T h e J o u r n a l o f D e v e l o p i n g A r e a s
Volume 58 No. 4 Fall 2024

AN ARDL APPROACH TO INVESTIGATE THE EFFECTIVENESS OF FISCAL AND MONETARY POLICIES IN MAKING BANGLADESH, A ROLE MODEL OF DEVELOPMENT

Sukanta Chakraborty
University of Chittagong, Bangladesh
chakraborty.sukanta@cu.ac.bd

ABSTRACT

The purpose of the study is to analyze the relative efficacy of monetary and fiscal policies in fostering economic growth in Bangladesh concerning predictability, speed, and magnitude. Moreover, it aims to find the relationship between the economic boom of Bangladesh and two measures of macroeconomic management i.e., monetary and fiscal policy. The ARDL model and bound test are applied to examine the long-term link between monetary policy, fiscal policy, and economic growth. Data is obtained from the World Development Indicator (WDI) for Bangladesh for the period 1974 to 2022. Several diagnostics tests like CUSUM and CUSUMQ are used to identify both the strengths and weaknesses of the models. The findings demonstrated a long-term correlation between the two policies and economic growth. According to the calculated short-run coefficients, the short-term effect of fiscal policy is mentionable but the effect of monetary policy is negligible in the short term. But over time, the immediate effects become noteworthy. The long-term outcomes indicated that both fiscal and monetary policies have a favorable and substantial long-term impact on economic growth. The result shows fiscal policy is more effective compared to monetary policy for making Bangladesh, a role model of Bangladesh. Furthermore, all the diagnostics tests showed the stability of the estimated ARDL model. Expansionary fiscal and monetary policies lead to higher government spending and an increase in the money supply, which raises GDP levels. Conversely, if government spending and the money supply decline (contractionary fiscal and monetary policies), the GDP level falls. As a result, this study suggests using expansionary policies to boost Bangladesh's economy.

JEL Classifications: C01, C22, C58, E52, E62, E63.
Keywords: Fiscal policy, Monetary policy, Economic growth, ARDL.
Corresponding Author's Email Address: chakraborty.sukanta@cu.ac.bd

INTRODUCTION

The two most important macroeconomic policies are monetary policy and fiscal policy; other policies that deal with welfare, stability, and economic progress are components of these two policies (Bishai & Kung 2007; Cannon 2004).

The government's initiative to make discretionary changes to its borrowing, taxation, and spending patterns and levels to accomplish certain economic goals, such as job creation, income equality, economic development, and stable economic growth, is known as fiscal policy. On the other hand, monetary policy is a set of actions to control a nation's overall

money supply and achieve economic growth.

The government can directly manage those policies by using use policy instruments. There are two types of policy instruments to be classified: monetary policy instruments and fiscal policy instruments. Government expenditure, taxation, public loans, and deficit financing are examples of fiscal policy instruments whereas the bank rate or repo rate, open market operations (OMO), cash reserve ratio (CRR), and particular credit limitations are the four main tools used in monetary policy.

Fiscal policies can affect the economy in the following ways proposed by Balducci (2005):

(1) investing directly in infrastructure that creates jobs i.e., obtaining full employment
(2) boosting the economic growth
(3) controlling the debt of the country
(4) controlling the inflation and
(5) assuring income equality

However fiscal policy efficiency is limited by several factors, including the need to forecast goal variables like GDP, consumption, costs, investment, and technology shifts. Moreover, underdeveloped countries have limited fiscal policy functioning due to low-income levels, low population share, broad non-monetized sectors, and prevalent bribery and administration inefficiency.

Monetary policy plays a crucial role in promoting economic growth in underdeveloped countries. It encourages savings induction, which is essential for capital formation and investment in productivity. Monetary authorities provide banking institutions and incentives to encourage savings, such as high interest rates and deposit protection. However, some factors are limiting the effectiveness of the monetary policy, the most important are proposed by Bruno & Shin (2015):

(1) Underdeveloped monetary and capital markets;
(2) Lack of integrated interest rate structure;
(3) People's banking habits;
(4) The Commercial Bank's lack of cooperation; and
(5) Literacy and social impediments.

