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**The Relative Effectiveness of Monetary and Fiscal Policies in Economic Growth: A Case Study of Pakistan**

**Tariq Mahmood** ( Graduate Student, Department of Economics, University of Sargodha)

**Maqbool Hussain Sial** ( Dean Faculty of Management Sciences, University of Sargodha)

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## The Relative Effectiveness of Monetary and Fiscal Policies in Economic Growth: A Case Study of Pakistan

### Abstract

#### Author (s)

#### Tariq Mahmood

Graduate Student, Department of Economics, University of Sargodha.

#### Maqbool Hussain Sial

Dean Faculty of Management Sciences, University of Sargodha.

**Key words:** Fiscal policy, monetary policy, government spending, economic growth

In this study the role of monetary and fiscal policies in economic growth of Pakistan is studied using time series data for the period 1973-2008. The objective of this study is to discover the ways by which fiscal and monetary policies can be established to boost economic growth, highlight present Pakistan fiscal and monetary challenges to discover regions which may yield upgrading to the fiscal and monetary framework and consequently increase employment opportunities and the budget revenues in Pakistan. The augmented Dickey Fuller unit root procedure is used to check the time series properties. The Autoregressive Distributed Lag Model technique is used to find the long-run relationship between fiscal /monetary policy and economic growth. The results show that monetary and fiscal policies both play a significant role in the economic growth of Pakistan. The relationship between GDP and Government Current Expenditure (GCE) is found to be negative while, Currency in Circulation (CIR) and Government Development Expenditure (GDE) affect GDP positively in case of Pakistan.

### Introduction

The comparative significance of monetary and fiscal policy is a disputed matter in economics. The monetarists argued that spending was connected with changes in money and advocated that monetary policy was more effective in business cycles as compare to fiscal policy. Monetarists are not in favor of the fiscal policy due to its consequences of inflation and crowding out.

However, Keynesians recommended that enhancement in government expenditure or reduction in tax rate raise aggregate demand and consequently rising productivity. The previous studies have checked the significance of fiscal and monetary policy on different variables. Unfortunately the economic literature has not arrived at a compromise concerning the relative influence and helpfulness of both policies (Snyder and Bruce 2002).

The aim of macroeconomic policies is to guarantee that the country attains steady expansion of its economy without inflationary pressure. The two related systems are central bank and the ministry of finance. Central bank has control over financial situations and ministry of finance has authority over the characteristics of fiscal policy. There exists close

association between monetary and fiscal policies regardless of the truth that the two policies are dissimilar in conditions of range, communication system and time concerned in manipulating the economic conditions. The motivations of the relative effectiveness of monetary and fiscal policies are their interconnected goals (Nadeem and Farooq 2003).

The role of fiscal policy in economic growth is an undecided matter in economics. This issue has got additional attention due to increased operating expense on national security. There exist relations between budget surplus and discrepancy, the taxation and spending policies that organize budget results, and economic growth (Gale and Orszag 2003).

One school of thought consider that government participation in economic activity is essential for economic growth, but the other school of thought believe that government interventions are ineffectual and therefore lower the economic growth. In the economic literature, results are mixed (Amanja and Morrissey 2005).

Expansionary fiscal policy aims to enhance demand and productivity in the economy either directly, through larger government expenditures, or indirectly, through tax decline that encourage private spending and investment. Sound public finances, expected tax rates and spending plans are important

for sustainable economic growth. Fiscal framework believes that how the expenses and taxation and magnitude of government affect economic growth. The role of fiscal policy is important for stability and economic growth.

The tax rate and money expansion concurrently directs to stagflation. Thus the Government can choose either fiscal or monetary policy which will boost economic growth. If an economy was lower than full employment, money expansion will encourage economic growth by raising GDP. If the economy was higher than full employment level, money expansion can direct to stagflation, because workforce would require high salary and firms will increase prices. As a consequence wage price management will direct to stagflation. Hence the policy mix creates only stagflation (Reynolds 2001). Effectiveness of both fiscal and monetary policies in economic growth is important. During a depression, central banks condense rate of interest, but not lower than zero. If interest rates reduce to zero, monetary policy may be incompetent to promote the economy, and flexible fiscal policy would be essential to expand the economy (Walsh 2002).

