Impact of Institutions on Budget Deficit: The Case of Pakistan

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Abstract

Weak institutions are root cause of mismanagement in public resources which lead to high budget deficit. In such conditions the budget deficit becomes a source of depressed economic growth, high seignorage inflation, crowding out of private investment. To find the effect of institutions on budget deficit of Pakistan present study empirically investigates the impact of institutional quality on budget deficit for the period 1984 to 2014. The long-run estimates indicate that trade openness and inflation have positive effect on budget deficit. However, real per capita output has insignificant effect. Nevertheless, when the institutional variables i.e. corruption, law and order, political stability and military in politics are included in the model, real per capita output shows significant effect on budget deficit. This specifies that economic factors alone cannot determine the budget deficit of an economy. The results indicate that higher corruption, poor institutional quality and deteriorated law and order situation have can increase the budget deficit. However, political stability can have a positive effect on budget balance. It is suggested that policy makers should pay attention to improve institutions quality to improve the budget deficit.

Keywords: budget deficit, institutions, co-integration, trade openness

Introduction

Fiscal expansion is considered as an important requirement to attain macroeconomic stability and economic growth. In most of the developing countries monetary expansion is associated with government borrowing from banking system and from international sources (Aghevli, 1975), Otani & Park (1976) and Aghevli & Khan (1976)). Budget deficit is also considered a source of low growth, high inflation, crowding out of private investment and current account deficit (Chaudhary & Abe 1999). In developing countries, governments mostly rely on deficit financing because of their inability to mobilize the domestic resources and broaden narrow tax base (Tanzi, 1982). Monetarists' view is that the monetization leads to an increase in money supply and ultimately higher inflation in long-run (Gupta, 1991). Therefore, budget deficit can hinder the economic growth and development of an economy.

Pakistan's budget has been restricted by increasing expenditures and low revenue resources because of huge dependence on indirect taxes, lack of government control over resources and public debt burden (Padda & Akram, 2009). Fiscal deficit in Pakistan amplified from 2.1% of GDP in 1960s to 5.3% in 1970s and then boosted up further to 7.1% in 1980s. Even though some half-hearted attempts were tried in 1990s to bring the budget deficit around 4% of GDP but it continue to be remained high at 6.9% of GDP relatively lower than the deficit of 1980s. However, the budget deficit is averaged 4% during 2001-2010. Nevertheless, the fiscal budget was down from an average of 7.4% of GDP from 2010-2013 to 5.5% of GDP in 2014. This enhancement caused due to higher non-tax revenues and lower-than-targeted development spending (GoP Report, 2015).

Initially budget deficit is considered as a macroeconomic phenomenon but over the time with the emergence of political economics it is realized that political and institutional variables do influence the budget deficit. According to Alesina & Perotti (1996) economic theory only cannot describe the budget deficit. Political and institutional factors are also determining the deficit. Henisz (2004) suggested that the existence of institutional checks can improve the economic outcomes. Therefore, institutional and political variables like law and order, corruption and political stability are included as explanatory variables in the economic models and then tried to observe their effect on budget deficit (Woo, 2003; Fatas & Mihov, 2010). Many empirical studies have been conducted that investigate the relationship between macroeconomic variables and budget deficit only in case of Pakistan Agha & Khan (2006), Mukhtar & Zakaria (2010) and Hassan, & Kalim (2012) observed the effects of macroeconomic variables i.e. money supply, GDP per-capita and inflation on budget deficit respectively.

The main objective of present study is to empirically investigate the factors that can influence the budget deficit of Pakistan for the time period of 1984 - 2014. The present study adds to the existing literature by observing not only the economic, as well as, institutional variables which can influence budget deficit. The study identifies the effects of real GDP per-capita, inflation and increased trade openness on the budget deficit. The analysis observes the quantitative effect of political instability on budget deficit by considering the role of corruption, law & order and military role in politics. The results indicate that inflation and trade openness are positively related with budget deficit and as the institutional variables are included the results indicate that higher corruption, poor institutional quality and law and order situation can increase the budget deficit.

<div align="center">**Literature Review**</div>

This section consists of two parts. The first part presents theoretical background and the second part presents empirical literature regarding budget deficit and its determinants.

Theoretical Background

Budget deficit is generally identified as the gap between revenue and expenditure. Mainly, there are three schools of thought regarding implications of budget deficit. First is Neo-classical approach, second Keynesian and the third is Ricardian approach. According to the Neoclassical approach increase in budget deficit leads to higher interest rate due to higher demand for loanable funds which discourages the private investment, resulting in higher inflation and lastly slows down the growth rate of economy through resource crowding-out.