LITERATURE REVIEW

The effectiveness of Japanese fiscal policy from 1976 to 1999 is examined by Kuttner & Posen (2002) using a systemic VAR analysis of real GDP, tax receipts, and government expenses. They found that both tax cuts and public works spending, in their respective forms, had significant stimulant impacts.

To evaluate the effect of monetary and fiscal policy on economic activity in Serbia, regression analysis, unit root, and cointegration studies were performed by using a series of quarterly data sets covering the years 2003–2012 (Biljana & Tamara, 2013). The results imply that monetary policy is more successful in promoting economic development than fiscal policy. Consequently, the ultimate conclusion is that to improve performance going forward, the government needs to focus more on fiscal policy.

To ascertain which of these two policies was more effective in fostering economic growth in Turkey between 1998 and 2016, Özer & Karagöl (2018) analyzed the effectiveness of fiscal and monetary policies in doing so between 1998 and 2016. They examine the effectiveness of monetary and fiscal policies in terms of growth using time series econometric approaches such as Granger causality tests, ARDL Bounds testing, and

structural break unit root tests. The monetary policy variable does not produce Granger causation; rather, it only affects growth in the short term. Fiscal policy, on the other hand, has a long-term major impact on development and causes it.

Ajisafe & Folorunso (2002) employed cointegration and error correction modeling approaches to evaluate the relative impact of fiscal and monetary policies on economic activity in Nigeria. Using a unit root test, annual series data from 1970 to 1998—mostly from the CBN Statistical Bulletin—were used to examine the time series aspects of the variables. Their conclusions indicate that monetary policy, as opposed to fiscal policy, has a significant impact on economic activity in Nigeria. The Nigerian economy is becoming increasingly distorted as a result of the government's emphasis on fiscal policy. Nonetheless, they do think that fiscal and monetary policy should work in tandem.

Simon (2012) investigates how well fiscal policy works in Zimbabwe to promote economic growth. The study employed yearly data spanning from 1980 to 2010. The Johansen Approach was used to conduct the cointegration test and the Augmented Dickey-Fuller method was used to examine the unit roots of the series. Error-correction models were estimated to account for short-run dynamics. The cointegration test confirms the long-run relationship between government consumption expenditure and income tax, which had a positive impact on economic growth during the study period, but government capital expenditure had a negative impact.

Using a Panel Vector Auto-Regressive (PVAR) model, the macroeconomic consequences of fiscal and monetary policy shocks in five significant emerging market economies: Brazil, Russia, India, China, and South Africa were investigated (Jawadi, Mallick & Sousa 2016). They show that while government spending shocks have strong Keynesian impacts, monetary tightening decreases real economic activity and tightens liquidity market conditions. In support of an accommodating approach between fiscal and monetary policy—which is essential for political and economic decision-making—they also find evidence. The researchers' conclusions hold up even after taking into consideration periods of extreme unpredictability, such as financial and world crises.

To determine if delegation to an independent body has an impact, Khemani (2007) examines the impact of partisan politics on two types of budgetary transfers to states in the Indian Federation over the years 1972–1995. Transfers assigned to an independent agency serve to limit such partisan influence, even while transfers decided by the central political executive are dispersed to favor specific states that are politically significant for the central governing party.

When it is in the case of Bangladesh, we found a short literature. Younus (2012) investigates the relative importance of monetary and fiscal policies in altering real output growth in Bangladesh through a Co-integration and Vector Error Correction Approach. The outcomes of the study demonstrate that monetary policy has relatively stronger impact than that of fiscal policy in altering output growth in Bangladesh.

The relative effectiveness of monetary and fiscal policies on economic growth in Bangladesh for the period from fiscal year 1974 to 2015 was explored by employing cointegration and the Vector Error Correction Model (VECM) (Hasan *et al*., 2016). That study concluded that monetary policy is a more effective channel than fiscal policy to promote economic growth in the short run and long run in Bangladesh

Correlation, regression, test of hypothesis, ANOVA, and trend analysis were used to identify the impact of significant components of fiscal policy and monetary policy that

determine the level of economic growth in Bangladesh (Islam, Akter & Sarker 2018). The study found that there is a high degree of positive correlation between the dependent variable and independent variables.