The comparative importance of fiscal and monetary policy has been an unsettled subject in economic literature. Monetary policy was more effective than fiscal policy to boost economic growth in south Asian countries [Ali et al. (2006); Snyder and Bruce (2002); Boon and Zubaidi (1999); Rahman (2005)]. Fiscal policy could give a helpful accompaniment to monetary policy and there were significant restrictions to the worth additional of fiscal policy for the United States and for the European region, Muscatelli and Tirelli (2005). Both monetary and fiscal policies were equally important for economic growth in Nigeria, Ajisafe and Folorunso (2002).

Some studies analyzed the role of fiscal and monetary policies in economic growth of Pakistan based on the time series analysis of macroeconomic variables, whereas some studies analyzed the cross-country data for estimation. Cross-country regression analysis was based on the assumption that the nature and quality of data in different countries was similar. But it is a fact that nature and quality of data varied in different countries; due to which the results became doubtful.

There is a need to use individual country time-series data for undertaking econometric analysis about role of fiscal and monetary policies in economic growth to provide a sound foundation for a policy debate. This study investigates that how the Currency in

Circulation and Government Expenditures influence economic growth. The aim of this study is to learn the role of fiscal and monetary policies in economic growth by examining the case of a small, open and developing country, Pakistan. The present study evaluates the role of fiscal and monetary policies in economic growth with reference to Pakistan during the period 1973 to 2008.

#### **Techniques of Fiscal Policy:**

There are four common techniques of fiscal policy in Pakistan:

- (i) Taxation Policy;
- (ii) Public Expenditure Policy;
- (iii) Deficit Financing Policy;
- (iv) Public Debt Policy.

#### **Techniques of Monetary Policy:**

Monetary policy involves changes in money supply to influence rate of interest and aggregate demand, since changes in the money supply influences incomes, output and prices. The techniques of monetary policy may be classified as quantitative and qualitative. The quantitative measures are those which physically affect the amount of credit creation in the economy. Change in bank rate, open market operation, changes in reserve requirement, change in reserve ratio, change in marginal requirement and credit ceiling are the main quantitative measures. Moral suasion, consumer credit control, direct action and publicity are the main qualitative measures.

The comparative importance of fiscal and monetary policy has been an unsettled subject in economics. The selection of most favorable policy mix in emergent economies plays significant role in economic growth. Although the two policies are executed by different authorities but amendment in one policy necessarily manipulate the consequences of the other. In the recent years the discussion about the function of fiscal policy in inspiring economic growth has become most important. The literature implies that fiscal multipliers are characteristically positive but small, and if fiscal multipliers are negative, there is no obvious consent on the prerequisites for such a result (Valmont 2006).

Fiscal policy creates orientation to the dynamic utilization of the government budget for achieving the objective of economic growth. The fiscal policy plays a crucial function in macroeconomic stabilization. In emerging economies, where financial markets are comparatively straightforward and superficial, there is no decisive verification to propose that fiscal policy is ineffective.

The major macroeconomic objectives which Governments want to achieve through fiscal and monetary policies are to achieve full employment level, stability of general price level, accelerate economic growth and to maintain balance between exports and imports.

**Data and Methodology**

The time series data collected from the various Economic Surveys, State Bank’s Annual Reports for the period 1973-2008 are used. In this study, due concentration is given for consistency and correctness of the data. The data used in the study is first checked for the time series properties like stationary, serial correlation and multicollinearity and accordingly the specification of the model for the variables under consideration. To smooth out the data, natural logarithms of some variables are used. The review of literature about the role of fiscal and monetary policies in economic growth will help to create econometric models to estimate macroeconomic stability with the help of expenditure and taxation policies in Pakistan.

