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The Relationship between Federal Government Revenues and Expenditures in Pakistan

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I. INTRODUCTION

A sound fiscal policy is important to promote price stability and sustain growth in output and employment. Fiscal policy is regarded as an instrument that can be used to lessen short-run fluctuations in output and employment in many debates of macroeconomic policy. It can also be used to bring the economy to its potential level. If policymakers understand the relationship between government expenditure and government revenue, continuous government deficits can be prevented. Hence the relationship between government expenditure and government revenue has attracted significant interest. This is due to the fact that the relationship between government revenue and expenditure has an impact on the budget deficit. The causal relationship between government revenue and expenditure has remained an empirically debatable issue in the field of public finance. The question of which variable takes precedence over the other has been a central issue to this debate.

On the theoretical front, several hypotheses have resulted from the causal relationship between government revenue and government expenditure. The first hypothesis is the *Revenue-Spend* hypothesis where raising revenue leads to more expenditure. The causality runs from government revenue to government expenditure. The second hypothesis is *Spend-Revenue* which states that changes in government expenditure cause changes in government revenue. This hypothesis was advocated by Peacock and Wiseman (1979). The third hypothesis is *Fiscal Synchronisation* which states that government revenue decisions are not made in isolation from government expenditure decisions. The decisions are made concurrently. The causality runs from both directions (bi-directional causality). Finally, Wildavsky (1988) and Baghestani and McNown (1994) have advanced a so-called *Institutional Separation* hypothesis under which decisions on taxation are taken independently from the allocation of government expenditure, such that no causal relation between revenue and spending is to be expected.

Narayan and Narayan (2006) gave three reasons why the nature of the relationship between government expenditure and government revenue is important. The first one states that if the revenue-spend hypothesis holds, budget deficits can be avoided by implementing policies that stimulate government revenue. The second reason states that if the bi-directional causality does not hold, it suggests that government revenue decisions are made independent from government expenditure decisions. This can cause

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high budget deficits should government expenditure rise faster than government revenue. The third reason is that if the spend-revenue hypothesis holds it suggests that the government spends first and pay for this spending later by raising taxes. This will result in the fear of paying more taxes in the future and encourage the outflow of capital.

The relationship between government expenditure and government revenue has been investigated for a number countries. Studies such as Von Fursterburg, Green and Jeong (1986); Anderson, Wallace and Warner (1986) revealed evidence of causality from government expenditure to government revenue for a number of developed countries. This study was supported by Nararayan and Narayan (2006) for Peru and provided evidence of the spend-revenue hypothesis. Other studies found evidence of causality running from government revenue to government expenditure (such as Manage and Marlow, 1986). Narayan (2006) also found evidence of causality from revenue to expenditure for Mauritius, El Salvador, Haiti, Chile and Venezuela. These studies provided evidence of the revenue-spend hypothesis. A number of Studies found evidence of the fiscal synchronisation hypothesis [such as Owoye (1995); Li (2001); Fasano and Wang (2002); Gounder, Narayan, and Prasad (2007)]. They found evidence of bi-directional causality between government expenditure and government revenue.

Despite the fact that the relationship between government revenue and government expenditure is important to evaluate, empirical research on this issue in Pakistan is scarce. Two studies, Hussain (2005) and Aisha and Khatoon (2010) while examining the causal relation between Government expenditure and Tax Revenue and between Government expenditure and Government revenue found unidirectional causality from expenditure to revenue. The objective of this study is to reexamine the issue and tests the validity of the various hypotheses for the period 1978-79 to 2008-09. The rest of the paper is organised as follows. Section 2 presents some features of the revenues and expenditures at the federal level in Pakistan. Section 3 discusses the estimation technique and methodology. Section 4 discusses the results, while Section 5 concludes.

II. FEDERAL REVENUES AND EXPENDITURES IN PAKISTAN

It would be useful, before the formal analysis, to look at some characteristics of the revenues and expenditures at the federal level in Pakistan. We start by looking at Figure 1 showing the Federal Budget.

