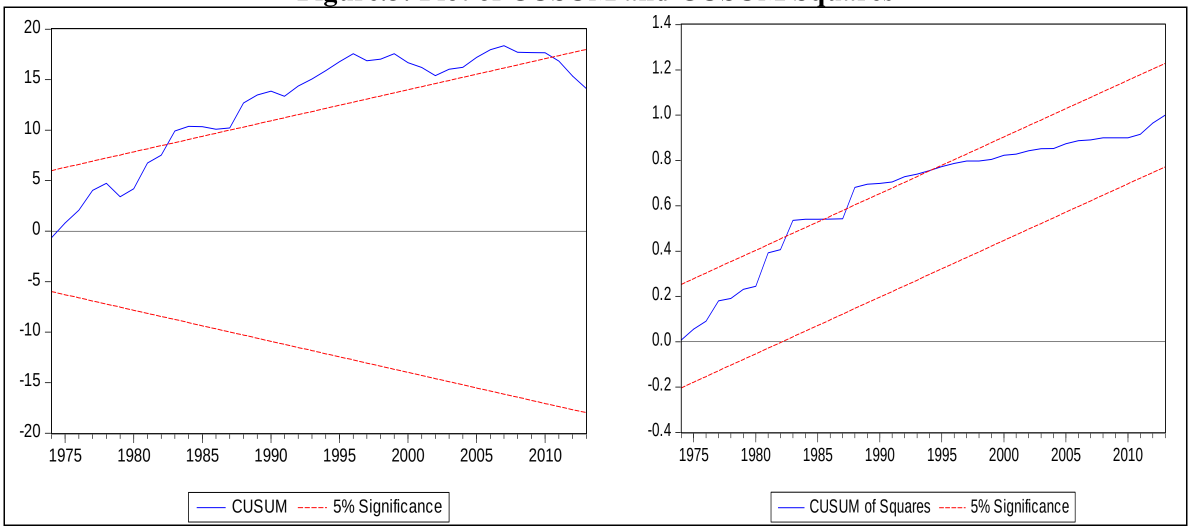
Parameter Stability Test for Pryor Model (Model D)

Figure.4: Plot of CUSUM and CUSUM Squares



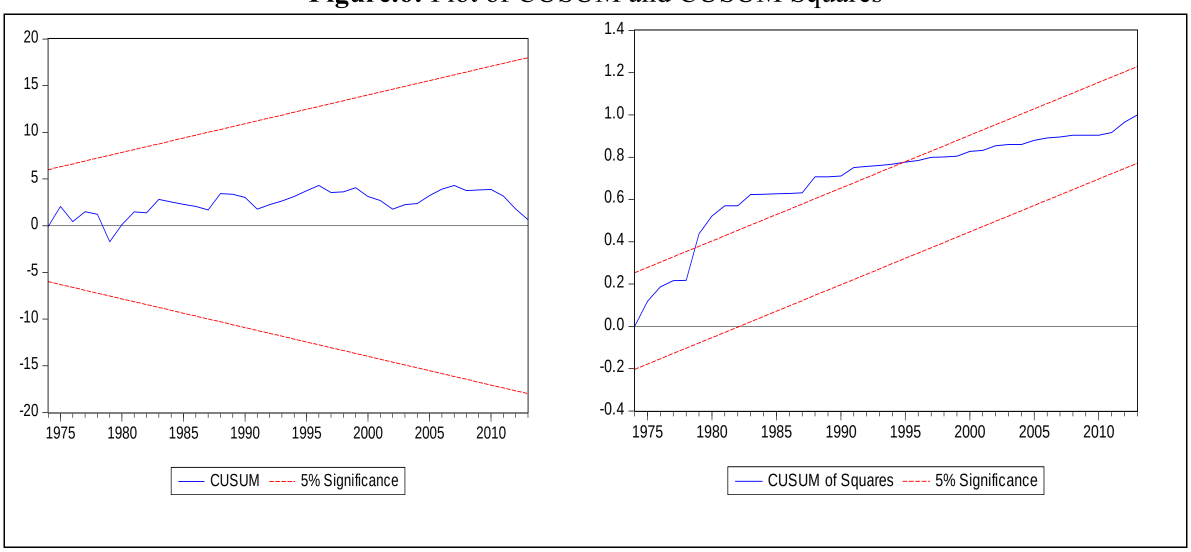
Parameter Stability Test for Musgrave Model (Model E)

Figure.5: Plot of CUSUM and CUSUM Squares



Parameter Stability Test for Mann Model (Model F)

Figure.6: Plot of CUSUM and CUSUM Squares



4.4 Long run Relationship

Long run estimated coefficients for all the versions have been reported in table 6. The result shows that only in case of Peacock and Wiseman version, the government expenditure coefficient is significant at 5% level of significance. While in case of Goffman model the long run coefficient of government expenditure is significant at 10% level of significance. In case of Gupta, Pryor, Mann and Musgrave models, the long run coefficients are insignificant. Since only in case of Peacock and Wiseman version the long run coefficients are significant while in other cases insignificant, it may be concluded that there is only little evidence of cointegration between PE and GDP.

Table-6: Long Run Coefficients.

		Long Run Coefficients		
Model	Dependent Variable	Regressors	Coefficient	Prob.
A: Peacock and Wiseman	LRGDP	LRGE C	1.549** -0.926	0.023 0.789
B: Gupta	LRPGDP	LRGEXP C	2.421 1.634*	0.301 0.004
C: Goffman	LRPGDP	LRGXP C	1.304*** -6.419	0.082 0.187
D: Pryor	LRGDP	LRGCE C	1.58 0.01	0.23 0.999
E: Musgrave	LRPGDP	L(NGEXP/NGDP) C	-0.666 0.73	0.553 0.72
F: Mann	LRGDP	L(NGEXP/NGDP) C	-0.948 5.153	0.6364 0.176

NOTE: *, **, *** indicate level of significance at 1 %, 5 % and 10 % level of significance respectively.
Source: Author Calculated.

