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2011

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Abstract

The nexus between government revenue and government expenditure always wins the attention of policy makers and think tanks while they work four making fiscal policies for an economy. This paper is an empirical investigation on the unidirectional causality between government expenditures and the revenues, which government collects from public in shape of various levied taxes. Annual data for Pakistan from the period of 1979 to 2010 for governmental expenditures and its tax revenue have been collected. While, the unidirectional and bidirectional causality were interrogated via applying Granger causality for the outlined variables. The results indicate that there is an uni-directional causality between the expenditures and revenues, which runs from tax revenues to govt. expenditures, that is the previous lags of tax revenue has a causal impact on the current govt. spending.

1. Introduction
The nexus between government expenditure and revenue collection generated through levied taxes are always a question which compel every policy maker to ponder over it. As this association is always translated in the fiscal policy/ annual fiscal budget and it is the one which matters for government expenditure plans and taxation structure of a country. Economic growth with low debt levels, better education system, and development of infrastructure, job opportunities and friendly fiscal policy are the players of an economy which always rely on this association. This paper aims at focusing on the investigating the application of ARDL model when whether or not various lags (lag 1 and 2) of tax/ revenue collections and govt. expenditures predict to one another, while investigating the bidirectional and/ or unidirectional causality between them.

2. Literature Review
A very less light has been showered on the question of why the nexus between government revenue and expenditure is still an unsolved issue. Nanthakumar and Taha (2007) had found a stable relationship between government spending and revenue for the various countries from the Asian space. Buchanan and Wagner (1977) explained that expenditure of the government depends on total revenue which government generates and the tax / revenue collections is the one which increases the government expenditures because increase in taxes collection increases the prices of goods which makes public welfare expensive and hence the government expenditure increases. Sobhee (2004) tested the causality from tax to expenditure and from expenditure to taxes by using the data of public finance and founded that for the utilization of public expenditure in a small economy government first accommodate the necessary funds, therefore to avoid the situation of fiscal deficit the government must carefully monitor and control its spending programs.

Fasano and Wang (2002) in their research on GCC countries founded the unidirectional causality runs from government expenditure to revenue collection, the government first spends and then to accommodate the required level of expenditure adjusts tax policies. It is so to speak that the government expenditure is driven by strong economic crises and this proposition has been supported by Peacock and Wiseman (1979) where they argued that it is due to economic crises government expenditure increases and remain at the same level even when the crises is over. Gounder, Narayan, and Prasad (2007) found that the increase in taxes for the accommodating government spending affects on the capital investment by investors due to the fear of paying higher taxes in future. Meltzer and Richard (1981), proposed that the demand of public expenditures and taxes should have the bidirectional causality and they investigated and confirmed their proposed proposition for various economies which include Bangladesh, United Kingdom etc. Narayan and Narayan (2006) suggested three reasons regarding the importance of nexus between government revenue and expenditure first if proper implementation on policies is taken into consideration regarding government revenue fiscal deficit can be avoided, second if causality runs from expenditure to revenue outflow increases due to the fear that government spends first and pay for it later by increasing taxes. Third in case of bidirectional causality expenditure can rise faster than revenue which can create huge budget deficits because revenue and expenditure decisions are independent of each other.

Nanthakumar and Taha (2008) found in an analysis of Malaysia that the major part of taxes is direct taxes and reducing direct and indirect taxes leads to reduce in government expenditures, In addition non-tax revenue does not contribute much in economy's growth. Hondroyiannis and Papapetrou (1996) find unidirectional causality running from government expenditure to revenues in Greece to overcome the fiscal deficit, where the reason of fiscal deficit from a long period of time was government spending

decisions. Baghestani (2004) supported the causality from tax revenue to expenditure in case of Egypt and bi-lateral causality in case Jordan. Keho (2010) Study the data from 1960 to 2005 of European space to analyze the cause and effect relationship between government expenditure and revenue Collection while integrating and confirming the unidirectional causality between them as, his findings of granger causality test indicate the unidirectional causality from government revenue to expenditures. Baffes and Shah (1990) conducted the research for the countries Argentina, Brazil, Chile, Mexico, and Pakistan to determine causality between revenue and expenditures for the alignment of fiscal deficit. For Brazil, Mexico and Pakistan causality runs in both ways that is bidirectional causality was observed between the government expenditures and revenue collection for these nations. However in case of Argentina and Chile causality runs from expenditure to revenue.

3. Hypotheses

H1: Tax Revenues unidirectional causes Government Expenditures.
H2: Government Expenditure unidirectional causes Tax Revenues.
H3: Tax Revenues and Government Expenditures bidirectional cause to each other.