**Methodology**

This study used the Autoregressive Distributed Lag (ARDL) co-integration method to check the existence of a long-run relationship on the one hand and short-run dynamics of monetary and fiscal policies on the other hand. This study used error correction model to determine the short run dynamics of the system to time-series data for Pakistan’s economy, over the period 1973 to 2008. In this study, the impact of the fiscal and monetary policies on economic growth is examined in the following ways:

**Unit Root Test**

To examine whether a time series has a unit root, this study use Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF) unit root tests. The null hypothesis of non-stationarity is tested against alternative hypothesis of stationarity. The equation for Augmented Dickey Fuller (ADF) test is as follows:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \alpha \sum_{i=1}^m \Delta Y_{t-i} + u_t \dots(1)$$

In equation (1) ‘t’ is time period,  $U_t$  is a pure white noise error term and

$$\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2});$$

$$\Delta Y_{t-2} = (Y_{t-2} - Y_{t-3}); \text{ and so on.}$$

Source: Gujarati: Basic Econometrics, Fourth Edition (2003).

**Auto-regressive Distributed Lags (ARDL) Model**

The Co-integration procedure is applied if a time series is non-stationary at their level. To find out the long run relationship among the variables, this study uses the Autoregressive Distributed Lag (ARDL) Cointegration test by following Pesaran et al. (2001). An important benefit of ARDL is that it takes care of endogeneity of the independent variables. The ARDL method of estimation of long run relationship does not necessarily require all variables be of equal degree of integration, while other Co-integration methods require all variables having equal degree of integration. Moreover, the ARDL model estimation is feasible even when independent variables are endogenous. But ARDL method fails if one or more variables are integrated of order two i.e. I (2).

The autoregressive distributed lag model with p lags of  $Y_t$  and q lags of  $X_t$ , denoted ARDL (p,q), is  $Y_t = \beta_0 + \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + \dots + \beta_p Y_{t-p} + \delta_1 X_{t-1} + \delta_2 X_{t-2} + \dots + \delta_q X_{t-q} + U_t$

Where:

$\beta_0, \beta_1, \dots, \beta_p, \delta_1, \delta_2, \dots, \delta_q$  are unknown coefficients and  $U_t$  is the error term with  $E(U_t | Y_{t-1}, Y_{t-2}, \dots, X_{t-1}, X_{t-2}, \dots) = 0$

Source: Stock and Watson: Introduction to Econometrics (2004)

A long run relationship means that the variables under consideration move together over time so that short-term instability is corrected from the long-term trend. To find out the co-integration relationship between independent variables and dependent variable the unrestricted error correction version of the ARDL model is used as given below:

$$\Delta LGDP_t = \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta LCIR_{t-i} + \sum_{i=1}^p \beta_{2i} \Delta GDE1_{t-i} + \sum_{i=1}^p \beta_{3i} \Delta GCE1_{t-i} + \lambda_1 LGDP_{t-1} + \lambda_2 LCIR_{t-1} + \lambda_3 GDE1_{t-1} + \lambda_4 GCE1_{t-1} + \mu_t \dots \dots \dots (2)$$

When the long run relationship exists i.e. the variables are co-integrated; then there is an error correction representation. So the following error correction model (ECM) is estimated.

integration tests indicate whether or not a long-run relationship exists between the dependent variable and the independent variables. If variables are co-integrated, then the regressions on levels of variables deem meaningful otherwise spurious.

$$\Delta LGDP_t = \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta LGDP_{t-i} + \sum_{i=1}^p \beta_{2i} \Delta LCIR_{t-i} + \sum_{i=1}^p \beta_{3i} \Delta GDE1_{t-i} + \sum_{i=1}^p \beta_{4i} \Delta GCE1_{t-i} + \alpha ECM_{t-1} + \mu_t \dots \dots \dots (3)$$

Where:  
 LGDP the log of GDP  
 $\beta_0$  the intercept term,  
 LCIR the log of Currency in Circulation, GDE1 the Government Development expenditure divided by GDP,  
 GCE1 the Government Current expenditure divided by GDP,  
 $U_t$  the error term.

