Impact of Expenditure on Economic Growth in Pakistan

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Abstract
This study aimed to find out the impact of expenditure on economic growth in Pakistan, using the time series data for the period 1972 to 2013. Secondary data was acquired from World Development indicators and Pakistan Bureau of Statistics. Augmented Dicky Fuller Test (ADF) test was applied to check the stationarity of the data. Johansen Cointegration and Granger Causality tests were applied to empirically investigate the relationship between given variables (expenditure and economic growth) in Pakistan. The cointegration results indicated that there is no any relationship between expenditure and national income in the long run.

Keywords: Public Expenditure, Error Correction Mechanism, Wagner Law, Income, Causality

Introduction
Theoretically the two opposite views about relationship between economic growth and national income are Keynesian and Wagner’s view. According to Wagner (1890) public expenditure rises as a result of rise in real per capita income known as Wagner’s Law. In short the rise in government expenditure is the outcome of economic growth and causality should run from national income to Gov. Expenditure. While Keynesian consider economic growth as an independent variable and economic growth is due to public expenditure. Keynes support rising government expenditure for enhancing economic growth (short term & long term growth). In Keynesian view casualty should goes from government expenditure to national income.
Several empirical studies have been conducted in countries around the world for investigation of existence of Keynesian and Wagner’s Hypothesis. The empirical research of Srinivasan (2013)
and Ebaidalla (2013) supports Wagner’s Law. However, empirical research of Musgrave (1969) & Mann (1980) did not support both the views. There are six various version of Wagner hypothesis. First model which is given by Peacock-Wiseman (1961), second model is presented by Gupta (1967), third model by Goffman (1968), fourth model by Pryor (1969), fifth by Musgrave (1969) & sixth model is given by Mann (1980) are given below.

Model 01: \( \ln (Gex) = \alpha + \beta \ln (Gdp) + u \)

Model 02: \( \ln \left( \frac{Gex}{Pop} \right) = \alpha + \beta \ln \left( \frac{Gdp}{Pop} \right) + u \)

Model 03: \( \ln (Gex) = \alpha + \beta \ln \left( \frac{Gdp}{Pop} \right) + u \)

Model 04: \( \ln (Gce) = \alpha + \beta \ln (Gdp) + u \)

Model 05: \( \ln \left( \frac{Gex}{Gdp} \right) = \alpha + \beta \ln \left( \frac{Gdp}{Pop} \right) + u \)

Model 06: \( \ln \left( \frac{Gex}{Gdp} \right) = \alpha + \beta \ln (Gdp) + u \)

Where \( \ln = \) natural log, \( Gex = \) Government Expenditure, \( Gce = \) Government Consumption expenditure, \( Pop = \) population

This study aimed to test the two hypotheses about expenditure and economic growth for Pakistan.

LITERATURE REVIEW

Nkiru and Daniel (2013) examined the relationship among economic and government expenditure by using ECM for Nigeria. The authors used annual data from 1977 to 2012. Expenditure on education was taken as government expenditure for Nigeria in the study. The authors found significant and positive effect of expenditure on growth. However, Sevietenyi (2012) also conducted study for Nigeria and found that Wagner Law does not exist in Nigeria but the results are supporting Keynesian hypothesis. Author used Toda-Yamamoto Granger Causality test and Cointegration test in the given study.

Abbas and Afzal (2010) tested the validity of Wagner hypothesis for Pakistan. They have used time series data of Pakistan from (1960-2007) and used Cointegration and Granger Causality test. Authors have examined the Wagner Law for four periods in Pakistan. The four periods are 1960-1972, 1981-1991, 1981-2007, and 1991-2007. According to results Wagner Hypothesis doesn’t hold for the period 1981-1991. The results of causality shows that among fiscal deficit and public spending there is unidirectional causality. Similarly, income and fiscal deficits also have unidirectional causality. However, causality does not exist between income and public spending.

Shams and Murad (2009) test the Wagner Law in Bangladesh by using Granger Causality test and Cointegration test. The study period was 1972-73 to 2007-08. The authors have test all the five versions of Wagner Law for Bangladesh. According to author’s findings absence of Wagner Law in Bangladesh.

Moosa (2013) results show existence of Wagner’s hypothesis in Saudi Arab. For empirical analysis the author used six different version of Wagner’s Law by using Error Correction Mechanism (ECM) and Cointegration for GDP (real) and GDP (non-oil). The data for this research was annual data from 1970-2012. The studies of Mahjoub (2013) found existence of
Wagner Hypothesis in Sudan. Similarly, Sriviasan (2013) results shows existence of Wagner hypothesis in India from 1973-2012. Ju Huang (2013) tests the Wagner Law for Taiwan China. He used Toda and Yamamoto causality test and Bound test. For empirical analysis annual data from 1979 to 2012 has been used. The results of both tests indicates absence of causality among variables (national income and government expenditure) for both countries along with in long run there is no relationship among national income and government expenditure in China and Taiwan.

**Methodology**

For empirical investigation of long run relationship among Expenditure (LnEXP) and economic growth (lnGDP) I have used Johansen Cointegration and Causality Test. The reason for choosing these tests is to find out the causal relationship between variables and to know the long run relation. The period of study is 1972-2013. For this study the variables are Gross national expenditure and Gross domestic product of Pakistan. Johansen test has been used for knowing the long run relationship while granger causality test is used to check the causal relation among variables of the study. The data sources are World Development indicators and Pakistan Bureau of Statistics. Augmented Dicky Fuller Test is used to check the stationary and non stationary in the data.

