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ABSTRACT

Pakistan's economy has witnessed occasional spurts in economic growth, unfortunately, the economic growth has not been sustainable. One of the culprits often cited for haphazard growth experience of Pakistan is fiscal imprudence. In this paper we have analysed the impact of fiscal consolidation on growth. By taking annual data from 1976–2014 we checked the association of components of fiscal policy with growth. It is concluded that budget deficit has non-linear association with growth. Moreover, interest payments have negative correlation with growth therefore, it is extremely important to curtail both the interest payments as well as primary deficit. Current tax structure is not growth enhancing therefore structure of tax needs reforms in such a way that it helps the growth process as well as maintain equity. Development expenditures needs to be increased with a curtailment in current expenditures to boost growth.

JEL Classification: O47, E62, H20, H5, H62, C26

Keywords: Microfinance, Subsidy Uncertainty, Outreach, Mission Drift, Sustainability

1. INTRODUCTION

A Greek tragedy is being staged in Greece these days. One hopes it does not become as epic as some of the classical Greek tragedies became, as the protagonists are the people of Greece and not fictional characters. Nevertheless, the economy of Greece is in a quagmire, with its debt soaring and economy spiralling downwards. The blame is being squarely put on wasteful spending of the Greek government. The dissidents claim what Greece needs is fiscal stimulus. Before Greece, Ireland faced somewhat similar situation. In fact, the European Debt Crisis has affected almost every economy in Europe, barring Germany and a few others. How the crisis would resolve is still being mooted, the Greek crisis has intensified discussion on fiscal austerity and its relation to economic growth. The Greek crisis and incessant debate on fiscal reforms and their relation with economic growth in Pakistan have motivated us to explore the fiscal-growth nexus empirically.

Economic growth is usually among the first priorities of the economic managers around the world. In order to achieve more sustainable growth, the policymakers analyse different aspects of growth. Although Pakistan's economy has witnessed occasional spurts in economic growth, unfortunately, the economic growth has not been sustainable. One of the culprits often cited for haphazard growth experience of Pakistan is fiscal imprudence. It is argued that in order to achieve high economic growth, Pakistan's economy must achieve fiscal soundness, among other things, and to this end fiscal consolidation is advocated. Consequently, fiscal consolidation through increasing revenues and decreasing deficit financing was among the major policies adopted in 1990s[1] but the outcome of the policy was not impressive.

It is argued that prudent fiscal policy, which means low fiscal deficit and public debt, is crucial for sustainable economic growth. Since if the growth in debt services exceeds the growth in revenues leads to economic turmoil [Oblath (1995)] therefore, the fiscal consolidation that focuses on elimination of debt and profligacy is critical for the economic growth [Gupta, *et al*. (2005)]. The empirical research on fiscal consolidation, based on one school of thought, shows that the fiscal contraction may stimulate growth.[2]

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[1] See *Pakistan Economic Survey 2007-08*, Finance Division, Government of Pakistan.

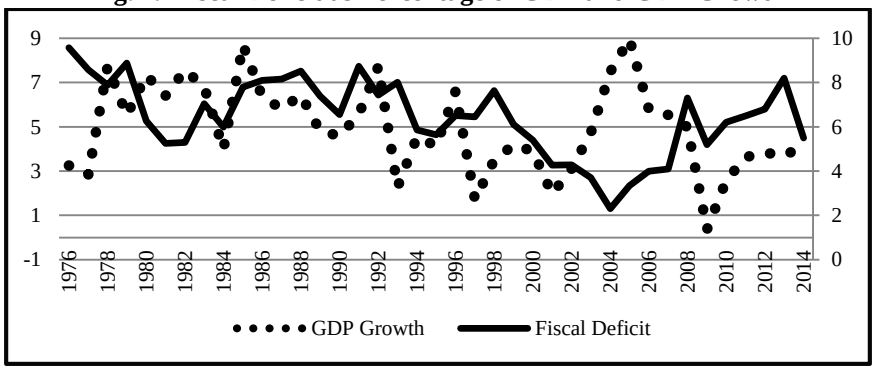
[2]See Dabrowski (1996), Mcdermott and Wescott (1996), Perotti (1998, 1999), Gupta, *et al*. (2005), and Hagen and Strauch (2001).

Episodes of consolidation that emphasise the expenditure cut, especially current expenditures, are more successful as compared to revenue side consolidation [Hagen and Strauch (2001)]. Moreover, the expansionary impacts of fiscal consolidation also depend upon its adoption as a part of broader adjustment programme [McDermott and Wescott (1996)]. The Policy of consolidation is more persistent and long-lasting if accompanied by reduction in expenditures, especially in wage bills and transfers. On the contrary, if the consolidation is based on increase in the tax revenues or cut in investment then the consolidation in most of the cases remains unsuccessful [Perotti (1998) and Afonso, *et al*. (2006)].

Currently, fiscal policy in Pakistan is attempting to encompass both expenditure- and revenue-based consolidation through prudent expenditure management and efficient resource mobilisation.[3] Government is taking austerity measures to manage fiscal profligacy but at the same time, the government needs to enhance the tax net greatly. Consequently, the fiscal deficit came down to 4.6 percent of GDP in 2013 from 7.3 percent in 2008 due to the measures taken by the Government. As a result of expenditure-based consolidation, the government expenditures stood at 13.9 percent of GDP in 2013 as compared to 21.4 percent in 2008. The austerity measures and current expenditure curtailment has made it possible to bring the current expenditures down to 11.5 percent of GDP from 17.4 percent during the 2008–2013 period. On the other hand, the tax revenues increased from 9.9 percent of GDP in 2008 to 11.1 percent in 2013. This shows that the measures taken to consolidate the fiscal aspect of the economy have started showing results. But low real growth rate, which was 5 percent in 2008 and 3.6 percent in 2013, has left a question mark over the success of fiscal consolidation, at least in short-run.