**The Stability Test**

The stability of the model is also verified with the help of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) tests of stability. The CUSUM and CUSUM of squares tests for the stability were introduced by Brown et al. (1975) to check the stationarity of regression equations. The Brown et al. (1975) method used the straight lines as limits. If CUSUM crosses these linear limits at least once, then it is believed that the regression equation is unstable.

**Results and Discussion**

Time series characteristics of the data The co-integration tests are performed on monetary/fiscal policy using the Dickey-Fuller (DF) unit root test on the residuals of the long-run equations. Co-

**Unit Root Tests**

The Dickey-Fuller and Augmented Dickey Fuller unit-root tests both with and without trend show the existence of unit roots (Table 1). In the first differences, these variables are stationary at 0.05 percent probability level. Therefore, the results reveal that all the variables are integrated of order one I(1). This is confirmed by the first differences of all variables which become stationary, I(0).

The results of the DF and ADF for level are given in the following Table 1. The results of the unit root tests show that the variable LGDP is found stationary at level with an intercept but not a trend and all other variables are non-stationary.

**Co-integration Tests**

The results of unit root tests show that all the variables included in the model are integrated at level or first difference. In this study, the Autoregressive Distributed Lag (ARDL) approach is applied. The null hypothesis of no long run relationship between the dependent and independent variables is tested against the alternative hypothesis that there is a long run relationship between the variables. If the value of F-statistic is greater than the upper bound value given by the Pesaran et al. (2001), then the null hypothesis is not accepted and it can be concluded that there exist a long run relationship among the considered variables.

$$\Delta LGDP_t = \beta_0 + \sum_{i=1}^1 \beta_{1i} \Delta LCIR_{t-i} + \sum_{i=1}^1 \beta_{2i} \Delta GDE1_{t-i} + \sum_{i=1}^1 \beta_{3i} \Delta GCE1_{t-i} + \lambda_1 LGDP_{t-1} + \lambda_2 LCIR_{t-1} + \lambda_3 GDE1_{t-1} + \lambda_4 GCE1_{t-1} + \mu_t \dots \dots \dots (4)$$

The results of the co-integration are discussed below.

**The Model**

In equations (4), the terms with the summation signs represent the short run dynamics of the model and the second part with  $\lambda$  sign represents the long run relationship. Where  $\beta_0$  is the intercept term and  $\mu_t$  is the white noise error term.

**Variable Addition Test (OLS Case)**

Dependent variable is dLGDP (Log of Gross Domestic Product).  
F-Statistic = 4.3686

The results show that there exists a long run relationship among the variables. As a consequence of existence of long run relationship among the variables, there is an error correction representation. The Autoregressive Distributed Lag (ARDL) approach is applied while conducting the bounds test for the null hypothesis of no co-integration.

The F-statistic is 4.3686 and the F-table critical value with an intercept and no trend at 0.05 percent probability level is 2.850 to 4.049. It is clear that F-statistic exceeds the upper bounds of critical value, thus null hypothesis of no long run relationship between the dependent and independent variables is not accepted showing clear long run relationship between the variables.

The next step is to estimate long run coefficients using the Autoregressive Distributed Lag (ARDL) method of co-integration and error correction model (ECM).

The test statistic of above table indicates that the Currency in Circulation (CIR) and Government Current Expenditure (GCE1) are significant at 0.01 percent probability level while, Government Development Expenditure (GDE1) is significant at 0.05 percent probability level. The signs of the coefficient of all the variables are according to the economic theory. The improvement in CIR and GDE will increase the GDP in Pakistan. The coefficient sign of Government Current Expenditure (GCE) is

negative indicating that an increase in Government Current Expenditure (GCE) decreases the Gross Domestic Product.

