IS FISCAL POLICY EFFECTIVE IN GENERATING HIGHER REAL OUTPUT? A CASE OF PAKISTAN

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ABSTRACT

Keeping in view the objective that is to observe the usefulness of fiscal policy on real GDP of Pakistan, the study collects time series data from 1976 to 2012 through reliable sources of statistical bureaus of Pakistan. Using Johansen Cointegration test, the long run results demonstrate investment and government expenditure as raising factor for real GDP of Pakistan while GDP Deflator and government revenue as de-motivating factor for real GDP of Pakistan in the long run.

I. INTRODUCTION

Fiscal policy means planning of expenditure and tax rate by the government to stimulate the economic activities. Macroeconomics, particularly the Keynesian school of thought, suggested that government spending speed up economic growth. Thus, government expenditure is considered as an exogenous power that changes cumulative output.

There are two conceptually opposite views about the role of government. First, government spending is expected to be unfavorable to economic growth due to inefficient methods of allocating resources, favoring excess employment and under pricing of output to maintain the power. In addition, public spending started by greatly subsidized state-owned monopolies that reduce potential for private investment and long-run economic growth. Another reason is that financing of public expenditures through external and internal indebtedness imposes too much burdens on the economic system resulting in undesirable effects on economic growth.

Second, Government plays a serious role in matching disagreement between the social and private benefit and in providing a socially best way for development. Government can make product markets that work more competently and create significant spillover effects for private sector. Few studies state that fiscal policy has a positive relationship with the real GDP by creating employment and generating higher income of the people leading to an increase in the aggregate demand. The increased aggregate demand will give an incentive to the producers to increase their output.

Ghali (2003) investigated Government spending as having accelerating effect on economic growth in Tunisia. The policy effects according to the endogenous growth theory are opposite to that of neoclassical theory which argues that changes in tax rate may have an impact on growth [Romer (1986, 1990); Lucas (1988); Rebelo (1991); Jones (1993); Aghion and Howitt (1992); Kim (1992) and Gomme (1993)].

Taking into mind, the objective of this study is to present the influence of fiscal policy on real GDP of Pakistan using time series data from 1976 to 2012. This study is further divided into Literature Review, Data and Methodology, Results and Discussions, Concluding Remarks and Suitable Policy in sections 2, 3, 4, and 5.

II. LITERATURE REVIEW

This section provides summary of few studies related to fiscal policy and economic growth as below;

Ghali (1997) observed Intertemporal exchanges between the growth rate of per capita real GDP and the share of government expenditure in GDP using vector auto regressive method for the results. The study found no evidence in Saudi Arabia regarding influence of government spending on per capita output growth.

Doessel and Valadkhani (2003) examined relationship between size of government and the process of economic growth in Fiji using annual time series data for the period 1964-1999. The study concluded that government expenditure exerted a strong beneficial impact on economic growth. Loizides and Vamvoukas (2005) explored the relationship between government size growth and income growth in both bi-variate and tri-variate system. Using time series data of Greece, UK and Ireland, the analysis showed government size granger causing economic growth in the long run as well as in the short run.

Alexiou (2009) discovered the relationship between economic growth and government spending for seven countries in the South Eastern Europe region for the period 1995 to 2005. The empirical evidence indicated that Government Spending on capital formation, development assistance, private investment and trade openness had positive and significant effect on economic growth. Padda and Akram (2009) focused on tax rate changes adopted by South Asian countries having an impact on economic growth and probed changes in tax rate as negative for short term on economic growth.

Nurudeen and Usman (2010) attempted to investigate the effect of government expenditure on economic growth. The study revealed that government total capital expenditure, total recurrent expenditures, and government expenditure on education had negative effect on economic growth. On the contrary, rising government expenditure on transport and communication, and health resulted an increase in economic growth.

Asghar et al. (2011) intended to observe empirically the effect of government spending in social sectors on economic growth for the period 1974 – 2008 in Pakistan and revealed the existence of positive relationship between government expenditure on human capital and economic and community services and economic growth. On the other side, government expenditure on law and order and subsidies appeared to be negative for economic growth.

Al Bataineh (2012) concluded government expenditure at the aggregate level as positive impact on GDP growth using time series data for the period 1990 – 2010 for Jordan. Nworji et al. (2012) studied the impact of public expenditure on economic growth in Nigeria based on time series data for the period 1970 – 2009 using ordinary least square method. Analysis illustrated that capital and recurrent expenditure on social and community services and recurrent expenditure on transfers had positive effect on economic growth.