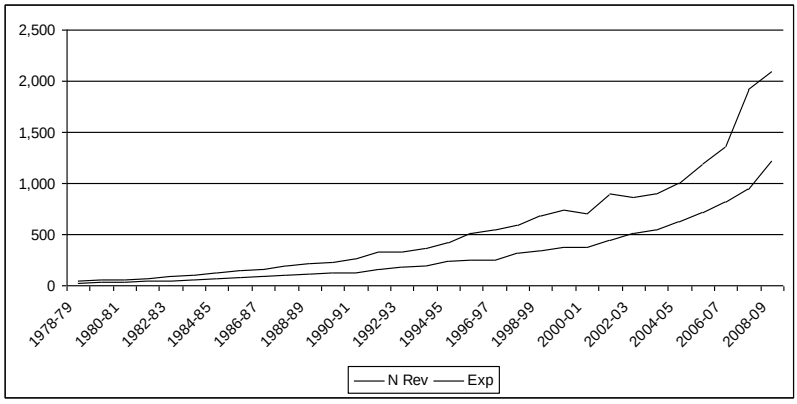

Fig. 1. Federal Budget (in bill Rs)

It can be seen that the gap between net revenues and expenditures increases with the time. It was around quarter bill in late 70s but jumped to Rs 136 bill by 1990-91. With in few years it increased to Rs 258 bill in 1995-96 and then to Rs 343 bill in 1998-99. It approached to trillion in 2007-08 when it was Rs 975 bill. We now look at the composition of revenues by tax and non tax shown in Figure 2.

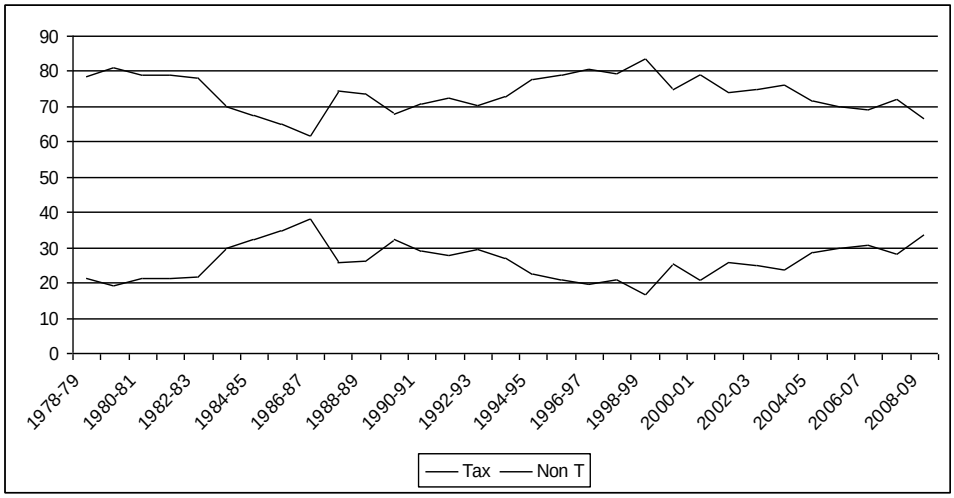

Fig. 2. Composition of Federal Revenues by Tax and Non Tax

The figure shows that in late 70s about 80 percent of the Federal Revenues came from Taxes. However, it gradually came down to 70 percent in 1983-84 and then to 62 percent in 1986-87. In 1990s the share of taxes remained between 70 to 80 percent until it reached 83 percent in 1998-99. After that it gradually came down to 66 percent in 2008-09. The composition of revenues by transfers to provinces and retained by federal is shown in Figure 3.

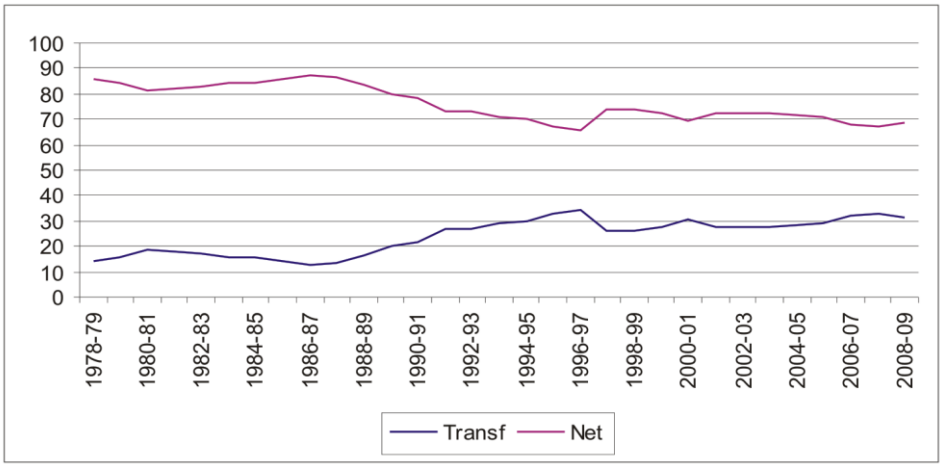

Fig. 3. Composition of Federal Revenues by Transfers and Net

It can be seen that until 1989-90 less than 20 percent of the revenues were transferred to the provinces. In 1991-92 the transfers increased to 27 percent and then to 34 percent by 1996-97. However, it came down after that and remained closed to 30 percent till.