**Error Correction Model**

The error correction representation of the ARDL model is estimated as a next step after estimation of the long-run coefficients. The ECM shows the speed of adjustment to reinstate equilibrium in the model. The coefficient of ECM show that how rapidly a variable return to equilibrium and it should be

negative and significant. A highly significant error correction term is an additional confirmation of the existence of a stable long-run association.

The following equation is estimated.

$$\Delta LGDP_t = \beta_0 + \sum_{i=1}^1 \beta_{1i} \Delta LGDP_{t-i} + \sum_{i=1}^1 \beta_{2i} \Delta LCIR_{t-i} + \sum_{i=1}^1 \beta_{3i} \Delta GDE1_{t-i} + \sum_{i=1}^1 \beta_{4i} \Delta GCE1_{t-i} + \alpha ECM_{t-1} + \mu_t \dots \dots \dots (5)$$

Table 4 shows the error correction model (ECM) of ARDL (4,1,4,2,0) selected based on the Schwarz Bayesian Criterion. The value of error correction coefficient is -0.210 and it is statistically significant at 0.01 percent probability level. The result confirms an average speed of adjustment back to long run equilibrium to the coefficient of ECM (-1). The adjusted R-squared of the error correction model is 0.28, indicated that 28 percent of the deviation in the Gross Domestic Product is explained by the explanatory variables. The error correction term, which measures the speed of adjustment to reinstate stability in the model, show a negative sign and is statistically significant at 0.01 percent probability, confirming that long-run equilibrium can be attained. The results of error correction model indicate that Government Development Expenditure (GDE) has positive effect on Gross Domestic Product in Pakistan. The Currency in Circulation (CIR) is

presented in logarithmic form so, the coefficient of Currency in Circulation (CIR) is explaining directly elasticity. The above table shows that Currency in Circulation (CIR) affects Gross Domestic Product in the short-run with an elasticity of 0.219. The Government Development Expenditure (GDE) affects Gross Domestic Product positively in the short-run as well as in the long run. This positive relationship between GDE and GDP is consistent with Hong and Tang (2010) in OECD and Asian economies and Hussain et al. (2008).

**The Stability Test**

The stability of the model is also verified with the help of the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) tests of stability. The CUSUM and CUSUM of squares tests for the stability were introduced by Brown et al. (1975) to check the stationarity of regression equations. The Brown et al. (1975) method used the straight lines as limits. If CUSUM crosses these linear limits at least once, then it was believed that the regression equation was unstable. The diagnostic test examined the serial correlation, functional form, normality and heteroscedasticity associated with the model. The model is found to be stable as shown in figures 1 and 2 below.

**Conclusions and Recommendations**

**Conclusions**

The monetary and fiscal policies both play a significant role in the economic growth of Pakistan. The objective of this study is to establish some important instruments for monetary and fiscal policy

in Pakistan. The study uses annual time series data for the period 1973 to 2008. The study concludes that Currency in Circulation (CIR), Government Development Expenditure (GDE) and Government Current Expenditure (GCE) are important determinants of GDP in Pakistan. Econometric results propose that GDP is significantly influenced by Currency in Circulation (CIR), Government Development Expenditure (GDE) and Government Current Expenditure (GCE). The relationship between GDP and Government Current Expenditure (GCE) is found to be negative while, Currency in Circulation (CIR) and Government Development Expenditure (GDE) affect GDP positively in case of Pakistan.

**Recommendations**

Pakistan should adopt the measures to encourage Government Development Expenditure (GDE) and discourage Government Current Expenditure (GCE) in the country, which would lead to high economic growth in the country. There is need to increase Currency in Circulation (CIR) through monetary policy by providing opportunities of investment and provide incentives to investors to bring their savings into the market.