According to Keynesian approach, budget deficit results in higher domestic production, increase in aggregate demand, higher savings and investment at given interest rate. It is argued that budget deficit leads to higher domestic production, which encourages the private investor to invest more that creates crowding-in[1] effect. Lastly, the central Ricardian argument is that deficit simply postpones present taxes to future (Bernheim, 1989). This approach suggests that budget deficit does not affect the overall demand in an economy.

According to the theory, governments either finance the spending by imposing the tax on taxpayers or it can borrow money. And this borrowing ultimately has to be paid by increasing the tax in future. So actually a choice has to be made between tax now and tax later. If the government finances the spending by borrowing, resulting in more money for tax payers, so currently the taxpayers have more money to spend but they realize that they would have to pay more tax in future, so they try to save that money. This extra saving by tax payers will reduce the extra spending so the total demand remains the same (Padda, 2014).

Empirical Literature

Most of the studies examined the effect of macroeconomic variables on budget deficit but over the time it has been observed that other than economic variables; political and institutional factors do hamper the budget deficit volatility. Considering the influence of economic variables, most of the studies are country specific e.g. Lozano (2008) studied the long-run relationship between budget deficit, money supply and inflation in Colombia.

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[1] Crowding-in: is government spending increases the demand for goods which in turn increased the private sector spending.

The study indicates casual relation between money supply and budget deficit. Murwirapachena *et al.* (2013) identified the economic variables that influence the budget deficit of South-Africa, indicating that except foreign debt all other variables have a positive impact on budget deficit i.e. high unemployment rate, low level of economic growth, high government expenditures and low foreign reserves are the main determinants of budget deficit in South-Africa. Zonuzi *et al.* (2011) following the Pesaran *et al.* (2001) specified a positive significant relation between budget deficit and inflation in Iran.

Bayar & Smeets (2009) empirically analyzed the economic, institutional and political factors that influence budget deficit for the 15 European Union countries over the time period of 1971 to 2006. Multiple empirical techniques i.e. Panel Corrected Standard Errors (PCSE) and fixed effect methods are used to observe the effect of unemployment rate, GDP growth rate, debt-servicing cost, political and institutional variables on budget deficit. The results indicate that unemployment rate and debt servicing costs are positively associated with budget deficit. The effect of Maastricht treaty is significant on budget deficit indicating a reduction in deficit is witnessed in European countries, but the government fragmentation and ideology index are insignificant to budget deficit.

According to Alesina & Perotti (1996) economic theory only cannot describe the budget deficit. Institutional and political variables are the key factors to determine the issue, emphasizing the role of electoral system, government fragmentation, party structure and political polarization. Agnello & Sousa (2009) empirically analyzed the economic, political and institutional sources of budget deficit for 125 countries using panel data techniques. The results indicate that the political instability leads to an increase in budget deficit. Furthermore, the empirical findings suggest that country size and political regime are important determinants of budget deficit volatility. Additionally, higher inflation and degree of openness are significantly affecting the budget deficit. Javid *et al.* (2011), compares the ASEAN and South-Asian countries by investigating the effect of economic, political and institutional variables on budget deficit for four South- Asian and five ASEAN countries for the period of 1984-2010 using GMM technique The study indicates that openness, high inflation and high income level indicate high budget deficit. Considering the institutional variables political instability, corruption, law & order and conflicts also result in high budget deficit. However, results indicate that fluctuations in budget deficit are lower in ASEAN countries as compared to selected South-Asian countries. Žurauskas (2015) analyzed the effects of political corruption on budget deficit for 31 OECD countries from 1996-2013. Using the weighted least square model and control variables; GDP growth and old-age dependency ratio, the results indicate that higher corruption is associated with higher fiscal spending. At the

same time the GDP growth rate is significantly associated with budget deficit. In the case of Pakistan, very few studies are available. Mostly emphasizing the impact of economic variables on budget deficit and provide different results.

Anwar & Ahmad (2012) identified political variables that influence the budget deficit in case of Pakistan for the time period of 1976 to 2009. To identify the long-run relation co-integration and the error correction model (ECM) are used within the autoregressive distributed lag (ARDL) framework. The results specify that government size has positive and significant effect on the budget size, however, democracy helped in lowering down the budget deficit, even though the effect is weaker in case of Pakistan for the given time period. The literature review reveals that the role of institutional variables in determining the budget deficit cannot be ignored. However, there is little work available that evaluates the impact of political variables on budget deficit in case of Pakistan. So it would be interesting to explore the role of institutional variables in determining budget deficit in Pakistan.