**Granger Causality Test**

Following model is proposed for Granger Causality test

\[ \ln\text{EXP}_t = \beta_0 + \sum_{j=1}^{n} \beta_1 \ln\text{GDP}_{t-1} + \sum_{j=1}^{n} \beta_2 \ln\text{EXP}_{t-1} + \mu_t \]

\[ \ln\text{GDP}_t = \lambda_0 + \sum_{j=1}^{n} \lambda_1 \ln\text{EXP}_{t-1} + \sum_{j=1}^{n} \lambda_2 \ln\text{GDP}_{t-1} + \nu_t \]

Where \( \ln\text{EXP}_t \) = Natural logarithm of Expenditure

\( \ln\text{GDP}_t \) = Natural logarithm of Gross Domestic Product

\( \mu_t \) & \( \nu_t \) = Error Term

**DATA ANALYSIS AND RESULTS:**

Acquired secondary data was processed and analyzed using E-Views-7 software. Table-1 and Table-2 shows the results of Augmented Dicky Fuller (ADF) for variable expenditure (EXP) & Gross domestic product. Both variables are transformed into natural logarithm form represented as LN. The variables lnEXP & lnGDP at level are non-stationary. They became stationary after first difference.

Insert Table 01

From results of trace statistics (Table 3) trace statistics < critical value, therefore we cannot reject null hypothesis and hence we conclude that variables are not integrated. Similarly Max
Eigen Statistics (Table 4), we cannot reject null hypothesis because \textbf{max. Eigen stats < critical value} which means variables have not long run relationship among each other.

\textbf{Insert Table 02 & 03}

Pairwise Granger Causality test result shows no causality between lnGDP and LnEXP in Pakistan for study period. The results indicates non-existence of Wagner’s Law and Keynesian Law in Pakistan. The study results are supporting the views of Musgrave (1969), Mann and empirical studies conducted by (1980) Shams and Murad (2009) for Bangladesh, Ju Huang (2013) for Taiwan China.

\textbf{Insert Table 04}

\textbf{Conclusion}

The research aims at analyzing impact of expenditure on economic growth in Pakistan. Variables of the study are initially non-stationary (at level) they are converted in to stationary by taking first difference. Results of cointegration show that there is no any relationship in long run among growth and expenditure. Similarly, pairwise causality test also indicates no causal relations among variables. The results are supporting the views of Musgrave (1969) & Mann (1980) according to them expenditure and growth have not causal relation. However, this empirical research doesn’t support Keynesian and Wagner hypothesis in Pakistan for study period. The implication from this study is that expenditure is not an important tool for achieving growth rate in Pakistan.

\textbf{References}


Table 01: ADF test Results
Both variables (lnGDP and LnEXP) became stationary at first difference.

<table>
<thead>
<tr>
<th></th>
<th>At level</th>
<th></th>
<th>Trend and intercept</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>LnGDP</td>
<td>-2.392178</td>
<td>-4.109037</td>
<td>5.464954</td>
<td></td>
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<tr>
<td>LnEXP</td>
<td>-2.397851</td>
<td>-3.979417</td>
<td>4.922859</td>
<td></td>
</tr>
</tbody>
</table>

At First Difference

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LnGDP</td>
<td>-2.704410*</td>
<td>-2.533484*</td>
<td>-1.677877*</td>
</tr>
<tr>
<td>LnEXP</td>
<td>-2.573587*</td>
<td>-2.451130*</td>
<td>-1.718813*</td>
</tr>
</tbody>
</table>

*Shows significance level at 5%.

Table 02: Trace Statistics

<table>
<thead>
<tr>
<th>Hypothesized Number of Cointegration</th>
<th>Eigenvalue</th>
<th>Trace stats</th>
<th>Critical value (5%)</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0.249</td>
<td>13.827</td>
<td>15.495</td>
<td>0.089</td>
</tr>
<tr>
<td>At most 1</td>
<td>0.058</td>
<td>2.394</td>
<td>3.841</td>
<td>0.122</td>
</tr>
</tbody>
</table>

Note: Values are rounded to three figures after decimal.

Table 03: Maximum Eigenvalue

<table>
<thead>
<tr>
<th>Hypothesized Number of Cointegration</th>
<th>Eigenvalue</th>
<th>Trace stats</th>
<th>Critical value (5%)</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0.249</td>
<td>11.433</td>
<td>14.265</td>
<td>0.134</td>
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<tr>
<td>At most 1</td>
<td>0.058</td>
<td>2.394</td>
<td>3.841</td>
<td>0.122</td>
</tr>
</tbody>
</table>

Note: Values are rounded to three figures after decimal.

Table 04 Pairwise Granger Causality Test

<table>
<thead>
<tr>
<th>Ho (Null Hypotheses)</th>
<th>Observations</th>
<th>F-Stats</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNGDP does not Granger Cause LNEXP</td>
<td>40</td>
<td>2.28971</td>
<td>0.1163</td>
</tr>
<tr>
<td>LNEXP does not Granger Cause LNGDP</td>
<td>1.63160</td>
<td>0.2101</td>
<td></td>
</tr>
</tbody>
</table>

Note: at lag 2