Karim (2019) empirically examines the effectiveness of these measures with the aid of structural vector autoregressive (SVAR) and Choleskey factorization methods applying time series data on policy and non-policy macro variables of Bangladesh covering a period fiscal year (FY) 1971–2017. It concludes that Bangladesh should focus on a combination of expansionary monetary policies and restrictive fiscal policies as the most beneficial approach.

All of them use the Vector Autoregressive Model and Vector Error Correction model to examine the correlation among GDP, fiscal policy, and monetary policy. However, none of them use the ARDL approach. In an economy, change in any economic variables may bring change in another economic variable beyond time. This change in a variable is not reflected immediately, but it is distributed over future periods. To determine the dynamic influence of a variable on other variables, there are multiple distributed lag models such as polynomial, geometric, and other distributed lag models in econometrics. However, the ARDL model addresses the distributed lag problem more efficiently than these models. Moreover, the ARDL model addresses the issue of collinearity by allowing the lag of the dependent variable in the model with other independent variables and their lags.

Given this background, the purpose of this research is to investigate, using the ARDL model created by Pesaran & Shin (2012), the relative effects of monetary and fiscal policy measures on output growth in Bangladesh. The study uses data from 1974 to 2022 and employs contemporary time-series data analysis methodologies. Specifically, we apply the Auto Regressive Distributed Lag (ARDL) bounds testing method to cointegration to investigate the dynamic influence of monetary and fiscal policy actions on output expansion. To the best of our knowledge, this study is the first effort to look at this problem in Bangladesh in terms of the time and methodology used.

METHODOLOGY

The ARDL approach was majorly popularized due to its numerous advantages. The primary advantage of the ARDL model is the fact that it can be applied irrespective of I (0) or I (1) variables. The second advantage of this model is that it can take a wide range of numbers of lags that are captured in the data-generating process, especially in a more general-to-specific approach of the ARDL modelling framework. On top of that, the Dynamic Error Correction Model (ECM) can be generated from the ARDL by applying a simple linear transformation. Furthermore, economists have commonly recommended the use of ADRL because the model minimizes mistakes and random errors that may be experienced due to non-stationary series data. That's why we adopt ARDL in this study. After having the results, the relative effectiveness of monetary and fiscal actions in stimulating economic growth is evaluated based on three criteria, namely the "magnitude", "predictability", and "speed" of the impact of these two policies on economic growth according to the approach utilized by the previous studies (Andersen and Jordan 1968; Orsmond 1992; Hasan 2001; Tarawalie and Kargbo 2020).

Study Variables

In our study, we use the GDP as a dependent variable as a country's economic development is well represented by its GDP. Later we use the government's final spending and broad money supply as independent variables. Here, the government's final spending is representative of fiscal policy because it reflects the government's attitude and action regarding its fiscal policy. On the other hand, the money supply serves as a stand-in for monetary policy as whether it is expansionary or contractionary monetary policy can be found from the volume of the money supply. The details of the study variable are given in Table 1.

TABLE 1. DETAILS OF THE STUDY VARIABLES

Type of the variables	Variable Name	Definition
Dependent Variable	GDP	GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for the depreciation of fabricated assets or for the depletion and degradation of natural resources. Data are in the current local currency.
Independent variables	Government's final spending	General government final consumption expenditure includes all government current expenditures for purchases of goods and services. It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation. Data are in the current local currency.
	Money Supply	Money supply i.e. broad money is the sum of currency outside banks; demand deposits other than those of the central government; the time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveler's checks; and other securities such as certificates of deposit and commercial paper. Data are in the current local currency.

Data

Data for the study variable was collected from the database of the World Bank (https://databank.worldbank.org/source/world-development-indicators) and the time for the study was between 1974 and 2022.