4.5 Error Correction Model (ECM)

In the next phase of analysis, the focus is on ECM, in which we capture the direction of causality between the variables by testing the significance of coefficient of the lagged error-correction term (ζ) (Odhimabo, 2010). Further, we will also go for the short run dynamics of the variables in ECM. Accordingly, the short run versions of ARDL models are estimated, the respective results are reported in the table 7 and 8.

An ECM model has two important parts, estimated short-run coefficients and error correction term (ECT). Error correction term provides the feedback or speed of adjustment from short run to long run equilibrium. There are two important things about ECT. The

ECT coefficient should be significant on the one hand and on the other hand it must be negative that provides further proof of stable long run relationship (Banerjee *et al*. 1998, Shahbaz M, 2010).

The test results of the short run model show that ECT is very weak in almost all the versions except Musgrave and Mann. In case of Musgrave and Mann, ECT is significant but the coefficient is not negative. While in case of other versions ECT is negative but insignificant. Hence we cannot rely on ECM for short run causality.

Table: 7 – Short run Dynamics

Short Run Coefficients			
Model	Variable	Coefficient	Prob.
A: Peacock and Wiseman	D(LRGE) D(LRGE(-1)) ecm(-1)	0.195* -0.119** -0.031	0.001 0.026 0.374
B: Gupta	D(LRPGEXP) D(LRPGEXP(-1)) ecm(-1)	0.201* -0.123** -0.023	0.001 0.025 0.527
C: Goffman	D(LRGXP) D(LRGXP(-1)) ecm(-1)	0.192* -0.114** -0.033	0.001 0.031 0.353
D: Pryor	D(LRGDP(-1)) D(LRGCE) ecm(-1)	-0.229 0.176** -0.024	0.142 0.01 0.546
E: Musgrave	D(L(NGEXP/NGDP)) ecm(-1)	0.023 0.035*	0.557 0.00
F: Mann	D(L(NGEXP/NGDP)) ecm(-1)	0.018 0.019*	0.636 0.003

NOTE: *, **, *** indicate level of significance at 1 %, 5 % and 10 % level of significance respectively.

Table-8: Wald Test Results.

Wald Test Based on ECM		
Model	F-statistics	Chi-square
A: Peacock and Wiseman	460.12 (0.00)	920.24 (0.00)
B: Gupta	450.892 (0.00)	901.783 (0.00)
C: Goffman	407.934 (0.00)	815.868 (0.00)
D: Pryor	297.684 (0.00)	595.369 (0.00)

E:	Musgrave	5823.405 (0.00)	11646.81 (0.00)
F:	Mann	14143.99 (0.00)	28287.97 (0.00)

Note: The values in parenthesis are probability values.
Source: Author Calculated.

5. SUMMARY AND CONCLUDING REMARKS

The relationship between Public Expenditure (PE) and GDP has remained a debatable issue in the public finance literature. It gave rise to various schools of thought, which tried in their way to limit or expand the economic boundary of government. While some supported the involvement of government in core economic activities, others restricted its role for the mere provision of peace and security. From cause and effect sense, the two approaches came to the forefront. One showed the importance of government expenditure to affect economic activity at different points of business cycle (Keynesian Approach) and the other explained the historical expansion of government sector with respect to spreading out of economic activities (Wagnerian Approach). The major difference between these two approaches is one of direction of causality. In case of Wagnerian approach, causality runs from GDP to PE while in Keynesian context causality runs from PE to GDP. In the light of this background, present study attempts to verify the applicability of Wagnerian approach in case of India empirically by considering time series data for the period 1970 to 2013.

Wagner's Hypothesis states that there exists a positive relationship between state activities and public expenditure. Because of some ambiguity in its functional form different versions of the law have come into being in the literature. These include Musgrave, Mann, Gupta, and Goffman. To verify the long run relationship between PE and GDP in case of India, we adopted ARDL cointegration approach. Due care is taken with respect to the functional form, serial correlation, normality assumption, heteroscedasticity and coefficient stability of the model. The results of the study showed that there exists a long-run relationship between PE and GDP, and at the same time weak evidence in support of the Wagnerian law.

The finding of support for the Keynesian approach is in line with planning strategy that was followed in the country from the beginning of the 1950s. As we received a ruined economy at the time of independence, it was very difficult for private enterprise to come forward to manage a destabilized weak economy. The intervention of government in the economic sphere was found to be the best solution to overcome all the lapses and built a strong economic base for the years to come. So accordingly government got involved on a large scale to create economic opportunities for the growing population. One can easily understand the story by looking at the rising public spending over the period. In fact, the growth of public sector served its purpose to a great extent to provide a big push to all economic activities, although the generation of problems like inefficient use of resources cannot be neglected. It was only after reforms of the 1990s that we notice some decrease in the proportion of public spending, but it does not diminish the importance of government involvement in various economic activities. Overall throughout the world once again a wave has started supporting the importance of the public sector to manage and correct the market failures that have damaged the economic prosperity of billions of people both in developed and developing countries. India is not an exception for involving government sector in imperative economic activities side by side with private sector, as it did over the period of time after planning. Thus, our study finding does not contrast with the Keynesian approach where government sector influences the economic growth of the country. Government spending has boosted national output to a great extent throughout the period concerned.

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Off Link Road, Malad (W), Mumbai 400 064,
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