Data and Methodology

Model

This paper focuses on the economic and institutional variables that can influence budget deficit. To observe the impact on budget deficit following model has been developed:

$$BD_t = f(ECON_t, INST_t) \quad\quad\quad\quad\quad\quad\quad\quad\quad\quad (1)$$

Where BD is the budget deficit for the period t, ECON is the vector of economic variables and INST is the vector of institutional variables for the time period t. The economic variables are real GDP per capita (RGDP), Inflation (INF), Trade Openness (OPEN). While the political variables include Corruption (COR), Law and Order (LAW), Political stability (PS) and Military in politics (MP).

Real GDP per-capita is used to evaluate the level of economic development. It is expected that there exists a negative relation between budget deficit and real GDP per capita (Fatas & Mihov, 2006). The variable of inflation is included to measure the uncertainty in an economy. Inflation affects the budget deficit through increased nominal interest payments. Inflation is predicted to have a positive relation with the budget deficit i.e. higher the inflation rate the grater will be the budget deficit. OPEN indicates the trade openness and is calculated as a ratio of aggregate of exports and imports to GDP. It indicates the extent to which an economy is open to external shocks. It is expected that the openness is positively associated with budget deficit.

The institutional variables include COR, an indication of corruption within the political system which can distort economic and financial environment, LAW represents law and order and indicate the effectiveness and neutrality of legal system, political stability (PS) shows strength of political system and military in politics (MP) is the involvement of military in politics that could decrease the democratic accountability and ultimately can result in distortion of government policy.

Data

This study uses annual data on economic and institutional variables for Pakistan from 1984-2014. The sources of economic data are World Development Indicators (WDI) and State Bank of Pakistan (SBP). However, institutional and political variables are obtained from International Country Risk Data Guide (ICRG). Economic variables indicate the structural distinctiveness of a country which include ratio of budget deficit to GDP, real GDP per-capita, inflation and trade openness.

To observe the effects of institutional variables on budget deficit, the study uses the political instability index created by ICRG by associating risk points to political risk components where corruption has given the 6 points, law and order has 6 points and military in politics has 6 points respectively. The minimum number of points given to any country is zero, the maximum number depend on the fixed weight assigned to that component in overall risk assessment i.e. lower the risk point total, the higher will be the risk and higher risk point total lower will be the total risk.

Estimation Techniques

To analyze the effect of macroeconomic and institutional variables on budget deficit of Pakistan first step is to check the stationarity of the data. Based on the unit root results appropriate technique will be applied.

Unit Root Test

Most of the macroeconomic time series data is trended and non-stationary that can lead to spurious regression. To check the issue of non-stationarity in data augmented Dickey-Fuller (ADF) unit-root test is used.

$$\Delta Y_t = \alpha + \varphi\, t + \Theta Y_{t-i} + \Sigma \phi_i\, \Delta Y_{t-i} + \mathcal{E}_t$$

Where Y is the variable under discussion, Δ is the first difference, t indicates the time period, $\mathcal{E}_t$ is the error term. The optimal lag length is identified to ensure that error term is white noise. If the null hypothesis $\Theta = 0$ cannot be rejected than it can be concluded that the variable under discussion has a unit-root and is non-stationary.

Co-integration Test

If the economic time series data is stationary i.e. integrated and of the same order than co-integration technique can be used. To observe the effect of

institutional variables on budget deficit, the co-integration technique is used. There are two co-integration techniques which are mainly used. The first one is the Engle-Granger (EG-1987) co-integration test and the other one is Johansen-Juselius (JJ, 1990) technique. The difference between the two approaches is that the EG test is the single equation approach which is used when there is single co-integrating relation among all the variables. Conversely, JJ technique is used when there are multiple co-integrating relations. However, JJ test is considered better than the EG test as it allows the occurrence of multiple co-integrating relations. In the present study JJ test is being used to identify the long-run co-integrating relation among the variables.

Johansen & Juselius (1990) and Johansen (1995) suggested that if the economic variables are integrated of order one than co-integration technique can be used. The co-integration indicates the existence or absence of long-run relationship among the variables.

Empirical Results

This section provides estimated results. Initially model 1 is estimated which observes the effect of macroeconomic variables on budget deficit, however, model 2 identify the effect on budget deficit when institutional variables are included along with macroeconomic variables.   First descriptive statistics is provided, after it unit root test and long run results are presented.

Descriptive Statistics

The analysis begins with the descriptive statistics of the data. Table 1 presents descriptive statistics of all the variables.