Econometric Estimation Method

As stated above if the underlying variables are of order I(0), I(1), or both, the ARDL cointegration technique would be applied according to Pesaran & Shin (2012). If the underlying variables are of order I (2), it cannot be employed. On the other hand, unit root tests are advised to prevent the failure of ARDL approaches and effort to prevent pointless

efforts, since variables that integrate the order I(2) contribute to the methodology's failure. The ARDL approach can be employed in place of the Johansen and Juselius approach if the trace, maximum eigenvalue, or F-statistics demonstrate that the variables (i.e., underlying variables) have a single long-run connection. The ARDL methodology offers a logical foundation for measuring and estimating cointegration relations in the form of a single equation. When the sample data size is small ($n < 30$) or finite and the F-statistics (Wald test) establish that there is a single long-run relationship, the ARDL error correction representation becomes relatively more successful.

The ARDL model is reparameterized into the Error Correction Model (ECM) when there is only one cointegrating vector among the underlying variables. The re-parametrized result reveals the long-run connection and short-run dynamics of the underlying variables. When there are multiple long-term relationships, the ARDL approach cannot be applied.

The ARDL procedure follows 4 steps:

(1) Unit root test: Unit root tests must be used in the initial step to verify the time series variables' stationary characteristics. Applying the augmented Dickey-Fuller test (ADF) unit root test is our choice. We can use the ARDL technique after we are certain that none of the variables are integrated into order two.

(2) Bound testing: In the second stage, we test whether there is a long-run relationship between variables. The following model is estimated for bound testing proposed by Pesaran & Shin(2012).

$$\Delta y_t = -\sum_{i=1}^{p-1} \gamma_i^* \Delta y_{t-1} + \sum_{j=1}^{k} \sum_{i=0}^{q_j-1} \Delta X_{j,t-i'} \beta_{j,i^*} - \rho y_{t-1} - \alpha - \sum_{j=1}^{k} X_{j,t-1'} \delta_j + \epsilon_t$$

To check if there is a long-run relationship, we test the following null hypothesis:

$$\rho = 0$$
$$\delta_1 = \delta_2 = \cdots = \delta_k = 0$$

(3) In the third step, we estimate the ARDL representation given by the following model (Pesaran & Shin, 2012)

$$\Delta y_t = -\sum_{i=1}^{p-1} \gamma_i^* \Delta y_{t-1} + \sum_{j=1}^{k} \sum_{i=0}^{q_j-1} \Delta X_{j,t-i'} \beta_{j,i^*} - \hat{\phi} EC_{t-1} + \epsilon_t$$

$$EC_t = y_t - \alpha - \sum_{j=1}^{k} X_{j,t'} \hat{\theta}_j$$

$$\hat{\phi} = 1 - \sum_{i=1}^{p} \hat{\gamma}_i$$

$$\gamma_i^* = \sum_{m=i+1}^{p} \hat{\gamma}_m$$

$$\beta_{j,i^*} = \sum \beta_{j,m}$$

Here, where t refers to the time period (i.e. year); ε represents the error term, β_i (where $i = 1, 2$) represents the coefficients of the examined explanatory variables,

where Δ represents the first difference operator;δ_1, δ_2 are the long-run parameters; and p is the optimal lag.

(4) In the last step we confirm the validity of the model. If the model passes the diagnostic tests such as the normality test, Serial correlation test, and specification test, then the results found by the ARDL model are said to be valid.

RESULTS AND DISCUSSIONS

Unit Root Test Findings

At first, we apply the augmented Dickey-Fuller test (ADF) unit root test to find the stationary or non-stationary status of the study variables.

Table 2 presents the results of ADF Unit Root tests. We can conclude from the results that the variables under study are stationary at 1st difference, that is I(1), at 5% level of significance. Since the variables are all integrated into order 1, the decision to apply the ARDL Bounds test approach to cointegration could be justified.

TABLE 2. UNIT ROOT TEST RESULTS

Null hypothesis: the variable has a unit root

Variables	Augmented dickey fuller (ADF)				Integration order
	Level		First difference		
	t-stat	p-value	t-stat	p-value	
LGDP	-3.391139	0.0646	-11.33173	0.0000	I(1)
LFISCAL	-0.600815	0.8607	-5.611116	0.0000	I(1)
LMONEY	-2.078825	0.2538	-4.943336	0.0002	I(1)

ARDL Bound Test Findings

In the second step, we apply the bound test to check the long-run relationship among the variables. The ARDL bound test results are shown in Table 3. This test is used whether the variables are co-integrated, in other words, whether the variables have a long-run relationship. We can see from Table 3 that the F-statistics is 4.77 which is greater than the 5 percent level significance bound. This implies that the null hypothesis of no cointegration has been rejected. Therefore, we can see that there is a long-run relationship between fiscal and monetary policies with economic growth in Bangladesh.

