Fiscal Responsiveness, Persistence and Discretion: A Case Study of Pakistan

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The main objective of this study is to analyses the fiscal policy conditions in Pakistan; in case of output change (fiscal responsiveness), effect of last year policy on this year(fiscal persistence) and finally fiscal discretion, through a 2SLS method the study period consist of 1972 to 2010. The main finding of the study is government expenditures are more responsive in case Pakistan which is the main cause of this fiscal imbalances and also indicating an unstable fiscal stance.

Keywords: Efficiency; Optimal Taxation, National Government Expenditures and Related Policies, Pakistan, Fiscal Policy
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1. Introduction

Pakistan's economy is facing severe economic deterioration and fiscal distress due to a very low level of tax to GDP ratio and high budget deficit in the contemporary world, excessive government spending become a mother of economics crisis and leading to the fiscal deterioration, for combating with this problem policy makers should know the fiscal response to output conditions and its past values. Hence the basic theme of the present endeavourer to evaluate the various fiscal stabilization processes that could be undertaken to mitigate fiscal distress for Pakistan.

Although several empirical efforts have been made to repeal the situation and to provide a framework to the policy makers for effective and efficient fiscal stance for the country; the present study examines the different aspects of fiscal policy in Pakistan by using a new approach based on Fatas and Mihov (2003, 2006) and Afonso et al (2008); to examine what extent the main characteristics of fiscal policy behaviour, such as the sensitivity of fiscal variables to economic developments, dependence of fiscal behaviour on its own past developments and impact on the patterns of both government spending and revenue, thereby determining conditions of fiscal sustainability or fiscal deterioration. In order to address our problem, we decompose government expenditures and government revenue into three components: Responsiveness, Persistence and Discretion. Responsiveness, can be defined as the response of fiscal policy to output, while persistence reflects the likely autocorrelation on budgetary policy decisions, given that we are interested in testing whether and to what extent the time-varying behaviour of the fiscal policy characteristics may simultaneously influence the patterns of both expenditure and revenue and eventually determine conditions of fiscal deterioration, we need to estimate a specification including both the expenditure and revenue equations, and discretion means the part of government spending and revenue that does not correspond to

systematic responses to output conditions and in past values of government spending and revenue, but instead the consequence of exogenous political processes or extraordinary non-economic circumstances.
The remainder of the study consists of, section 2 presents review of previous studies, section 3 based on data and methodology, section 4 illustrates empirical results and discussion and finally conclusion will be drawn in section 5.

2. Review of Literature

The empirical research, mainly on industrial countries, showed under what conditions fiscal consolidation leads to economic growth. Giavazzi and Pagano (1990) discussed the fiscal consolidation and showed that it is expansionary in case of high debt. Moreover, Alesina and Perotti (1995) and Alesina and Ardagna (1998) studied the persistence and size of the fiscal impulse, the composition of budget also an important factor in making private sector response to fiscal policy and growth.
From the supply-side fiscal policy linked with investment through the wage levels (Alesina, Ardagna, Perotti, and Schiantarelli, 1999). The decision of investment based on the shadow value of capital, and this value based on marginal product of capital (MPK); and MPK has a negative relationship with wage rate. Expectation also affects the investment decision, and the higher current or expected taxes on labor, the higher post-tax equilibrium wages, which reduce the expected profits and investment. Giavazzi and Pagano (1990) emphasized that private investment and consumption may increase by reduction in fiscal deficit through a wealth effect; a low level of deficit means a reduction in future taxes, and increases the present value of income or wealth, which will further boost the private consumption and investment and stimulate the growth. There is another channel through which private investment is increased due to reduction in

deficit, since this reduction indicates political stability as discussed (Drazen, 2001)[4].

The modern empirical work on growth has generated different models which provide a link between government spending and the long run growth, many other studies discussed the size effect of government on growth; such as [Barro and Sala-i-Martin (1995), Agell, Lindh and Ohlsson (1997), Barro (1990), Cashin (1995), Deverajan, Swaroop and Zou (1996), Kocherlakota and Yi (1996, 1997), Easterly and Rebelo (1993), Mendoza, Milesi-Ferretti, and Aseaet (1997), Miller and Ressek (1997), Kneller, Gupta, Clements, Baldacci, and Mulas-Granados (2002) and Bleany and Gemmell (1999)].

Another important and contemporary issue is related to the efficiency and usefulness of government activities, different empirical studies have been conducted regarding fiscal allocation function, stabilization and distributional effect of public expenditures, some other studies focused on the role of different regulation policies, institutional setup and privatization effect [Rodrik (2000), Mueller (1997), Persson and Tabellini (2001), Gwartney et al. (2002), Shleifer and Vishny (1998), Strauch and Von Hagen (2000)]. Many of them concluded that public spending though smaller but more efficient. In the last decade, empirical research focus on a new dimension of fiscal policy that is responsiveness of fiscal policy i.e. the behavior of government revenues and government expenditures due to change in output conditions; including what are the major determinants of this responsiveness; the result of these studies can be concluded as for developed countries fiscal policy is countercyclical or a-cyclical [Afonso and González Alegre (2008), Galí (1994); Fiorito and Kollintzas (1994); Fiorito (1997); Afonso (2008); Hallerberg and Strauch (2002)], but in the case of developing countries fiscal policy