It can be seen from the Figure 1 below that budget deficit started declining only in 1997 and the process continued until 2004. However, the budget deficit again shows an increasing trend.

Fig. 1. Fiscal Deficit as Percentage of GDP and GDP Growth



[3]See *Pakistan Economic Survey 2012-13*. Finance Division, Government of Pakistan.

Although the literature supports the idea of fiscal consolidation, which promotes growth, but in Pakistan growth does not seem to be sensitive to fiscal consolidation. The contradiction between the literature and the situation in Pakistan is the motivation behind the current paper. Therefore, our primary objective in this paper is to find whether fiscal consolidation has positive impact on the economic growth in case of Pakistan. Furthermore, the paper would also explore the impact of expenditure composition on the long-run economic situation.

The rest of the paper proceeds as follow. Second section analyses the literature on the fiscal consolidation. Third section is devoted to the model use in the study, while the fourth section discusses the data and descriptive statistics have been presented in fifth section. The Econometric Technique presents in sixth section and the empirical results and findings are presented, and discussed, in section seven. The last section contains the conclusion and policy recommendations. It also highlights different dimensions that need to be explored further on the topic of fiscal consolidation.

2. LITERATURE REVIEW

Different theoretical perspectives are present in the literature regarding the impact of fiscal deficit on growth. Those who are in favour of Keynesian view suggest that an increase in the government spending would positively affect the output level in an economy. They contend that expansion in government spending, either by investment or by consumption, would have multiple impacts due to the presence of unemployed resources. Hence, during the time of economic depression, government should engage in active fiscal policy and run a deficit to stimulate the aggregate demand and vice versa.

The neoclassical perspective, on the other hand, recognises the fiscal deficit as bad for the economy. According to this view, increase in government spending leads to borrowing, which puts the pressure on interest rate. As a result of the hike in interest rate, the private investment is crowded out by the public borrowing. This challenges the potency of active fiscal policy to stabilise the economy. Besides, lower private investment has long run negative impacts on the economy. Furthermore, the effectiveness of the fiscal policy is dependent on time. The fiscal policy does not respond instantaneously and the involvement of lags makes it difficult that fiscal policy will ever be effective. The rational expectation and real business schools perspectives also assert that the fiscal deficit cause debt accumulation and interest rate increase which crowds out the private investment and ignite inflation.

There also exists another viewpoint which considers fiscal policy as neutral. This view is based on individual rationality and is commonly known as the Ricardian Equivalence Hypothesis (REH). According to REH, individuals anticipate that increase in the government expenditure through borrowing in the

current period will lead to higher taxes in future. The individuals respond to this fiscal deficit by curtailing the demand and therefore the net impact of fiscal expansion may not affect the output level. The rational expectation models also suggest similar type of response to the fiscal policy.

The modern synthesis identifies the automatic stabilisers in the economy, which act counter cyclically. During recessions, fiscal deficit is a natural phenomenon and fiscal surplus during expansion. Therefore, the economy automatically moves toward full employment equilibrium and the discretionary fiscal policy is impotent and difficult to implement. However, the government can use active fiscal policy to respond to the major depressions.

Another perspective regarding fiscal deficit considers the supply side impacts of fiscal deficits. The advocates of this perspective argue that the deficit leads to higher taxes and taxes are always distortionary and change the incentives which affect the supply. They believe that those policies have no effect on the output level, which are fully anticipated. However, unanticipated policies affect the output level through the supply side.

The debate on fiscal deficit and its real effects has been unable to attain any consensus so far on analytical as well as empirical grounds. There are as many empirical explorations of the fiscal consolidation-economic growth nexus as there are theoretical perspectives, sketched above. The debate on fiscal consolidation and its impact on economic growth started essentially with Giavazzi and Pagano (1990). They take the case of Sweden and Ireland and find the expansionary effects of fiscal consolidation. This expansionary effect emerges due to increase in the private consumption expenditure. The study describes four channels through which fiscal consolidation effects the consumption, namely tax channel, inflation channel, interest rate channel, and the substitution channel. An increase in the tax rate during fiscal consolidation is regarded as contractionary, while fall in inflation and real interest rate as expansionary. The fourth channel—the substitution channel—is based on how the consumers regard the provision of public goods, like provision of schools and hospitals.

The factors that determine the success or failure of the fiscal consolidation are explored by McDermott and Wescott (1996). The magnitude and the composition of consolidation are identified as important factors in this regard. Hagen and Strauch (2001) also argue that the most of the successful consolidation episodes feature expenditure cut, especially more cuts in the current expenditure than in investment expenditure. Similarly, Alesina (2012) also supports expenditure-reducing fiscal consolidation. Nonetheless, he warns that it should be done in conjunction with pro-growth policies. Gupta, *et al*. (2005) provide the analysis of fiscal consolidation for less-developed countries and conclude that strong budgetary positions are associated with higher economic growth and the composition of expenditures also matters in this

regard. Perotti (1999) and Afonso, *et al*. (2006) also affirm the expansionary fiscal consolidation hypothesis for central and eastern European countries.

Hjelm (2002) describes the role of monetary policy and exchange rate in the event of fiscal consolidation. The analysis suggests that fiscal consolidations preceded by the real depreciation in the exchange rate are more successful as compare to other cases. In other words, Hjelm (2007) provides the Keynesian explanation of the expansionary phenomenon of fiscal contraction. The author argues that the positive effects of the current account improvement and expenditure reallocation spread through conventional Keynesian channel.