TABLE 3. ARDL BOUND TEST RESULTS

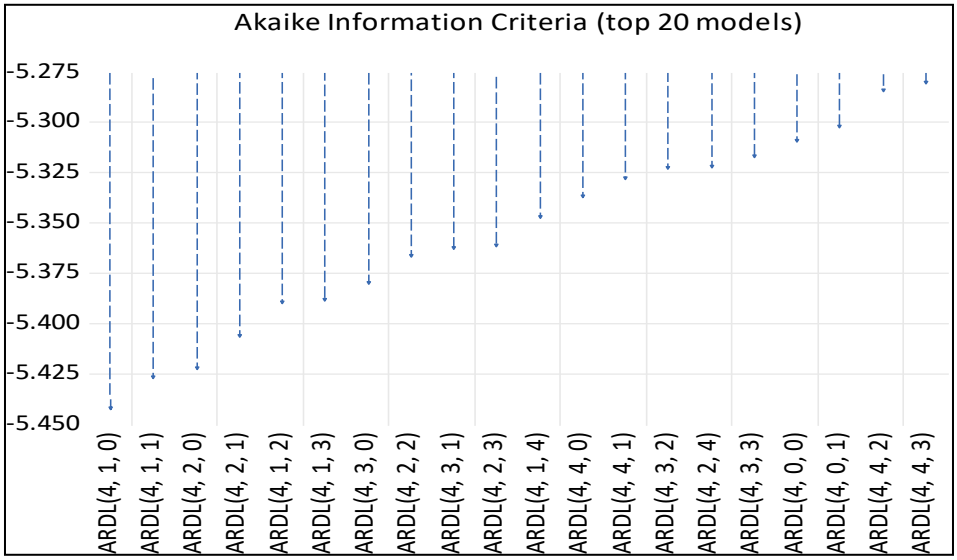
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F - statistic	4.768948	2
Critical Value Bounds		
Significance	I(0) bound	I(1) bound
10%	2.63	3.35
5 %	3.10	3.87
2.5%	3.55	4.38
1 %	4.13	5.00

Selection of The Model

Figure 1 shows the procedure for selecting the optimal lag length of the ARDL model. We choose the model where AIC is minimum. Figure 1 shows that AIC is the minimum when we choose ARDL(4,1,0). Therefore, the optimal model is ARDL (4,1,0).

FIGURE 1. CHOOSING THE CORRECT MODEL



ARDL Findings

The estimation results of the long-run relationship indicate that the coefficients of the two explanatory variables included in the model encounter the positive expected sign. Yet, while the coefficient of the variable that reflects the fiscal action is significant at the 1% level of significance, the variable that measures the monetary action is significant only at the 5% level. This reflects the relatively poor significance of the monetary action's impact on economic activity in the long run.

According to the proposed methodology, we consider the first criterion "predictability". The predictability of the response of economic activity to a given policy action can be measured by the t-statistic value of the coefficient of the variable measuring that action (Andersen and Jordan, 1968). The larger the value of the t-statistic of a given explanatory variable's coefficient, the greater the predictability of this variable's impact on the dependent variable. The t-statistic values of the coefficients of the two variables examined in our model are as follows: 2.707 for the monetary action variable and 5.774 for the fiscal action variable. As such, based on the "predictability" criterion, we can conclude that the response of the economic activity to the fiscal action, in the long run, is more predictable than the response of the economic activity to the monetary action.

Secondly, we consider another criterion "magnitude". This magnitude can be estimated from the absolute size of the regression coefficients. The larger the size of the coefficient of a given policy variable, regardless of its sign, the greater the magnitude of

its impact on the economic activity. A common approach is to change the regression coefficients to "beta coefficients". In this case, the beta coefficient considers the past variation of changes in each explanatory variable relative to the past variation of changes in the dependent variable (i.e.GDP). The size of the beta coefficients can then be directly compared to measure the relative contribution of each explanatory variable to variations in the dependent variable according to Andersen and Jordan (1968).