Ferede and Dahlby (2012) examined Canadian provincial governments' tax rates on economic growth using panel data over the period from 1977 – 2006 and concluded corporate tax rate and sales tax rate as negatively associated with growth rate of GDP per capita. Atif et al. (2012) empirically tested taxes, inflation and bank loans and investment on economic growth using ordinary least square method in Pakistan and indicated no effect of taxes on economic growth by utilizing annual data set from 1981 to 2010.

Aladejare (2013) indicated dynamic interactions between government capital and recurrent expenditure and economic growth in Nigeria. The study discovered positive impact of Government capital, recurrent expenditure on economic growth.

III. DATA AND METHODOLOGY

Data, methodology and model specification are highlighted in this section.

A. DATA AND METHODS

Time series annual data is collected in this study over the period from 1976 to 2012. Data on all the variables are collected through Handbook Statistics on Pakistan Economy 2010 and Economic Survey of Pakistan (2012 – 13) which are reliable sources for economy of Pakistan. For calculation of elasticities, log – log form of the models are utilized. Results are estimated using Johansen Cointegration approach involving following steps;

1. Applying Unit root test (ADF) to know stationary of the variables for deciding about an appropriate estimation technique. If all variables are integrated of order 1, so Johansen Cointegration technique is considered as best one.
2. At second step, choosing an appropriate lag length of the models is necessary to be confirmed.
3. After finalizing an appropriate lag length, long run results are calculated using Johansen Cointegration test.
4. For short run estimates, vector error correction model is applied.

B. MODEL DESCRIPTION

Keeping in view the importance of fiscal policy, the study includes government expenditure and government revenue in the models specified below;

$$RGDP = \alpha_0 + \alpha_1 ELF + \alpha_2 INV + \alpha_3 GDPDEF + \alpha_4 GEXP + u_i$$

$$RGDP = \beta_0 + \beta_1 ELF + \beta_2 INV + \beta_3 GDPDEF + \beta_4 GREV + v_i$$

In the above models, RGDP is real gross domestic product, ELF denotes employed labor force, INV indicates investment, GDPDEF shows GDP Deflator, GEXP represents government expenditure and GREV signifies government revenue. The inclusion of Employed Labor force and investment shows Solow growth model used in the current study. All variables are in natural log form. Hypotheses of the study are provided in table 1.

Table 1: Hypothesis

Variables	Description	Unit of Measurement	Expected Relationship
RGDP	Real Gross domestic product	Million rupees	Dependent Variable
ELF	Employed Labor Force	Million	Positive
INV	Investment	Million Rupees	Positive
GDPDEF	GDP Deflator	Price Index	Negative
GEXP	Government Expenditure	Million Rupees	Positive
GREV	Government Revenue	Million Rupees	Negative
α_0 and β_0 are elasticities of real GDP with respect to various variables.			
u_i and v_i are error terms			

IV. RESULT AND DISCUSSION

The results of this study are discussed in this section comprising of unit root test, lag length selection, Johansen Cointegration test and vector error correction model.

A. UNIT ROOT RESULT

For estimation of econometric results, first step is required to identify stationary level of all the variables. For that purpose, Augmented Dickey Fuller test is utilized that provide confirmation about all the variables having order of integration as 1. In other words, we can say that Real GDP, Investment, Employed Labor Force, Government Revenue, Government Expenditure and GDP Deflator are stationary at first difference. Table 2 reports the results of ADF test.

Table 2: ADF Unit Root Test

Variables	Tests for Unit Root in	Include in Test Equation	Test Statistics		Results
			ADF test statistics	ADF Critical Value 0.05	
Real GDP	Level	Intercept	-1.24599	-2.945842	I(1)
		Trend and Intercept	-2.43842	-3.540328	
	1st Difference	Intercept	-6.10357	-2.948404	
Investment	Level	Intercept	0.58275	-2.94585	I(1)
		Trend and Intercept	-2.82086	-3.54033	
	1st Difference	Intercept	-5.29938	-2.948405	
Government Revenue	Level	Intercept	-1.66134	-2.94585	I(1)
		Trend and Intercept	-2.22942	-3.54033	
	1st Difference	Intercept	-4.07176	-2948404	
Government Expenditure	Level	Intercept	-0.75389	-2.94585	I(1)
		Trend and Intercept	-2.06149	-3.540328	
	1st Difference	Intercept	-3.84358	-2.948404	
GDP Deflator	Level	Intercept	-0.52976	-2.945842	I(1)
		Trend and Intercept	-1.79233	-3.540328	
	1st Difference	Intercept	-5.67168	-2.948404	
Employed Labor Force	Level	Intercept	-0.36877	-2.945842	I(1)
		Trend and Intercept	-1.94905	-3.540328	
	1st Difference	Intercept	-6.37347	-2.948404	

B. LAG LENGTH SELECTION PROCESS

The second step of Johansen Co-integration technique necessitates selection of appropriate lag length using proper information criterions. In table 3, Lag Length Selection results are reported that verifies '1' as suitable lag length at which values of Akaike Information Criterion (AIC), Schwarz Information Criterion (SC) and Hannan – Quinn information Criterion (HQ) are minimum.