Table 1: *Descriptive Statistics (1980-2014)*

Variable Description	Mean	Std. Dev.	Min	Max
Budget Deficit (BD) (Budget deficit as percentage of GDP)	4.53	1.75	2.00	7.20
Real GDP per-capita (RGDP)	2.46	0.17	2.27	2.91
Trade Openness (OPEN) (Import plus exports as percentage of GDP)	0.32	0.05	0.16	0.38
Inflation (INF): (Change in CPI)	8.14	3.56	2.87	18.46
Corruption (COR): (Index (0-6)	1.96	0.38	1.00	3.00
Law & Order (LO): (Index (0-6)	2.68	0.74	1.00	3.91
Political Stability (PS): (Index (0-6)	0.36	0.68	2.55	5.24
Military in Politics (MP): (Index (0-6)	0.69	0.43	0.001	1.00

The table summarizes the descriptive statistics of budget deficit, real GDP per-capita, trade openness, inflation, corruption, law & order, political stability and military in politics for Pakistan for the period of 1980-2014. The table specifies that on average budget deficit during the given time period remained 4.53 percent of GDP and volatility is 1.75 and the range of

minimum and maximum is between 2% and 7.2%. The variable of real GDP per-capita indicate that on average the variation is 2.46% and the volatility is 0.17 and the range of minimum and maximum is between 0.02% and 0.029%. Likewise, the trade openness and inflation variables show that the average change during the given time period is 0.003% and 0.081% respectively. However, the volatility of these variables is 0.05 and 3.56 respectively. Additionally, in case of institutional variables the average change in corruption, law & order, political stability and military in politics is 1.96, 2.68, 0.36 and 0.69 respectively.

To check the stationarity of data Augment Dickey-Fuller (ADF) test is applied. The table 2 indicates the unit-root test results for the economic and institutional variables for budget deficit. The ADF unit root test for all the variables i.e. BD, RGDP, INF, OPEN, LAW, COR, PS, MP are all shown in the table below.

Table 2: *ADF-Test at Levels.*

Variables	Levels	Sig.	1st Difference	Sig.
BD	1.8972	(0.3291)	6.8620	(0.000)
RGDP	0.3343	(0.9763)	5.3935	(0.000)
INF	2.5004	(0.1254)	6.6088	(0.000)
OPEN	2.5392	(0.1167)	6.9356	(0.000)
LAW	1.2559	(0.6364)	4.1151	(0.003)
COR	2.4757	(0.1315)	5.6463	(0.000)
PS	1.2816	(0.6248)	4.1424	(0.003)
MP	1.8989	(0.3283)	4.0991	(0.0036)

The results of the unit-root in above table indicate that the null hypothesis of unit root is rejected when the ADF is applied to all the variables for the first difference. It means that all the variables are stationary at first difference i.e. I(1).

Lag Order Selection Criteria for Vector Auto Regressive Model

Vector Auto Regressive (VAR) model is used to determine the lag order selection in an empirical study. The common criterion is to compare the Schwarz information criterion (SC) values, the one which is minimum indicate the best lag order. The results indicate that optimal lag length should be one for both models.

Table 3: *Lag Order Selection for Estimated VAR*

Lag Order	Model 1	Model 2
0	4.5632	7.5786
1	2.3958*	4.6742*
2	3.5845	5.7787

Testing for Co-integration

To deal with the problem of spurious regression i.e. non-stationary time series data and develop the long run relation, co-integration technique is used. The test itself produces a number of statistics that can be used to determine the number of co-integration vectors present. There are two separate tests which are used to determine the number of co-integration relationships which are Maximum Eigen-values (λ max) and Trace-statistic (λ max).

Table 4: *Trace Statistics*

	Ho : r = 0	Ho :r ≤ 1	Ho : r ≤ 2	Ho : r ≤ 3	Ho : r ≤ 4
	H1 : r = 1	H1 : r = 2	H1 : r = 3	H1 : r = 4	H1 : r =
Model 1	99.2473*	44.8483*	12.1071	1.6483	
	[0.000]	[0.0034]	[0.1798]	[0.8461]	
Model 2	269.9690*	188.2079*	133.0211*	89.5404*	57.9683*
	[0.0000]	[0.0000]	[0.0002]	[0.0040]	[0.0216]

Table 5: *Max-Eigen Value*

	Ho : r = 0	Ho :r ≤ 1	Ho : r ≤ 2
	H1 : r = 1	H1 : r = 2	H1 : r = 3
Model 1	54.3989*	31.0929*	
	[0.0000]	[0.0023]	
Model 2	81.7610*	55.1868*	43.4806*
	[0.000]	[0.0055]	[0.0255]

Note: The * indicates significance level at 1%, ** indicates significance level at 5% and *** indicates significance level at 10% respectively. Value in parenthesis show the t-values

According to the above the mentioned results, trace statistic (λ max) indicate that two co-integrating relationships exist for the Model 1, however, for the Model 2 five co-integrating relations exist at 5% level of significance. Furthermore, Max-Eigen value (λ max) indicate that two integrating relation exist in model 1 on the other hand for the Model 2 three co-integrating relation exist at 5% level of significance.