For a given independent variable, the beta coefficient is calculated as the product of the estimated regression coefficient and the ratio of the standard deviation of the independent variable to the standard deviation of the dependent variable. Based on the estimation results of the long-run relationship as expressed in Table 4, we measure the beta coefficients of the two examined explanatory variables. The beta coefficients are estimated to be 0.60, and 0.27 for the government expenditure variables and money supply respectively. Accordingly, we can conclude from the results of beta coefficients that the fiscal policy variable exerts the dominant impact on nominal GDP growth in the long run whereas the monetary policy variable has the least effect.

Regarding the "speed" criterion of the relative impact of monetary and fiscal policy actions on economic activity, this can be tested by examining the characteristics of the lag structure in the estimated regression. Hence, this criterion is relevant to the short-run rather than the long-run form of the ARDL approach, as the former shows the distributed lags.

The short-run (ECM) results as presented in Table 4 reveal that the fiscal policy variable has a significant impact on the change in nominal GDP growth rate and this impact is positive. However, the monetary policy variable is dropped from the short-run form according to the automatic lag selection procedure. Moreover, the coefficient of the ECM(-1) which measures the speed of adjustment is significant and has the expected negative sign, confirming that there exists a long-run causality relationship between the examined variables. The absolute value of this coefficient indicates that around 28% of the disequilibrium from the long-run equilibrium path in any given period will be corrected in the following period.

Based on our estimation results we can argue that fiscal policy seems to be more effective than monetary policy in stimulating the economic activity in Bangladesh. According to this specification, the impact of the fiscal policy action on the growth rate of nominal GDP is larger and more predictable than that of the monetary policy action.

TABLE 4. ARDL ESTIMATION RESULTS

Long run results: restricted constant and no trend

Variable	Coefficient	Std.Error	t-Statistic	Prob.
LFISCAL	0.638961	0.110657	5.774229	0.0000
LMONEY	0.239229	0.088371	2.707109	0.0102
Constant	2.486504	0.205932	12.07438	0.0000

$$EC = LGDP - (0.6390 * LFISCAL + 0.2392 * LMONEY + 2.4865)$$

Short-run results (ECM Form): restricted constant and no trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D (LGDP (-1))	0.019129	0.087979	0.217430	0.8291
D (LGDP (-2))	0.109480	0.067908	1.612170	0.1154
D (LGDP (-3))	0.242492	0.045352	5.346911	0.0000
D(LFISCAL)	0.398977	0.055195	7.228465	0.0000
CointEq (-1)	**-0.285415**	**0.062850**	**-4.541198**	**0.0001**

Diagnostic Tests

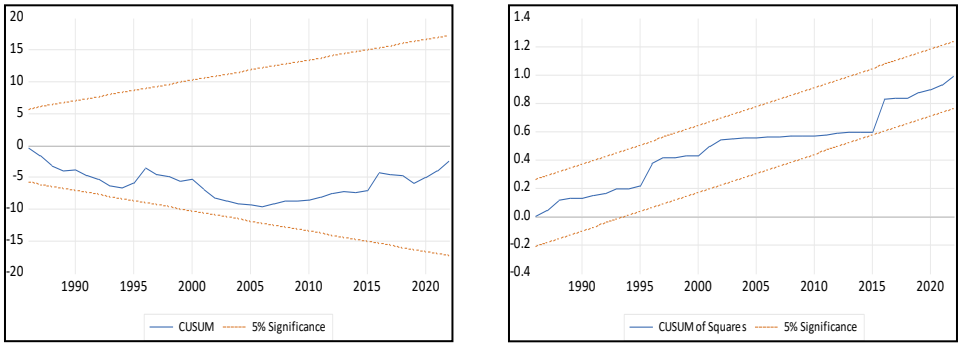
The results of the diagnostic tests of our model, as shown in Table 5 confirm the robustness of the estimates, as they do not indicate any evidence of autocorrelation, or heteroscedasticity at 5% level of significance. However, it violates the non-normal distribution property of residuals at 5% level of significance and it may be due to the short series sample size. but if we consider 10% level of significance our estimated model passes all the diagnostic tests. In addition, the null hypothesis of the Ramsey RESET test cannot be rejected implying that the model is well specified.