Table 3: Lag length Selection

Models	Lag	AIC	SC	HQ
I	0	-2.334430	-2.112237	-2.257729
	1	-12.27446*	-10.94130*	-11.81425*
	2	-12.10449	-9.660376	-11.26078
II	0	-2.698130	-2.475938	-2.621429
	1	-12.53924*	-11.20609*	-12.07904*
	2	-12.02675	-9.582631	-11.18304

* indicates lag order selected by the criterion calculated using EViews-7

C. JOHANSEN COINTEGRATION TEST

To notice long run relationship among variables considered in the study, Trace Statistics and Maximum Eigen value statistics are applied and their results are given in tables 4 and 5. Statistics provided in tables demonstrate that there are two co-integrated vectors present in specified models leading the analysis towards long run coefficient values of the variables.

Table 4: Trace Statistics

Models	Hypothesized No. of CE(s)	Eigen Value	Trace Statistics	0.05 Critical Value	Probability
I	None *	0.655379	99.62748	76.97277	0.0004
	At most 1 *	0.604178	62.34160	54.07904	0.0077
	At most 2	0.352924	29.90389	35.19275	0.1663
	At most 3	0.228773	14.66868	20.26184	0.2460
	At most 4	0.147288	5.576651	9.164546	0.2261
II	None *	0.587129	85.63223	76.97277	0.0094
	At most 1 *	0.452046	54.67057	54.07904	0.0442
	At most 2	0.388652	33.61580	35.19275	0.0733
	At most 3	0.250821	16.39270	20.26184	0.1568
	At most 4	0.164383	6.285484	9.164546	0.1698

Table 5: Eigenvalue Statistics

Models	Hypothesized No. of CE(s)	Eigen Value	Max-Eigen Statistic	0.05 Critical Value	Probability
I	None *	0.655379	37.28588	34.80587	0.0248
	At most 1 *	0.604178	32.43771	28.58808	0.0153
	At most 2	0.352924	15.23521	22.29962	0.3560
	At most 3	0.228773	9.092031	15.89210	0.4240
	At most 4	0.147288	5.576651	9.164546	0.2261
II	None	0.587129	30.96166	34.80587	0.1341
	At most 1	0.452046	21.05476	28.58808	0.3357
	At most 2	0.388652	17.22310	22.29962	0.2200
	At most 3	0.250821	10.10722	15.89210	0.3247
	At most 4	0.164383	6.285484	9.164546	0.1698

D. LONG RUN RESULTS

Long run results of the econometric models are presented in table 6 which include government expenditure in model 1 and government revenue in model 2. There are five columns shown in the table, first column is about variables, second column is related to long run coefficient values, third column shows standard errors, t – statistics are provided in 4th column and fifth column contains conclusion about significance of variables.

Labor force is thought to be imperative factor for real output of economy. It may be significant cause of higher economic growth in the long run. Unfortunately, in this study, it is exhibited to be insignificant but with negative coefficient value in the long run.

The study finds positive relationship between Real GDP and Investment in Pakistan. The sign of coefficient is statistically significant at 1 percent level of significance justifying 1.28 and 1.52 percent rise in real GDP due to one percent rise in investment. Higher investment will increase industries in the economy which will increase production capacities of the industries causing higher real GDP in the longrun. Investment elasticities of real GDP are 1.28 and 1.52.

In the study, Government expenditure is revealed to be positive with real GDP in the long run with statistically significant coefficient value. Higher government expenditure will start new projects and lead to higher real GDP. It proposes that 1.28 percent enhancement in real GDP will appear due to one percent higher Government expenditure in Pakistan in the long run. Elasticity of real GDP with respect to government expenditure is 1.28.