The discussion on fiscal consolidation is further extended by Perotti (1998), who brings in the picture the institutional setup along with its macroeconomic effects and implementation. In a similar vein, Angelopoulos and Philippopoulos (2007) introduce the quality of infrastructure into the debate of fiscal policy. The duration and determinants of fiscal consolidation is explored by Illera and Granados (2008) by taking the case of 15 European economies for the 1960-2004 period. Both the parametric and non-parametric analyses yield that the longevity of fiscal consolidation depend on the level of debt, the quality of consolidation,[4] and the political fragmentation in the economy. Although the economic variables are found to be robust in determining the duration of fiscal consolidation, the non-economic variables lose significance in different specifications.

Hogan (2004) criticises the expansionary fiscal consolidation on the basis of econometric analyses used in previous studies. The author first points out the econometric drawbacks of the studies that have used panel data and then conclude that the expansion in the private consumption is not enough to offset the contractionary impact of public consumption in an economy.

de Cos and Moral-Benito (2013) support the Keynesian view for OECD countries, which states that fiscal consolidation negatively effects the growth. Similarly, Cournède, *et al*. (2013) argue that fiscal consolidation may require increase in harmful taxes and cut down in valuable expenditures. Therefore, it can create difficulties for the government to achieve other policy goals. They stress the need for structural reforms along with fiscal consolidation in order to achieve short term as well as long term goals.

Nauschnigg (2010) writes in favour of growth-friendly fiscal consolidation. It states that if government reduces its fiscal deficit, or increases its fiscal surplus, then private sector and/or external sectors need to reduce its surplus or increase its deficits. If this is not followed accordingly then economy will move into a recession, which may further accumulate the public debt since lessons from the 1930. Depression tell us to use expansionary fiscal and monetary policies in order to boost the economy.

[4]This measures the share of primary expenditures in total deficit.

Pennings and Ruiz (2013) check the speed of fiscal consolidation and its impact on growth. The study finds that fast episodes of consolidation have higher multipliers thus supporting consolidation at a steady pace. It suggests that consolidation at a steady pace would reduce the adverse effects of fiscal consolidation.

According to Huixin, Leeper, and Leith (2013), expansionary fiscal consolidation is conceivable in a very particular set of conditions. They argue that people form expectation for fiscal consolidation as debt level rise, which implies that people have fair and clear expectations and there is no ambiguity in their expectation formation. Consumers and producers both anticipate higher taxes as debt level rise and fiscal consolidation starts. But they are surprised by the consolidation done through spending cuts instead of increasing taxes. This condition is based on the reputation of the government and when monetary policy is consistent with fiscal consolidation, i.e., when the central bank relaxes monetary policy.

A new model for the international policy coordination, especially for the case of fiscal consolidation is built by Caporale, *et al*. (2005). They used both the optimal simple rule and the game theoretic analysis in order to check the externalities of fiscal consolidation policy. The study concludes that if the policy of fiscal consolidation is coordinated with monetary policy then the policy spillovers in terms of externalities and welfare improvement are substantial. Akram, *et al*. (2011) comprehensively evaluate the fiscal position in Pakistan by analysing all the expenditure heads, along with their impact on economic growth and poverty. The Pakistani economy is found resilient against the economic rescissions but unable to tackle the deficit problem efficiently mainly due to the revenue side problems. Fatima, *et al*. (2011) explores the link between the fiscal deficit and investment expenditure keeping in view the importance of investment in the economic growth of a country. The analysis of data, which ranges from 1980–2009, shows that the deficit problem is primarily due to gloomy situation of revenue efforts.

The above discussion led us to a conclusion that few studies are against the fiscal consolidation because it hampers the growth. Few other studies favours fiscal consolidation by arguing that it depends upon what kind of consolidation is ensuing by the government. It is generally argued that consolidation that focuses on expenditure cut is more successful and promising towards growth than consolidation that focuses on revenue increase. Nevertheless, overall effect of fiscal consolidation or fiscal expansion on growth is ambiguous.

3. MODEL

The impact of fiscal consolidation on economic growth has been studied in various studies [such as, de Cos and Moral-Benito (2013), Nauschnigg

(2010), Pennings and Ruiz (2013), Easterly and Rebelo (1993) etc.] by applying different models, methodologies and battery of tests. In this paper we follow the model used by Gupta, *et al*. (2005) by regressing growth of per capita GDP on fiscal variables, along with a set of non-fiscal control variables. Therefore, based on Gupta, *et al*. (ibid.), our model is,

Economic Growth = f (*L, K, HK, TO, Components of Budget Deficit*)

Labour force, physical capital, human capital and trade openness are the variables suggested by the economic growth theory to explain economic growth, as suggested by Mankiw, Romer, and Weil (1992), Barro (2003), among others.

The components of budget deficit include revenues and expenditures. However, we have also bifurcated revenues into tax revenues and non-tax revenues. In addition, tax revenues are further subdivided into direct and indirect taxes. Expenditures are also subdivided into current and capital expenditures. These bifurcations are done to separate the impact of fiscal variables from effect of traditional variables on economic growth. Moreover, as suggested by Gupta, *et al.* (op. cit.), the ambiguous association of fiscal variables and economic growth could be due to non-linear association among the variables. Therefore, we have also used squared terms of both the budget deficit as well of composition of taxes and expenditures.

4. DATA

The time-period used in the paper for the analysis is from 1976 to 2014. Data on both the fiscal and the non-fiscal variables are taken from the *Handbook Statistics of Pakistan 2010* and various issues of *Pakistan Economic Survey*. One of the major issues we faced regarding data is non-availability of certain variables on one base period. The variables are thus converted into one base using the growth projections method.[5]

Real GDP growth and real per capita growth are used as a proxy for economic growth. Employed labour force (L) is measured in millions and gross fixed capital formation (GFCF) is taken in millions at constant prices. The capital stock series (K) is estimated using data on Gross Fixed Capital Formation in constant prices and capital stock depreciation rate.[6] The data on depreciation rate is obtained from Penn World Tables (PWT 8.0).[7] Variable of trade openness is measured by adding exports and imports in million rupees and divided it by GNP at current market prices taken in million rupees. The primary

[5]Using growth rates of each variable in different years irrespective of their base years to obtain series on one base.