4 there is political motive also of fiscal policy specially in developed countries to effect the election (Economides, Philippopoulos, and Price, 2003).

was pro-cyclical [Braun (2001); Gavin and Perotti (1997a), (1997b); Kaminsky et al. (2004); Talvi and Vegh (2005)]. Many other tried to find the reasons, why fiscal responsiveness varies? Among the countries, their research pointed out that except the macroeconomic variables political and institutional setup are the main source of this cross-country variation. In particular, Persson (2001) and Persson and Tabellini (2001) identified that fiscal policy cyclicality based on parliamentary and majority based systems. Alesina et al. (2008) identified that corruption is the main cause in developing countries of the pro-cyclicality of fiscal policy, Lane (2003) for OECD countries identified that pro-cyclical fiscal policy is mainly due to dispersed political power.

Some other examined the fiscal discretion; which is related to the segment of fiscal policy that does not respond systematically to output conditions. Fatás and Mihov (2003) examined the main factors of fiscal discretion and its effect on economic condition; in this regard they performed a cross-country analysis among 91 countries, the main variables they incorporated as determinant of fiscal discretion are political and institutional, further more they estimated the effect of discretion on economic growth and output volatility. The results showed that better institutions constrain discretionary spending and promote economic growth and reduce the instability. More recently, Fatás and Mihov (2006) explored the discretionary effect of fiscal rules and institutions and also examined the responsiveness of fiscal policy.

Earlier empirical studies in Pakistan revolved around the discussion about the relative importance of fiscal and monetary policy on aggregate economic activity (Hussain, 1982; Massood and Ahmad, 1980; and Saqib and Yasmin, 1987). Some other worked on Public and external debts sustainability [Tahir et. al, (2009); Hassan (1999); Chaudhary and Anwar, (2000); Siddiqui and Malik, (2001); Jafri, (2008)]. Moreover, other studied whether tax-smoothing behavior is consistent with the fiscal policies of Pakistan [Nadeem ul Haque

(2002)]. Many discussed the crowding out in Pakistan, Looney (1995) and Hyder (2001). A latest study conducted by Rozina and Turner (2010) where they studied the dynamic effects of shocks in government spending and taxes on macroeconomic variables in Pakistan.

3. Data and Methodology

In order to measure the fiscal Persistence, Responsiveness and Discretion in government spending and revenue the following two different set of equations are used following the work of Fatas and Mihove(2003,2006) and Afonso et al (2008)

$Ln(G_t) = \alpha_1 + \beta^G ln(Y_t) + \gamma^G ln(G_{t-1}) + \varepsilon_t^G$----(1)

$Ln(R_t) = \alpha_2 + \beta^R ln(Y_t) + \gamma^R ln(R_{t-1}) + \varepsilon_t^R$-----(2)

Where:

G = Real government spending.
R = Real government revenue.
Y = Real GDP.
β^G = is the measure for Responsiveness of Government Spending
β^R = is the measure for Responsiveness of Government Revenues
γ^G = is the measure for Persistence of government spending
γ^R = is the measure for Persistence of government Revenues
ε = is the error term

To measure the quantitative value of fiscal discretion the volatility of residuals is calculated as $\sqrt{\varepsilon}R$ and $\sqrt{\varepsilon}G$, for discretionary effect of revenues and discretionary effect of spending respectively.

Two stages least square method (2SLS) is applied to estimate the above equations, because of autoregressive nature OLS estimate would be biased and inconsistent; possibly real GDP may have correlation with the residual terms and there might be some measurement error exist. For avoiding the discussed endogeneity problem and biasness we used 2SLS and real GDP as instrumented

with two lags of GDP and the lagged value for revenue and spending, respectively in the spending and revenue equation (Afonso, 2008) and (Loloh, 2011).

The study consist on annual data from 1972 to 2010, all the variable taken from various issues of economics survey of Pakistan and converted into real form by CPI factor based 2000-01.

4. Empirical Results and Discussion

To find out the fiscal policy responsiveness, persistence and discretion; equations 1 and 2 are used and to secure the results from spurious regression problem a unit root test is applied for checking the stationarity of the data. The results depict in the table 1 which demonstrate that according to Augmented Dickey-Fuller (ADF) test all the variables have the same order of integration that is I(1).

