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

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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

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Abstract

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.
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 at. (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

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:

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


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) Co-integration 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 Yt and q lags of Xt, denoted ARDL (p,q), is

\[
Y_t = \delta_0 + \delta_1 Y_{t-1} + \delta_2 Y_{t-2} + \ldots + \beta_0 Y_{t-p} + \beta_1 X_{t-1} + \ldots + \beta_p X_{t-p} + \delta_q X_{t-q} + U_t
\]

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


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:
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.

\[
\Delta \text{LGDP}_t = \beta_0 + \sum_{i=1}^{p} \beta_{1i} \Delta \text{LCIR}_{t-i} + \sum_{i=1}^{p} \beta_{2i} \Delta \text{GDE1}_{t-i} + \sum_{i=1}^{p} \beta_{3i} \Delta \text{GCE1}_{t-i} \\
+ \lambda_1 \text{LGDP}_{t-1} + \lambda_2 \text{LCIR}_{t-1} + \lambda_3 \text{GDE1}_{t-1} + \lambda_4 \text{GCE1}_{t-1} + \mu_t \tag{2}
\]

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.

\[
\Delta \text{LGDP}_t = \beta_0 + \sum_{i=1}^{p} \beta_{1i} \Delta \text{LGDP}_{t-i} + \sum_{i=1}^{p} \beta_{2i} \Delta \text{LCIR}_{t-i} + \sum_{i=1}^{p} \beta_{3i} \Delta \text{GDE1}_{t-i} + \sum_{i=1}^{p} \beta_{4i} \Delta \text{GCE1}_{t-i} + \alpha \text{ECM}_{t-1} + \mu_t \tag{3}
\]

Where:
- \text{LGDP} \quad \text{the log of GDP}
- \beta_0 \quad \text{the intercept term,}
- \text{LCIR} \quad \text{the log of Currency in Circulation, GDE1 the Government Development expenditure divided by GDP,}
- \text{GCE1 the Government Current expenditure divided by GDP.}
- \text{U}_t \quad \text{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-
The Model

In equations (4), the terms with the summation signs represent the short run dynamics of the model and the second part with λ sign represents the long run relationship. Where β₀ is the intercept term and µₜ 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.

\[
\Delta LGDP_i = \beta_0 + \sum_{i=1}^{l} \beta_i \Delta LGDP_{t-i} + \sum_{i=1}^{l} \lambda_i \Delta CIR_{t-i} + \sum_{i=1}^{l} \beta_i \Delta GDE_{t-i} + \sum_{i=1}^{l} \beta_i \Delta GCE_{t-i} + \mu_i + \epsilon_i
\]

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

<table>
<thead>
<tr>
<th>Variables</th>
<th>With an intercept but not a trend</th>
<th>With an intercept and a linear trend</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DF</td>
<td>ADF</td>
</tr>
<tr>
<td>LCIR</td>
<td>-0.54373</td>
<td>-1.2253</td>
</tr>
<tr>
<td>GCE1</td>
<td>-1.6280</td>
<td>-1.7694</td>
</tr>
</tbody>
</table>
Table 2: Unit Root Test at First Difference

<table>
<thead>
<tr>
<th>Variables</th>
<th>With an intercept but not a trend</th>
<th>Critical value 5%</th>
<th>With an intercept and a linear trend</th>
<th>Critical value 5%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DF</td>
<td>ADF</td>
<td></td>
<td>DF</td>
</tr>
<tr>
<td>DLGDP</td>
<td>-6.2762*</td>
<td>-5.4410*</td>
<td>-2.9528</td>
<td>-6.1095*</td>
</tr>
<tr>
<td>DLCIR</td>
<td>-5.2219*</td>
<td>-8.1830*</td>
<td>-2.9528</td>
<td>-5.3776*</td>
</tr>
<tr>
<td>DGDE1</td>
<td>-6.1581*</td>
<td>-4.3871*</td>
<td>-2.9528</td>
<td>-6.5221*</td>
</tr>
<tr>
<td>DGCE1</td>
<td>-4.4431*</td>
<td>-3.9672*</td>
<td>-2.9528</td>
<td>-4.2758*</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>Regressor</th>
<th>Coefficient</th>
<th>T-Ratio</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCIR</td>
<td>1.04***</td>
<td>33.02</td>
<td>[0.000]</td>
</tr>
<tr>
<td>GDE1</td>
<td>3.20**</td>
<td>2.41</td>
<td>[0.022]</td>
</tr>
<tr>
<td>GCE1</td>
<td>-3.94***</td>
<td>-2.54</td>
<td>[0.017]</td>
</tr>
<tr>
<td>INPT</td>
<td>2.90***</td>
<td>4.799</td>
<td>[0.000]</td>
</tr>
</tbody>
</table>

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)

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

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.
The Relative Effectiveness of Monetary and Fiscal Policies.....

Figure 1: CUSUM Test for Stability

![CUSUM Test for Stability](image1)

Figure 2: CUSUMSQ for Stability

![CUSUMSQ for Stability](image2)

References