[6]Some authors assume constant depreciation rate but we have used, following Berlemann and Weselhöft (ibid.), time-varying depreciation rate.

[7]The entire methodology is given in Appendix A and data of capital stock is given in Appendix B.

school enrolment and secondary school enrolment rates are taken as a proxy for human capital (HK). Time series of primary enrolment and secondary enrolment rates are obtained by dividing primary enrolment and secondary enrolment in thousands by population in the relevant age groups, i.e. 5-9 and 10-14 age groups respectively. The source of the enrolment rates data (in thousands) is *Economic Survey*, whereas population in the age groups 5-9 and 10-14 is taken from *UN statistics*.

The fiscal variables, such as total revenues, total tax revenues, direct tax revenues, indirect tax revenues, total expenditures, current expenditures, capital expenditures, external and domestic financing of budget deficit, interest payments and overall fiscal deficit are divided by GDP at market prices to transform each variable in percentage of GDP term. Primary deficit is calculated by subtracting overall fiscal deficit from the interest payments.

5. DESCRIPTIVE STATISTICS

There are numerous reasons cited for high budget deficit, among which, lower tax revenues take the top spot. However, it has been seen that reduction in revenue collection, in general, leads to reduction in expenditures, especially the development expenditures. Another important reason is the unforeseen circumstances such as floods, earthquakes etc., which leads to higher deficit despite cut down in capital expenditures. In budget 2014-15, the maximum budget (38 percent of total budget)[8] was allocated to debt servicing,[9] which is among the major causes of high deficit budget.

Table 2 shows that the average budget deficit since 1976 has been 6.37 percent of GDP. Among several episodes of higher and lower budget deficits, the maximum budget deficit was in 1976 (Figure 1, Appendix C). On average, deficit was 4.88 percent during 1976–1980. In the first 25 years of the time period used for analysis in this paper (1976–2000), the average budget deficit was more than seven percent, while in the last one and a half decade it has remained close to 5 percent, despite it being as high as 8.2 percent of GDP in 2013. On the other hand, average primary deficit has been 2.2 percent since 1976. Few episodes of primary surplus are also apparent in Figure 2 (Appendix C), especially during 1997–2004, which shows significant impact of the interest payments on the budget deficit.

Although correlation of GDP growth with budget deficit is low but it is positive (5.05 percent) (see Table 1), which shows that higher budget deficit is positively associated with growth. Nevertheless, it is not statistically significant. However, it is negatively correlated (–34.7 percent) with the GDP per capita

[8]The calculation is done by taking values from Federal Budget 2014-15: Annual Budget Statement.

[9]Revised estimates of 2013-14 show that share of debt servicing was 47 percent of total budget (See Federal Budget 2014-15: Annual Budget Statement).

growth. More importantly, correlation between GDP growth and primary deficit is negative (–31 percent), while correlation between primary deficit and GDP per capita growth is also negative (–56 percent). Moreover, both the GDP as well as GDP per capita growth are negatively correlated with interest payments, i.e., –41 percent and –45 percent respectively. This implies that fiscal consolidation along with reduction in interest payments may lead to higher economic growth.

Table 1

Correlations

	GDP Growth	GDP Per Capita Growth
Budget Deficit (% of GDP)	5.05	–34.76
Primary Deficit (% of GDP)	–30.85	–55.70*
Interest Payments (% of GDP)	–41.21**	–45.12**

Note: * and ** indicate significant at one and five percent level of significance.

Table 2

Trends in Fiscal Variables and GDP Growth

Period	Budget Balance	Primary Balance	Tax Revenue	Non Tax Revenue	Direct Taxes	Indirect Taxes
1976-2014	–6.43	–2.24	10.95	3.95	2.73	8.22
1976-2000	–7.16	–3.02	11.74	4.17	2.44	9.30
2001-2014	–5.12	–0.95	10.89	4.09	3.63	7.25
1976-1980	–4.88	–0.74	10.97	4.13	3.66	7.31
1976-1990	–7.42	–4.71	12.06	4.28	2.00	10.06
1981-1990	–7.01	–3.66	11.98	4.94	2.08	9.90
1991-2000	–6.78	–0.49	11.24	4.00	3.09	8.15
2001-2010	–4.47	–0.38	11.30	4.54	3.71	7.59
2011-2014	–6.75	–2.38	9.85	2.95	3.45	6.41

Period	Current Spending	Capital Spending	Interest Payments	GDP Growth	Per Capita GDP Growth
1976-2014	16.75	5.71	4.49	5.04	2.61
1976-2000	17.46	6.71	4.47	5.29	2.80
2001-2014	15.30	3.53	4.53	4.34	2.15
1976-1980	15.23	3.54	4.54	4.39	2.16
1976-1990	16.49	8.09	3.19	5.87	3.08
1981-1990	17.58	7.30	3.80	6.14	3.10
1991-2000	18.92	4.63	6.39	4.41	2.38
2001-2010	15.08	3.51	4.60	4.55	2.20
2011-2014	15.87	3.59	4.37	3.82	2.03

Figure 3 (Appendix C) also gives interesting insights from the data. We have estimated trend curves using polynomial equation up to degree 6. This gives us the non-linear movement of each variable. Cyclical movement in both the variables, namely GDPG and PGDPG, shows that as budget deficit declines GDP growth increases and vice versa. This result alludes to the importance of fiscal consolidation to boost growth. However, this does not imply statistical significance, which is discussed in Section 7.