4. Research Methods

4.1 Description of Data & Sample
To investigate the causality between the Govt. expenditures and tax revenues, a sample of 31 annual observations for the outlined variables from the year 1979-2010 are used. Data for Government Expenditure and tax revenues were taken from secondary sources which include the website of Ministry of Finance, State bank of Pakistan and Hand book of Statistics on Pakistan Economy.

4.2 Econometrical Model
Bi-variate Granger causality test by Granger (1969) has been applied to study the causal relationships between the two outlined time series which include Government Expenditure and tax revenues with objective to interrogate the unidirectional/ bidirectional causality. The frame work of ARDL model is deployed to investigate the possible existence/ non existence of bidirectional/ unidirectional causality between the out lined series as shown in equations 1 and 2.

$$X1(t) = \sum_{j=1}^{p} A11, jX1(t-j) + \sum_{j=1}^{p} A12, jX2(t-j) + E1(t) \qquad (1)$$

$$X2(t) = \sum_{j=1}^{p} A21, jX1(t-j) + \sum_{j=1}^{p} A22, jX2(t-j) + E1(t) \qquad (2)$$

Where, X1= Govt. Expenditures (Total_EX).
     X2= Tax Revenues (Total_RE).

While, p is the maximum number of lagged observations included in the model (the model order), the matrix A contains the coefficients of the model (i.e., the contributions of each lagged observation to the predicted values of $X1(t)$ and $X2(t)$, and $E1$ and $E2$ are residuals (prediction errors) for each time series. If the variance of $E1$ (or $E2$) is reduced by the inclusion of the $X2$ (or $X1$) terms in the first (or second) equation, then it is said that $X2$ (or $X1$) Granger-(G)-causes $X1$(or $X2$). In other words, $X2$ G-causes $X1$ if the coefficients in $A12$ are jointly significantly different from zero. This can be tested by performing an F-test of the null hypothesis that $A12 = 0$, given assumptions of covariance stationarity on $X1$ and $X2$. The

magnitude of a G-causality interaction can be estimated by the logarithm of the corresponding F-statistic (Geweke, 1982). In addition the Bayesian Information Criterion (BIC, (Schwartz, 1978)) has been used to conclude the causality for the appropriate model order *p*.

5. Findings & Results

Table 1: Granger Causality Test when p=2

Pairwise Granger Causality Tests
Sample: 1 32
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
TOTAL_EX does not Granger Cause TOTAL_RE	30	0.84135	0.4430
TOTAL_RE does not Granger Cause TOTAL_EX		14.2132	8.E-05

Table 2: Granger Causality Test when p=1

Pairwise Granger Causality Tests
Sample: 1 32
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
TOTAL_EX does not Granger Cause TOTAL_RE	31	0.20627	0.6532
TOTAL_RE does not Granger Cause TOTAL_EX		46.4229	2.E-07

Findings confirms that Govt. expenditures and tax revenues does not granger cause bi-directionally to each other (rejections of hypothesis 3) but, it is revealed as shown in Table 1 and 2 that there is a unidirectional causality which runs from tax revenues (Total_RE) to Government expenditures (Total_EX) as F > 3.5 for both the order which include p=2 and p=1, which imply that the lag 2 and lag 1 of tax revenues significantly cause and decide the Govt. expenditures for the current lag and hence, we fail to reject the hypothesis 1. Whereas, it is also revealed that the outlined orders/ lags of Govt. expenditures (Total_EX) do not cause or decide the taxes/ revenue collection as F< 3.5 and hence we fail to accept the hypothesis 2.

6. Conclusion & Discussions
The findings of this paper confirm that the tax revenue of previous fiscal periods collected by the government causes and decides the current Govt. expenditure in case of Pakistan. Baghestani (2004) also confirmed the same causality from tax revenue to expenditure for the case of Egypt. Keho (2010) for the period from 1960 to 2005 for European space also found the unidirectional causality between the stated outlined series and empirically stressed the unidirectional causality from government tax revenue to govt. expenditures. In contrast to the findings of this paper and other various researches Hondroyiannis and Papapetrou (1996); Fasano and Wang (2002) founded the unidirectional causality between the outlined variables which runs from government expenditure to revenue collection in Greece and GCC countries

respectively.

7. Policy Implication
For the case of Pakistan this paper lifts a very pondering suggestion for policy makers that Pakistan is not an economy where impositions of taxes are decided on basis of allocated govt. spending but it is the tax revenue for the past fiscal year(s) collected by the government which decides the amount of government spending and the annual fiscal policy. Thus the policy maker should not recommend an increase in taxes to reduce the fiscal deficit because in case of Pakistan an increase in taxes increases the govt. spending and hence, fiscal deficit that is then translated as an un necessary economical burden for its economy which is already smashed by the inflations and lending from world bank and IMF etc.

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