Now we look at the expenditure side. Figure 4 shows the composition of expenditures by current and development.

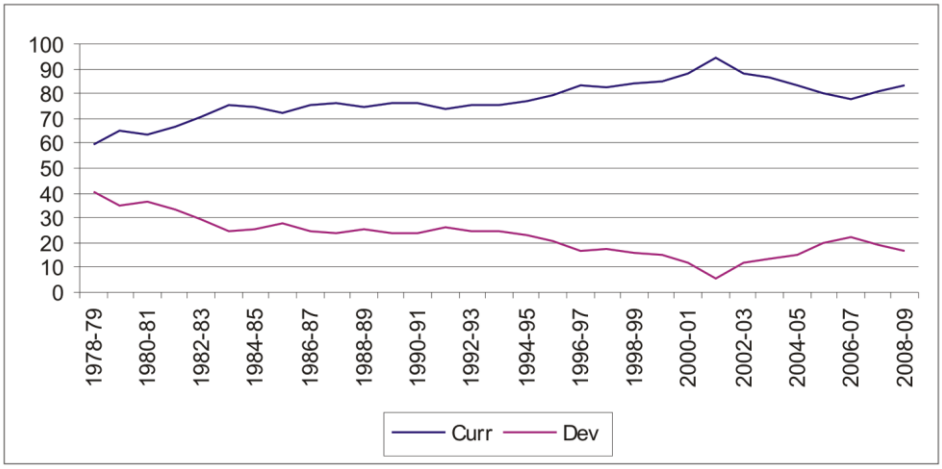

Fig. 4. Composition of Federal Expenditures by Current and Development

In late 1970s the share of development expenditure at Federal level was around 40 percent that gradually came down to 30 percent by 1982-83 and further to 20 percent by mid of 1990s. In 2001-02 it was as low as 5.6 percent. It followed an increasing trend thereafter but still remains below than 20 percent.

Next we look at how much Federal expenditures are met by their revenues shown in Figures 5–7.