Table 6: *Co-integration Results: budget deficit*

Model 1 BD = -0.193 RGDP + 0.538* INF + 14.457**OPEN
$\qquad$ (0.123) $\qquad$ (10.97) $\qquad$ (3.57)
Model 2 BD = 1.489***RGDP + 0.033*** INF - 4.643**OPEN + 4.916*COR +
$\qquad$ (1.54) $\qquad$ (1.19) $\qquad$ (2.12) $\qquad$ (18.30)
$\qquad$ 2.026* LAW – 1.897*PS – 0.005MP
$\qquad$ (8.96) $\qquad$ (7.68) $\qquad$ (0.02)

Note: The * indicates significance level at 1%, ** indicates significance level at 5% and *** indicates significance level at 10% respectively. Value in parenthesis show the t-values

The results of economic variables are stated in Model 1. The results specify that real GDP per-capita has insignificant effect on budget deficit of Pakistan. The real GDP per-capita expressed the degree of economic

development in the sample period. The negative relation between these two variables is consistent with the findings of Fatas & Mihov (2006) which shows that countries with lesser income have shorter and more volatile business cycles because of weak economic institutions and less developed financial markets. In addition, these countries normally choose discretionary fiscal policy Rand & Trap (2002). Secondly the coefficient of inflation is positively associated with budget deficit. The coefficient of inflation indicates the level of economic uncertainty. Inflation causes the uncertainty in government revenues and expenditures which ultimately influence the budget deficit. The results support the findings of Javid *et al.* (2011) and Agnello & Sausa (2009). The coefficient of trade openness shows a positive relation between trade openness and budget deficit. Trade openness indicates the exposure of economy to external shocks that can lead to deficit in budget. Change in import or export prices, in the case of developing countries, may have an impact on trade balance through import tariffs or profits of exports. The results are consistent with the study of Fatas & Mahov (2010) and Agnello & Sausa (2009) which also indicate that trade openness is positively associated with budget deficit.

To elaborate the role of institutional quality on the budget deficit institutional variables are included in the model 2. According to Alesina & Perotti (1996) economic theory only cannot describe the budget deficit. According to political economy theory, fiscal policy is dependent upon both political and institutional variables. The role of economic variables does not change much except for the coefficient of trade openness. Now the coefficient of trade openness is negatively associated with budget deficit. Nevertheless, the findings are consistent with the study of Combes & Sedik (2006) indicating that the negative relation between budget deficit and trade openness can be due to the channel of corruption as the country is more open to the shocks. To capture the effect of quality of political instability and government institutions which take account of corruption, law and order and military in politics. Corruption is an indication of corruption within the political system which can distort economic and financial environment, however, law & order indicate the strength and impartiality of legal system. The economies where the role of military is high in political system and stability situations are not good, government face difficulties to execute the fiscal policy. The results indicate that political instability is significantly related with the budget deficit. Furthermore, poor law and order condition can lead to a situation, where fiscal authorities find it difficult to adjust that may ultimately change the economic conditions ,therefore, indirectly lead to budget deficit Fataa & Mihov (2010). Additionally, Angello & Sausa (2009) suggest that higher level of political instability and less democracy is also accompanied with higher budget deficit.

Conclusion

This study is to examine the impact of macroeconomic and institutional variables on budget deficit of Pakistan. To observe the long run relationship between the institutional variables and budget deficit co-integration technique is used.

The study empirically investigates the impact of economic and institutional quality variables that can affect the budget deficit of Pakistan. The results indicate that inflation and trade openness are positively associated with budget deficit. However, real per capita output has insignificant effect. Nevertheless, when the institutional variables i.e. corruption, law and order, political stability and military in politics are included in the model, real per capita output has significant effect on budget deficit. This specifies that economic factors alone cannot determine the extent economic factors on budget deficit of an economy. Political and institutional variables are the key factors to determine the issue Alesina & Perotti (1996). The results indicate that higher corruption, poor institutional quality and law and order situation can increase the budget deficit. However, political stability can have a positive effect on budget balance. The results of the study lead to the main implication for the government that by improving the quality of institutions and focusing on law and order and economic stability can ensure the reduction in budget deficit and would certainly have positive effect on economic growth.

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