Table 1

Unit Root Test

	At levels			First difference		
		(ADF)*			(ADF)*	
Variable	Lags	Test Statistics	Prob	Lags	Test Statistics	Prob
LRGDP	0	0.17885	0.9676	0	-6.442395	0.000
LRTR	0	-1.540828	0.5024	0	-6.829277	0.0000
LRTE	0	-1.877380	0.3390	0	-5.528851	0.0000
* Critical Value: -3.621, Null Hypothesis: Variable has a unit root Source: Authors' estimation						

LRGDP is log of real GDP, LRTR is log of real tax revenue

LRTE is the log of real government expenditures

After the confirmation of stationarity in the next step equation 1 is estimated for government expenditures responsiveness, persistence and discretion and the results are mentioned in the table 2 here the coefficient of γ^G is showing the persistence of expenditures, β^G is the responsiveness of expenditures and ε^G is the discretion of expenditures which is the standard deviation of the residual series. The

results of diagnostic tests of the model are mentioned in the lower part of thebale 2; Breusch-Godfrey Serial Correlation Lagrange Multiplier (LM) Test evident that there is no multicollinearity and the White and ARCH both are showing that there is no Heteroskedasticity and error term have a constant variance as the probability of both test is more than 10%. Finally the Jarque-Bera used to check the normality and the probability shows that data is normally distributed.

Table2

Expenditures Equation 1

Dependent Variable: LRTE				
Method: Two-Stage Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.9692	0.4448	2.1786	0.0364
γ^G(Persistence)	0.5302	0.1914	2.7687	0.009
β^G(Responsiveness)	0.3508	0.1506	2.3289	0.0259
ε_t^G(Discretion)1	0.0849	----	-----	----
R-squared	0.9709	Mean dependent var		12.9803
Adjusted R-squared	0.9692	S.D. dependent var		0.4987
F-statistic	546.4378	Durbin-Watson stat		1.350
Prob(F-statistic)	0	Second-Stage SSR		0.5949
Diagnostic Test				
Breusch-Godfrey Serial Correlation LM Test:			3.403	0.1824
Heteroskedasticity Test: White			9.190	0.1017
Jarque-Bera			1.833	0.3998
Heteroskedasticity Test: ARCH			0.8617	0.3533

Source: Authors' estimation

Next, to estimate the government revenue responsiveness, persistence and discretion equation 2 is used through the defined econometric technique, and the results are mentioned in the Table 3 here the

coefficient of γ^R is showing the persistence of revenue, β^R is the responsiveness of revenue and ε^R is the discretion of revenue which is the standard deviation of the residual series. The results of diagnostic tests of the model are mentioned in the lower part of the tabale 2; Breusch-Godfrey Serial Correlation Lagrange Multiplier (LM) Test evident that there is no multicollinearity and the White and ARCH tests are showing that there is no Heteroskedasticity and error term have a constant variance as the probability of both test is more than 10%. Finally the Jarque-Bera used to check the normality and the probability shows that data is normally distributed.

Table.3

Revenue Equation 2

Dependent Variable: LRTR				
Method: Two-Stage Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.4344	0.3548	1.2244	0.2292
γ^R(Persistence)	1.1103	0.1758	6.3125	0
β^R(Responsiveness)	-0.1198	0.1674	-0.7153	0.4793
ε_t^R(Discretion)	0.0643	-----	-----	-----
R-squared	0.9884	Mean dependent var		12.5994
Adjusted R-squared	0.9877	S.D. dependent var		0.5990
F-statistic	1430.749	Durbin-Watson stat		2.1887
Prob(F-statistic)	0	Second-Stage SSR		0.3674
Diagnostic Test				
Breusch-Godfrey Serial Correlation LM Test:			0.9407	0.6248
Heteroskedasticity Test: White			2.1852	0.823
Jarque-Bera			0.6818	0.7111
Heteroskedasticity Test: ARCH			0.0501	0.8228

Source: Authors' estimation

Fiscal Responsiveness

The results show that the coefficient of government expenditures is significantly higher than the coefficient of revenue responsiveness which is negative and also insignificant; this indicates that government expenditures are more responsive in the case of Pakistan than the tax revenue, and an increase in the output will also increase the expenditures and reduces the revenue. This positive responsiveness of implies that in the case of economic slowdown, expenditures adjust accordingly but the revenues are not, so the fiscal policy in Pakistan is sustainable just in the case of expenditures. Furthermore the magnitude of the coefficient of expenditure responsiveness is much higher than revenue which indicates a fiscal imbalance or deficit in the case of Pakistan.

Fiscal Persistence

As far as fiscal persistence concern the result show that government revenue are more persistence than the government expenditures; since the coefficient of revenue is much greater than the coefficient of expenditures and both are positively influenced by their past value; indicating a relatively unstable fiscal policy.

Fiscal Discretion

Fiscal discretion is measured by standard deviation of residual series of both models, according to this approach if persistence and responsiveness is higher and significant the discretion will be low, due to this reason, the results indicate that fiscal discretion is very low and in relative terms it is higher in expenditure model.

5. Concluding Remarks

This paper focused on fiscal sustainability in Pakistan; through a Two Stage Least Square (2SLS) Method by disentangle the fiscal policy into three parts i.e. Responsiveness, Persistence and Discretion. The results show that as government expenditures are more responsive to output situation than revenue (which is negative here) indicating a severe budget deficit, this is also indicating that automatic fiscal stabilization process is not working in Pakistan due to negative sing on revenue responsiveness, that is, in case of recession taxes will be higher. Furthermore, the revenue and expenditures are positively influenced by their lag values (Persistence) which is also indicating an unstable situation in Pakistan. Finally government needs to readjust tax structure and a fair tax reform is necessary to impede this problem.

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