A sudden decline is also observed in the tax revenues during the 1996-2000 periods, from the high of about 13 percent in 1980. Thereafter, tax revenues have remained relatively flat at around 9-10 percent (see Figure 4, Appendix C). Figure 5 (Appendix C) shows that a major portion of the revenues comes from tax revenues. The share of non-tax revenues, in total revenues, was less than 20 percent in 1970s, which has now slightly increased to more than 20 percent. The decline in total tax revenues is associated with decline in indirect taxes, while direct taxes have remained almost the same (Figure 5, Appendix C). The share of direct taxes in total tax revenues has increased from 15 percent in 1990 to 35 percent in 1998 but no further increase is evident after 1998 as shown in the Figure 9.

On the expenditure side, capital spending has been declining since 1976 from more than 10 percent of GDP to close to 2 percent in 2013 and 2014. On the other hand, although current spending has declined over the years, it is still close to 12 percent of GDP. Interestingly, the share of capital spending in total expenditures, which was more than 40 percent during the late 1970s, has been reducing continuously and now it is less than 20 percent.

It may be concluded from the above discussion that continuous decline in the capital spending, as well as in total tax revenues, along with increase in budget deficit could be one of the reasons for low GDP growth. Nevertheless, fiscal consolidation, coupled with decline in interest payments, may lead to higher economic growth.

6. ESTIMATION TECHNIQUE

Theoretically, labour, physical capital and human capital affect growth through production of goods and services and growth, in turn, affects demand for labour, capital and human capital. Similarly, there are several other variables in our model that may be affected by various other variables not present in the model. Therefore, we may face serious problems of endogeneity. Moreover, we need more than one instrument to solve the problem of endogeneity.

Since potentially, every explanatory variable in the model is dependent on several variables, whether present in the model or not present in the model. Thus, a linear combination of lagged (exogenous) variables will be used as instruments for each explanatory variable. This process of using multiple instruments to get instrumental variable estimator is known as two-stage least

square (2SLS) estimator. In other words, in order to circumvent the endogeneity problem that arises in growth estimations, the estimation technique used in this study is 2SLS.

2SLS is relatively easier to apply in time series data than in cross section or panel data. In time series, in general, we do not need to find different instruments, for each endogenous variable [Woolridge (2009)]. Instead, lags of the explanatory variables do the satisfactory task. Nevertheless, the number of instruments should be greater than the number of parameters estimated in the equation.

The validity of instruments is determined by the J-statistics. The null hypothesis assumes that all the instruments are exogenous. If few instruments are exogenous and few are endogenous then the J-statistics will be large. If null hypothesis is rejected then we need to look for other exogenous instruments until our null hypothesis will be accepted.

7. RESULTS AND FINDINGS

All variables are taken in natural log form. 2SLS estimation technique, as discussed in the preceding section, is used to estimate the parameters of the equation to avoid the problem of endogeneity. Lagged values of the different variables used in the model are taken as instruments. In general 3 lagged values of each variable are used for each regression, however, to check the 5 year lagged impact of primary schooling and 8 to 10 years lagged impact of secondary schooling is used as instruments in the estimation. Inclusion and exclusion of 5 years lag of primary schooling and 8 and 10 years lag of secondary schooling does not change the coefficients drastically, the statistical significance remains the same, signs remain the same and slight and negligible change has been observed in the magnitude of coefficients. Results of OLS estimation are given in the Table 3 as well which shows similar behaviour of each variable apart from slight change in the magnitude.

The condition on the validity of instruments is that the number of instruments is at least as many, or greater, than the parameters estimated in the equation. In our case, instruments are greater than the estimated parameters, i.e. $j \geq k$, where j is the number of instruments and k is the number of estimated parameters. Value of J-statistics in the results shows that instruments used in all the four regressions are statistically within a given bound, i.e. in each case, we accept our null hypothesis that all the instruments are valid.

Natural log of real GDP is the dependent variable and regressed on the linear and non-linear terms of budget deficit and its components. Signs of all the variables included in the regressions are according to the theory such as labour is positively associated with the dependent variables, capital is positively associated with the dependent variables, trade openness is positively related to the dependent variable and human capital is positively associated with the dependent variable.

The Equation 1 is the basic equation estimated in which budget deficit and its squared terms are used as independent variables, along with other control variables. Coefficient of budget deficit and budget deficit squared show that association between GDP and budget deficit is non-linear. This implies that fiscal consolidation may boost growth. Nevertheless, we are unable to calculate meaningful threshold level of budget deficit. Moreover, it also tells us that if we keep the similar policies of higher current expenditures and declining in capital expenditures then deficit financing will not favour the growth process.

Fiscal consolidation, in general, is a phenomenon of cutting down expenditures. However, fiscal consolidation may also be achieved by raising revenues as raising the revenues leads to reduction in budget deficit, if expenditures remain the same. To see the impact of revenues and expenditures on economic growth separately, in Equation 2 (see Table 3), we have used total revenues and total expenditures instead of budget deficit. The results are significant and in line with the results of Equation 1, which implies that increase in revenues and decrease in expenditures enhances GDP growth.

In Equation 3 and Equation 4, we have used the components of tax revenues and total expenditures, i.e., direct taxes, indirect taxes, capital spending, and current spending. Capital spending and current spending in Equation 3 shows opposite signs which is according to the theory that increase in current expenditures are not good for growth but increase in capital/development expenditures boost long run growth. Although the signs are correct but both variables are insignificant. The insignificant association of capital spending could be due to lower share of capital spending in total expenditures as well as the nature of capital spending on those projects where the productivity is lower. Capital spending, especially, on social sector such as education and health sector boosts long run growth, which was not scope of this study and may be checked in the other study.