TABLE 5. DIAGNOSTIC TEST RESULTS

Diagnostic tests	**Test statistic**	**Probability**
Breusch-Godfrey Serial Correlation LM test (2 lags)	F-statistic: 1.490626 Obs*R-squared: 3.532173	0.2392 0.1710
Ramsey RESET Test	F-statistic:1.887946	0.1779
Heteroscedasticity (Breusch-Pagan-Godfrey)	F-statistic:0.792370 Obs*R-squared:5.866426	0.5984 0.5554
Normality	11.23216	0.0306
CUSUM	Stable	
CUSUM SQ	Stable	

To check the estimated ARDL model's stability of the coefficients of the long run with that of the short run between economic growths and its causes, the study employed the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares (CUSUMQ). If the plots lie within the 5% range of significance level, the null hypothesis states that the coefficients in the error correction models (ECM) are stable and cannot be rejected; if otherwise, we reject the null hypothesis of the constancy of the coefficients. From Figure 2(a) and (b), it can be deduced that both the plots of CUSUM and CUSUMQ statistics stay within the critical boundaries; thus, we conclude that we cannot reject the null hypothesis.

FIGURE 2. (A) PLOT OF THE CUMULATIVE SUM OF RECURSIVE RESIDUALS AND (B) PLOT OF THE CUMULATIVE SUM OF SQUARES OF RECURSIVE RESIDUALS



a) b)

CONCLUSIONS

In this work, we use the Auto Regressive Distributed Lag (ARDL) Bounds testing approach to investigate the relative efficacy of fiscal and monetary policies in fostering output growth in Bangladesh from 1974 to 2022. Specifically, we evaluate the relative contributions of fiscal and monetary policy measures to Bangladesh's economic growth in terms of "predictability," "magnitude," and "speed."

We apply our model to the real GDP by taking the natural logarithm of the two variables: real broad money supply and real government final consumption expenditure. The results of the ARDL Bounds test show that the variables under investigation have a long-term "cointegration" relationship. Furthermore, it is discovered that the long-run form of the coefficients for the two explanatory variables exhibits the anticipated positive sign, suggesting that the monetary and fiscal policy measures have a positive effect on Bangladesh's economic activity.

The "Keynesian" theory—which holds that fiscal policy is more crucial to achieving economic stability than monetary policy—is supported by the results of our estimation. Specifically, through an analysis of the model's long- and short-term versions, we discover that fiscal policy influences real GDP more quickly, predictably, and in greater amounts than monetary policy.

The empirical research findings reported in this study demonstrate that fiscal and monetary policies can stimulate Bangladesh's economy and eventually lead to macroeconomic stability. However, if the goal is to encourage real economic activity, policymakers are recommended to prioritize fiscal policy over monetary policy. Greater, quicker, and more consistent gains in real GDP are typically seen when government final consumption expenditure rises. This is in contrast to the effect of a rising wide money supply. Additionally, because the fiscal and monetary policies have a big influence on

Bangladesh's economic activity, there needs to be good and efficient coordination between them.

The present analysis presented in this paper can be expanded upon in several ways in subsequent research by employing large-scale structural models such as the structural VAR model etc. or combining Randomized Experiments and Structural Modelling for the same research question. Moreover, quarterly or monthly data on the variables under investigation can be used to examine whether they relate to the economy of Bangladesh or any other developing nation.

DISCLOSURE STATEMENT

There are no competing interests to declare.

REFERENCES

Ajibola, RA & Folorunso, BA 2002, 'The relative effectiveness of fiscal and monetary policy in macroeconomic management in Nigeria', *The African Economic and Business Review*, vol.3, no.1, pp. 23–40.