**Table 1: Unit Root Test at Level**

Variables	With an intercept but not a trend		Critical value 5%	With an intercept and a linear trend		Critical value 5%
	DF	ADF		DF	ADF	
LGDP	-4.5613	-3.2630	-2.9499	-4.5505	-3.2470	-3.5468
LCIR	-0.54373	-1.2253	-2.9499	-1.9438	-2.6889	-3.5468
GCE1	-1.6280	-1.7694	-2.9499	-1.5493	-1.7441	-3.5468
GDE1	-3.0753	-2.9733	-2.9499	-2.6315	-2.4056	-3.5468

**Table 2: Unit Root Test at First Difference**

Variables	With an intercept but not a trend		Critical value 5%	With an intercept and a linear trend		Critical value 5%
	DF	ADF		DF	ADF	
DLGDP	-6.2762 *	-5.4410*	-2.9528	-6.1095*	-5.2438*	-3.5514
DLCIR	-5.2219*	-8.1830*	-2.9528	-5.3776*	-8.2929*	-3.5514
DGDE1	-6.1581*	-4.3871*	-2.9528	-6.5221*	-4.8737*	-3.5514
DGCE1	-4.4431*	-3.9672*	-2.9528	-4.2758*	-3.7930*	-3.5514

Note: \* indicate the stationarity of the variables at 0.05 probability level of significance.

The results of the tests show that all the variables are stationary at first difference.

**Table 3: Estimated Long- Run Coefficients Using the ARDL Approach**

ARDL (4, 1, 4, 2, 0) selected based on Schwarz Bayesian Criterion

Dependent variable is LGDP (Log of Gross Domestic Product)

Regressor	Coefficient	T-Ratio	Probability
LCIR	1.04***	33.02	[0.000]
GDE1	3.20**	2.41	[0.022]
GCE1	-3.94***	-2.54	[0.017]
INPT	2.90***	4.799	[0.000]

Note: \*\* indicate the co-efficient is significantly different from zero at 0.05 probability level.

\*\*\* indicate the co-efficient is significantly different from zero at 0.01 probability level.

**Table 4: Error Correction Representation for the Selected ARDL Model**

ARDL (4, 1, 4, 2, 0) selected based on Schwarz Bayesian Criterion.

Dependent variable is dLGDP (Log of Gross Domestic Product)

Regressor	Coefficient	T-Ratio	[Probability]
dLCIR	0.219*	2.472	[0.190]
dGDE1	0.672***	2.510	[0.018]
dGCE1	-0.827**	-2.264	[0.031]
dINPT	0.609***	3.399	[0.002]
ECM(-1)	-0.210***	-2.522	[0.017]
R-Squared			0.365
R-Bar-Squared			0.280
DW-statistic			1.925

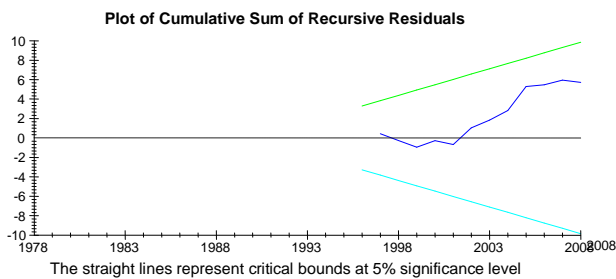
Note: \* show that co-efficient is significantly different from zero at 0.1 probability level.

\*\* show that co-efficient is significantly different from zero at 0.05 probability level.

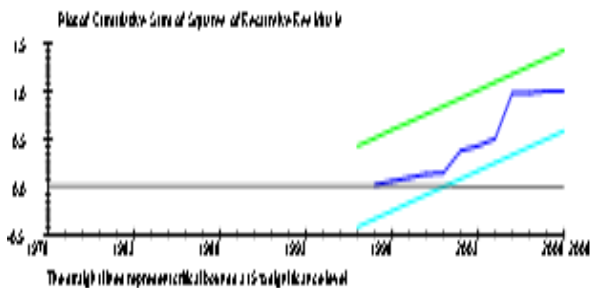
\*\*\* show that co-efficient is significantly different from zero at 0.01 probability level.



**Figure 1: CUSUM Test for Stability**



**Figure 2: CUSUMSQ for Stability**



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