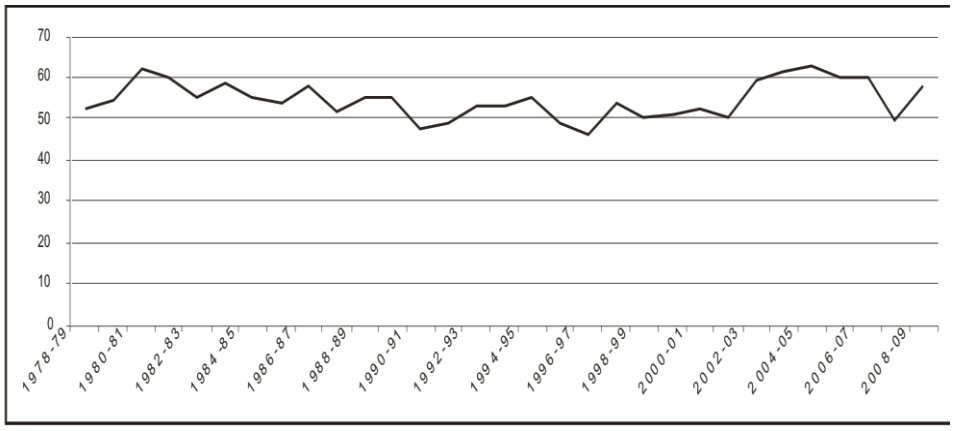

Fig. 5. Financing of Total Expenditures by Net Revenues

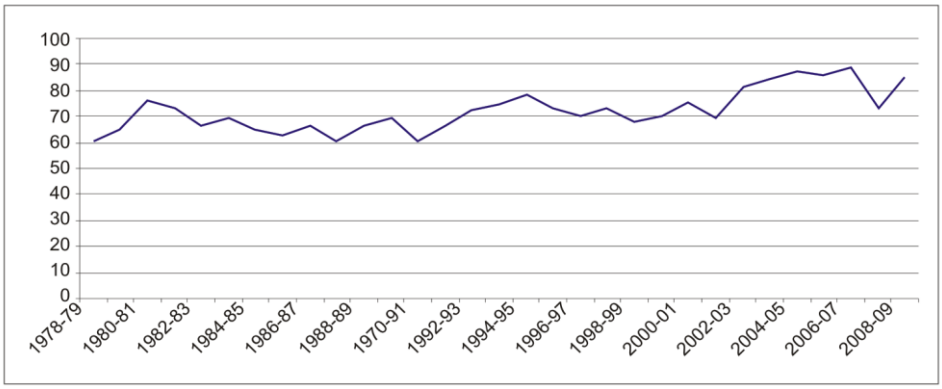

Fig. 6. Financing of Total Expenditures by Total Revenues

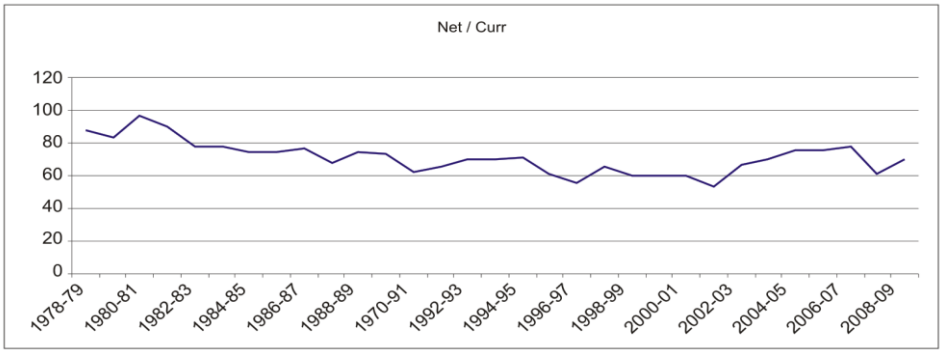

Fig. 7. Financing of Current Expenditures by Net Revenues

It can be observed that, in general, the expenditures at the Federal level are met by 50 to 60 percent of the net revenues. However, in terms of total revenues it shows an increasing trend. In 1980s it ranged between 60–70 percent which was increased to 70–80 percent in 1990s and then to over 80 percent in 2000s. If we look at the current expenditures about 60–80 percent of it is generally met by net revenues.

III. METHODOLOGY

The relation between revenues and expenditures is formally investigated by applying Causality analysis suggested by Toda and Yamamoto (1995) which is described as follows. In Granger sense the causality test is conventionally conducted by estimating Autoregressive or Vector Autoregressive (VAR) models. Granger non-causality test used Wald F-test in an unrestricted VAR model to test the joint significance of some parameters. Sims, *et al.* (1990) and Toda and Phillips (1993) studies have shown that when time series data are integrated or cointegrated then F-test for Granger non-causality is not valid as the test does not have a standard distribution. Toda and Yamamoto (1995) and Dolado and Lütkepohl (1996) proposed the modified Wald test (MWALD) for testing restriction on the parameters of VAR model. In order to apply Toda and Yamamoto (T&Y) approach information about true lag length and maximum order of

integration d_{max} is required but it does not require pre-testing for the cointegration properties of system [Shan and Tian (1998); Zapata and Rambaldi (1997)].

T&Y has shown that pretesting for cointegration rank in Johansen type ECM are sensitive to the values of the nuisance parameters , thus causality inference may be severely biased. Toda and Yamamoto procedure is to fit the Autoregressive or VAR in the level of the variable rather than first difference as in Granger non-causality test. The basic idea of TY approach is to artificially augment the correct order *k*, of the VAR model by maximal order of integration, say d_{max} Once this is done a VAR model with (d_{max} + *k*) order is estimated and then coefficient of last lagged vector are ignored means exclude extra added lags and apply the standard Wald test to test the restriction on the parameters. Specifically we estimate

$$Y_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} X_{t-i} + \sum_{i=n+1}^{d_{\max}} \alpha_{2i} X_{t-i} + \sum_{j=1}^{m} \phi_{1i} Y_{t-j} + \sum_{j=m+1}^{d_{\max}} \phi_{2i} Y_{t-j} + \varepsilon_{t1}$$

$$X_t = \delta_0 + \sum_{i=1}^{k} \delta_{1i} X_{t-i} + \sum_{i=k+1}^{d_{\max}} \delta_{2i} X_{t-i} + \sum_{j=1}^{l} \varphi_{1i} Y_{t-j} + \sum_{j=l+1}^{d_{\max}} \varphi_{2i} Y_{t-j} + \varepsilon_{t2}$$