Direct taxes and indirect taxes show insignificant association with GDP growth (Equation 4). This implies that increase in revenues may not enhance growth. This gives another indication that our tax structure is not growth enhancing and we need structural changes in the tax structure, i.e. reforms are the key. Although taxation distorts production and create inefficiencies in the economic system and it is in general used to boost equity give government space for expenditures where market fails. Albeit, reforms are needed to increase the base instead of increasing the existing tax rates and increasing the tax burden on existing tax payers. Contrary to Equation 3, this equation shows positive and significant association of capital spending with growth. This may imply two scenarios which can be checked in the future research, i.e., (i) increase in revenues may not effect growth directly but through increase in capital spending, and (ii) capital spending may not have non-linear effect on growth, which has lesser possibility.

It is important to mention that we have used several dummies to capture the impact of primary deficit, taxation reforms, expenditure changes, regime changes etc. All the dummy variables are insignificant and did not change the magnitude, signs and significance of other variables. Therefore we did not include those dummy variables in our model.

Table 3

Results of the Estimation

	Equation 1		Equation 2		Equation 3		Equation 4	
Variable	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
Constant	–10.83*	–11.71*	–6.22**	–16.69*	–5.31***	–9.30*	–6.76**	–9.99*
Labour	0.08	0.03	0.06	–0.03	–0.15	–0.15	–0.12	–0.05
Capital	1.46*	1.60*	1.00*	1.94*	1.06*	1.50*	1.12*	1.45*
Primary School Enrolment	–0.01	–0.02	0.04	0.02	0.13*	0.09	0.15*	0.05
Secondary School Enrolment	0.21*	0.16*	0.11	0.16*	0.02	0.03	0.05	0.07
Trade Openness	0.08**	0.13*	0.09**	0.16*	0.09***	0.14**	0.03	0.06
Budget Deficit	0.56*	0.44*						
(Budget Deficit)^2	–0.02*	–0.02*						
Total Revenues			–0.82***	–1.25***	–0.60	–0.56		
(Total Revenues)^2			0.03**	0.04	0.03	0.02		
Direct Taxes							0.13	0.12
(Direct Taxes)^2							–0.01	–0.004
Indirect Taxes							0.36	0.33
(Indirect Taxes)^2							–0.01	–0.01
Total Expenditures			1.51*	1.73*				
(Total Expenditures)^2			–0.06*	–0.06*				
Capital Spending					0.08	–0.28	0.07*	0.06**
(Capital Spending)^2					–0.002	0.01		
Current Spending					1.05*	1.09	0.09**	–0.03
(Current Spending)^2					–0.04*	–0.04		
R^2	09992	0.9991	0.9993	0.9993	0.9995	0.9992	0.9992	0.9990
$\overline{R}^2$	09990	0.9989	0.9991	0.9991	0.9992	0.9988	0.9989	0.9984
F-statistic	5453	3818	4585	3517	4575	2055	3117	1578
J-Statistic		19.95		18.55		17.00		17.00
Prob.		0.398		0.355		0.454		0.454

Note: *, **, *** indicate significant at one, 5 and 10 percent level of significance.

8. CONCLUSIONS

The study has made an attempt to explore the association between fiscal variables and growth. Literature suggests sparse association between the two variables. Following the discussion and functional form used by [Gupta, *et al*. (2005)] the study examines the association between fiscal variables and growth. Moreover, the study has also checked the nonlinear association between the fiscal variables and growth.

The debate on fiscal policy and its impact on economy is not new. After the stagflation of 1970s emerged the Washington Consensus, which advocated,

among other things, fiscal austerity for the developing countries. Since then many developing countries have been austere in their fiscal spending but the results have been mixed. More recently, the Global Financial Crisis and the resultant "Great Depression" have once again stoked debate on fiscal policy and its impact on the economy. The opinion is yet again divided whether the desperate times are calling for fiscal impetus or fiscal restraint.

Our results suggest that there exists nonlinear association between fiscal deficit and growth and that fiscal consolidation leads to higher growth. The share of capital expenditure has been declining despite higher budget deficit, which may be one of the reasons why fiscal deficit is negatively associated with growth. Moreover, apart from declining share of capital expenditures, the negative association with growth compels us to conclude that capital expenditures incurred in the past were not very productive.

One of the important conclusions drawn from the study is the correlation between growth and interest payments which is negative. Negative correlation is also found between primary deficit and growth, which strengthen our results that we need to reduce our primary deficit to boost growth. Nevertheless, primary deficit combine with higher interest payment will be double blow to the economy, therefore it is extremely important to curtail both the interest payments as well as primary deficit.

One of the important implications of the present study is that our tax structure is not beneficial for growth process. Although indirect taxes show positive association with growth but both the taxes are not significantly effecting growth. Thus, we may conclude that increase in tax revenues will not enhance growth. It is very much possible that growth effects tax revenues and not the other way around. We may not exclude the fact that tax revenues increase fiscal space which may affect growth indirectly through increase in capital expenditures.

Similar to [Abdon, et al. (2014)] it may be argued that spending on education may enhance long-term growth. However, to spend on social sectors government needs fiscal space. To increase the fiscal space we need more revenues, which has not been helpful during the last many decades despite several ineffective tax efforts. The other way is reduction in expenditures by cutting down our interest payments, curtailment of the inefficient use of expenditures and reduction in leakages, which eat into resources and are highly unproductive.

The results show that there is a possible beneficial impact of fiscal consolidation on economic growth in Pakistan. At the same time, the results are also indicative of the fact that some fiscal deficit is necessary for giving impetus to growth in an economy like Pakistan, which is operating well below its capacity utilisation potential. Very high levels of expenditures, especially current expenditures have negative impact on growth while capital expenditures have positive impact on long run growth. Development expenditures done by the

government has externality effect as well as it has higher multiplier effect if development spending are higher but not at the cost of crowding out of private investment.