Andersen, LC & Jordan, JL 1968, 'Monetary and fiscal actions: A test of their relative importance in economic stabilization', *Review*, vol.50, https://doi.org /10.20955 /r.50.11-24.qox

Balducci, R 2005, *Innovation, Unemployment and Policy in the Theories of Growth and Distribution,* UK. https://doi.org/10.43 37/97 81845428167.00021

Biljana, R & Tamara, R 2013, 'The effectiveness of monetary and fiscal policy in Serbia', *Industrija*, vol.41, no.2, pp. 103–122. https://doi.org/10.5937/industrija41-4011

Bishai, DM & Kung, YT 2007, 'Macroeconomics. in Macrosocial Determinants of Population Health', *Springer*, pp. 169-191. https://doi.org/10.1007/978-0-387-70812-6_8

Bruno, V & Shin, HS 2015, 'Capital flows and the risk-taking channel of monetary policy', *Journal of Monetary Economics*, vol.71, pp.119–132. https://doi.org /10 .1016/j.jmoneco.2014.11.011

Cannon, E 2004, 'Advanced macroeconomics', *The Economic Journal*, vol.114, no.493, https://doi.org/10.1111/j.0013-0133.2004.191_16.x

Hasan, MS 2001, 'Monetary and Fiscal Impacts on Economic Activities in Bangladesh: Further Evidence', *Bangladesh Development Studies, Bangladesh Institute of Development Studies (BIDS)*, vol.27, no.4, pp. 101–120.

Hasan, MA, Islam MAH, Islam, MA, Hasan, MDA & Wadud, MA 2016, 'The Relative Effectiveness of Monetary and Fiscal Policies on Economic Growth in Bangladesh', *Economics*, vol.5, no.1, pp. 1-7. https://doi.org/10.11648/j.eco.2016 0501.11

Islam, MS, Akter, M & Sarker, SI 2018, 'Economic Growth in Bangladesh: Impact of Fiscal Policy and Monetary Policy', *Romanian Economic Business Review*, vol.13, no.2, pp. 45–57.

Jawadi, F, Mallick, SK & Sousa, RM 2016, 'Fiscal and monetary policies in the BRICS: A panel VAR approach', *Economic Modelling*, vol. 58, pp. 535–542. https://doi.org/10.1016/j.econmod.2015.06.001

Karim, MS 2019, 'An empirical evaluation of monetary and fiscal policy effects

in Bangladesh' In working paper series: ADB South Asia Working Paper Series.

Khemani, S 2007, 'Does delegation of fiscal policy to an independent agency make a difference? evidence from intergovernmental transfers in India', *Journal of Development Economics*, vol.82, no.2, pp. 464–484. https://doi.org/10.1016/j. jdeveco.2006.04.001

Kuttner, K & Posen, A 2002, 'Fiscal Policy Effectiveness in Japan', *Journal of the Japanese and International Economies*, vol.16, no.4, pp. 536–558.

Orsmond, DWH 1992, 'The potency of monetary and fiscal policies in sub-Saharan countries: St Louis Model estimates', *African Review of Money, Finance and Banking-Supplement to Savings and Development*, no.01, pp.17-28. https://www .africabib.org/rec.php?RID=097900540

Özer, M & Karagöl, V 2018, 'Relative effectiveness of monetary and fiscal policies on output growth in Turkey: An ardl bounds test approach', *Equilibrium. Quarterly Journal of Economics and Economic Policy*, vol.13, no.3, pp.391–409. https://doi.org/10.24136/eq.2018.019

Pesaran, MH & Shin, Y 2012, 'An autoregressive distributed-lag modelling approach to cointegration analysis', *Econometrics and Economic Theory in the 20th Century*, pp.371–413. https://doi.org/10.1017/ccol521633230.011

Simon, M 2012, 'Effectiveness of fiscal policy in economic growth: the case of Zimbabwe', *International Journal of Economics and Research*, vol.3, no.6, pp. 93–99.

Tarawalie, A & Kargbo, N 2020. 'Efficacy of fiscal and monetary policy in Sierra Leone: an ARDL bound testing approach', *International Journal of Economics and Financial Issues*, vol.10, no.3, pp. 217–224.

Younus, S 2012, 'Relative Effectiveness of Monetary and Fiscal Policies on Output Growth in Bangladesh: A Co-integration and Vector Error Correction Approach, pp.0-17.

Copyright of Journal of Developing Areas is the property of Tennessee State University, College of Business and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.