The initial lag length *n*, *m*, *k*, and *l* are chosen using AIC criterion, whereas e_{1t} and e_{2t} are error terms. From 1st equation, Granger causality from *X* to *Y* implies $\alpha_{1i} \neq 0$; similarly in 2nd Equation Y Granger cause *X*, if $\varphi_{1j} \neq 0$. T&Y proves that Wald statistic used converges in distribution to a 2χ , no matter whether the process is stationary or non-stationary and whether it is cointegrated or not .

IV. RESULTS

In formal causality analysis we use two types of revenues, that is, total and net revenues. The former implies the revues left to the federal government after transfers to the provinces. Similarly two types of expenditures, that is, total and current expenditures are used. Using annual data on Federal Government of Pakistan's Revenues and Expenditures from 1978-79 to 2008-09 we obtain the following results.

Table 1 presents the results when total expenditures type is used. It can be clearly seen that both types of revenues, total and net, are caused by total expenditures but not vice versa implying clear evidence of a unidirectional causality from expenditures to revenues.

Table 1

Causality between Revenues and Total Expenditures

Dependent Variable: Total Revenue				Dependent Variable: Net Revenue			
Variables	Coeff.	t-values	Prob.	Variables	Coeff.	t-values	Prob.
Const.	–5.883	–0.878	0.389	Const.	–8.393	–1.350	0.189
TR(–1)	0.859	3.830	0.001	NR(–1)	0.664	2.670	0.013
TE(–1)	0.168	2.340	0.028	TE(–1)	0.252	3.960	0.001
Dependent Variable: Total Expenditure				Dependent Variable: Total Expenditure			
Const.	10.277	0.562	0.580	Const.	–9.690	–0.501	0.621
TR(–1)	0.073	0.118	0.907	NR(–1)	–0.340	–0.438	0.665
TE(–1)	0.246	1.250	0.223	TE(–1)	0.500	2.520	0.019
Conclusion: Undirectional from Expenditure to Revenue				Conclusion: Undirectional from Expenditure to Revenue			

The results with the other type, that is, the current expenditures are presented in Table 2.

Table 2

Causality between Revenues and Current Expenditures

Dependent Variable: Total Revenue				Dependent Variable: Net Revenue			
Variables	Coeff.	t-values	Prob.	Variables	Coeff.	t-values	Prob.
Const.	4.001	0.552	0.586	Const.	–5.426	–0.845	0.406
TR(–1)	0.705	3.440	0.002	NR(–1)	0.467	1.890	0.070
TE(–1)	0.257	4.010	0.001	TE(–1)	0.314	5.330	0.000
Dependent Variable: Total Expenditure				Dependent Variable: Total Expenditure			
Const.	29.292	1.250	0.224	Const.	1.048	0.044	0.965
TR(–1)	1.123	1.690	0.104	NR(–1)	0.316	0.349	0.730
TE(–1)	0.234	1.130	0.270	TE(–1)	0.556	2.570	0.017
Conclusion:				Conclusion:			
Undirectional from Expenditure to Revenue				Undirectional from Expenditure to Revenue			

It is clearly observed that the results are not different from the previous table, that is, causality runs from expenditures to revenues with out any feed back. Hence it can be concluded that the results support the Barro hypothesis for Pakistan, that is, government expenditures cause's revenues. This means that government first spends and then, later, to pay for this expenditure, it raises taxes.

V. CONCLUSION

This paper investigates the relation between expenditures and revenues at the federal level of the government of Pakistan for the period 1978-79 to 2008-09 using the Toda and Yamamoto (1995) methodology. The results show that there is a unidirectional causality from expenditures to revenues. The results revealed evidence of the *spend-revenue* hypothesis for Pakistan. This suggests that government first spends and then, later, to pay for this expenditure, it raises taxes. Potential investors may construe this government behaviour negatively—that is, investment decisions may take into account the possibilities of paying higher taxes in future.

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