Appendices

APPENDIX A

CAPITAL STOCK[10]

The capital stock series is estimated using data on Gross Fixed Capital Formation (GFCF) in constant prices and capital stock depreciation rate.[11] The data on depreciation rate is obtained from Penn World Tables (PWT 8.0). One of the most widely used methods to estimate capital stock is Perpetual Inventory Method (PIM). The idea behind PIM is that this method treats capital stock as an inventory, which increases with investment. The investment stays in the economy once it has entered the system, though it depreciates over time at some rate, δ, but never reaches zero [Berlemann and Weselhöft (2014); p. 4]. The name Perpetual Inventory Method is derived from this so-called "perpetuality" of investment.

The net capital stock at the beginning of period t can be written as a function of net capital stock at the beginning of period t–1, K_{t-1}, investment in the previous period I_{t-1}, and consumption of fixed capital stock, D_{t-1}. Hence, we have:

$$K_t = K_{t-1} + I_{t-1} + D_{t-1}$$

Assuming that capital stock depreciates at the rate δ, we can write capital stock as:

$$K_t = (1-\delta)K_{t-1} + I_{t-1}$$

Iteration of this equation backward up to the initial period leads to the following equation:

$$K_t = \sum_{i=0}^{\infty}(1-\delta)^i I_{t-(i+1)} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

The PIM requires an estimate of initial capital stock in order to arrive at a series of capital stock for subsequent years. One way is to guess the initial value and then estimate capital stock for later years, using data on GFCF. However, it is highly arbitrary. Another method reported in the literature to obtain the initial capital stock is to use the following equation:

$$K_{t-1} \approx \frac{I_t}{g_I+\delta} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

[10]The discussion in this sub-section is based on Berlemann and Weselhöft (2014).

[11]Some authors assume constant depreciation rate but we have used, following Berlemann and Weselhöft (ibid.), time-varying depreciation rate.

where $K_{t-1}$is initial capital stock, in period $t-1$, I_t is GFCF in period t, g_I is growth rate of GFCF for the entire period for which the capital stock period is to be estimated, and δ is capital stock depreciation rate. The rationale behind using the above equation to estimate initial capital stock is that capital stock and investment grow at roughly the same rate and growth rate of investment can be used to approximate initial capital stock. Following Berlemann and Weselhöft (ibid.), we regress GFCF on time to derive initial investment for the period t, using data from t_2 to T. Specifically, the following equation is used to estimate initial investment, using OLS method:

$$lnGFCF_t = \alpha + \beta \cdot Time + \varepsilon_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

Next, using the estimated parameters, α and β from Equation 3, we calculate fitted value of investment for period t:

$$ln\widehat{GFCF}_{t1}\alpha + \beta \cdot Time_1 \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

This gives us a series of investment, ranging from t to T, using exponential function. We use the first value of fitted investment for t to calculate initial capital stock, using Equation 2. Instead of calculating growth rate of investment, g_I, calculated from the data, we use β as a measure of trend investment growth. Capital stock for subsequent years is then calculated using Equation 1 above.

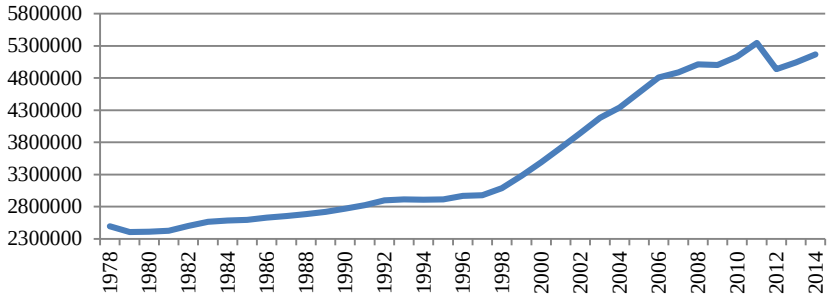
APPENDIX B

Capital Stock Series

Year	Capital Stock	Year	Capital Stock	Year	Capital Stock
1976	754,269.90	1989	1,113,225.70	2002	1,520,168.80
1977	806,431.32	1990	1,140,935.71	2003	1,562,012.24
1978	831,408.60	1991	1,169,173.19	2004	1,605,430.94
1979	855,446.92	1992	1,198,153.08	2005	1,651,209.17
1980	879,575.80	1993	1,227,289.10	2006	1,699,296.51
1981	903,834.07	1994	1,256,399.82	2007	1,748,193.32
1982	928,844.93	1995	1,285,533.45	2008	1,798,350.14
1983	954,477.54	1996	1,315,205.55	2009	1,848,370.94
1984	980,328.12	1997	1,344,993.70	2010	1,899,708.35
1985	1,006,302.33	1998	1,375,882.58	2011	1,953,200.72
1986	1,032,592.79	1999	1,408,693.55	2012	2,002,609.10
1987	1,059,164.00	2000	1,443,606.91	2013	2,053,028.74
1988	1,086,022.67	2001	1,480,742.16	2014	2,104,727.98