Table 6: Johansen Results

Variables	Coefficient	Standard Error	t – value	Conclusion
		Model – I		
ELF	-0.5643	0.7320	-0.7709	Insignificant
INV	1.2869	0.2950	4.3625	Significant
GEXP	1.2817	0.2571	4.9850	Significant
GDPDEF	-0.5320	0.2426	-2.2028	Significant
Intercept	1.1009	1.3179	0.8354	Insignificant
		Model – II		
ELF	-0.1684	0.6111	-0.2756	Insignificant
INV	1.5252	0.3184	4.7897	Significant
GREV	-1.5248	0.2934	-5.1956	Significant
GDPDEF	-0.2559	0.1312	-1.9231	Significant
Intercept	0.3522	1.1888	0.2963	Insignificant

Government revenue is appeared to be negative with real GDP of Pakistan in the long run. The coefficient value is – 1.52 with statistically significant probability value. Generally, it is seen that government impose taxes for deficit financing of its budget that adversely affect purchasing power of the economy. It would lower aggregate demand of the economy and hence real GDP as well in the long run. On the average, real GDP of

Pakistan will lower by 1.52 percent due to one percent higher government revenue in the long run. Elasticity of real GDP with respect to government revenue is – 1.52.

GDP deflator is tended to decrease real GDP of Pakistan as shown in current analysis with significant coefficient value. Because when GDP deflator increases, it will increase the prices of the commodities thereby decreasing the purchasing power of people. The decreased aggregate demand will discourage the producers to produce so in this way total production will fall causing a decrease in real GDP. One percent higher price level will become cause of declining real GDP by 0.53 and 0.25 percent on the average in the longrun. Elasticities of real GDP with respect to GDP Deflator (Price Level) are – 0.53 and – 0.25.

E. SHORT RUN RESULTS

Vector error correction model (VECM), the short run results are described in table 7. In the short run, speed of adjustment term is the most important thing and it shows that how much time would be taken by the economy to reach at long run equilibrium from the short run equilibrium. The economy will converge towards long run equilibrium when there is negative sign attached with error correction term.

Table 7: Short run Dynamics

Variables	Model – I: D(LRGDP)		Model – II: D(LRGDP)	
	Coefficient	T - statistics	Coefficient	T - statistics
Speed of Adjustment Term	-0.067095	- 0.42697	-0.014921	-1.50752
D(LRGDP(-1))	-0.076885	-0.25915	-0.026563	-0.09121
D(LRGDP(-2))	-0.124011	-0.37854	-0.064628	-0.21220
D(LELF(-1))	-0.161864	-0.05049	0.703149	0.20148
D(LELF(-2))	1.763538	0.49515	-0.100325	-0.02884
D(LINV(-1))	0.393431	0.26597	1.068361	0.60216
D(LINV(-2))	-0.129886	-0.08550	1.024489	0.62921
D(LGOVTEXP(-1))	-2.284153	-1.51530	---	
D(LGOVTEXP (-2))	1.421572	1.05921	---	
D(LGDPDEF(-1))	1.659110	0.69239	-0.893162	-0.37453
D(LGDPDEF(-2))	-1.553321	-0.65122	-2.907070	-1.24025
D(LTGOVR(-1))	---		0.951497	0.58298
D(LTGOVR(-2))	---		0.133065	0.07929
Constant	0.210144	0.46043	0.004761	0.00887

V. CONCLUDING REMARKS

Fiscal policy does have considerable influence on real gross domestic product on Pakistan's economy by accelerating aggregate demand, employment and investment. Its

importance motivates young researchers to carry on the objective of analyzing effectiveness of fiscal policy on real GDP of Pakistan in the long run. For fulfillment of this aim, the study uses times series data ranging from 1976 to 2012. For elasticities, Log-Log form of the models is utilized. Stationary is checked through Augmented Dickey Fuller - unit root test. Akaike Information Criterion, Schwarz information Criterion, Hannan – Quinn Information Criterions are used to select an appropriate lag length. Long run results are estimated using Johansson cointegration test and for short run, vector error correction model is employed.

Unit root test confirm the use of Johansen Cointegration test due to having stationary of variables examined at 1st difference. Following an appropriate lag length, the results of long run reveal that investment and government expenditure have positive association with real GDP while government revenue and GDP Deflator are negatively related with real GDP in the long run. According to the short run results, economy converges towards the long run equilibrium due to the negative sign with error correction term.

To attain higher growth rates, the government of Pakistan should provide training and skill development programs for labor force to become more efficient and effective at their workplace. Government expenditure should be enhanced to attain macroeconomic objectives like employment generation, stable prices, higher growth rates, exchange rate stability etc. Government revenue would be favorable if there is no any change in taxation policy that may be harmful for the society.

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