Graph

Change in Capital Stock



APPENDIX C

Fig. 1. Budget Balance

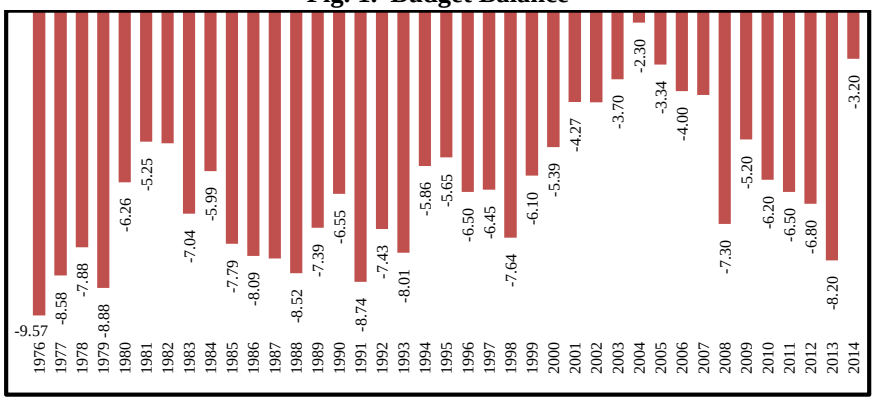


Fig. 2. Budget Deficit and Primary Deficit

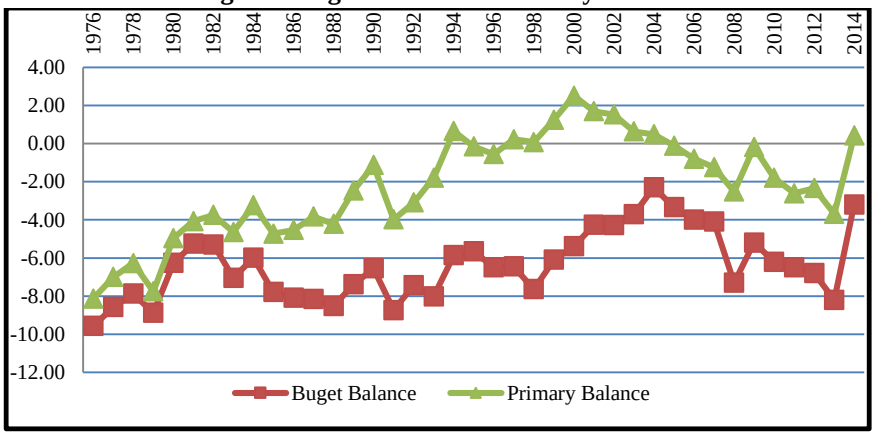


Fig. 3. Share of Tax and Non-Tax Revenues

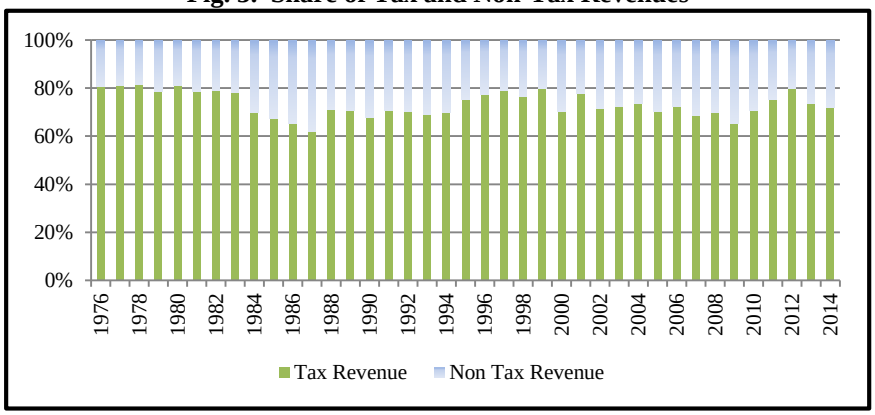


Fig. 4. Share of Current and Capital Spending

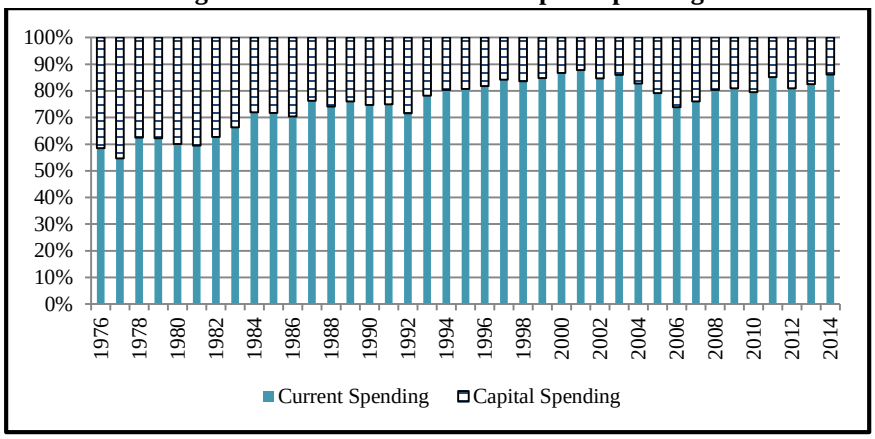
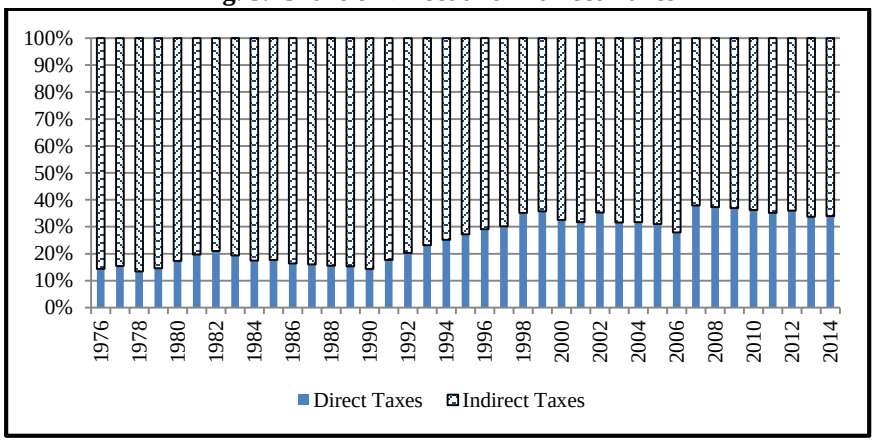


Fig. 5. Share of Direct and Indirect Taxes



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