AIUB Journal of Business and Economics [AJBE]

Volume 20, Issue 2, December 2023 Pages 52-66

Research Article

ISSN: 1683-8742 (PRINT) 2706-7076 (ONLINE) Homepage: https://ajbe.aiub.edu

Monetary Policy Efficacy for Price Stability: An In-depth Analysis of Bangladesh's Economic Landscape

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Abstract

Purpose of the study: This study aims is to examine the effectiveness of monetary policy on price stability in Bangladesh.

Methodology: The researcher has collected secondary data from the audited annual reports of the Bangladesh bank from 2014 to 2022. The inflation rate selected as the dependent variable, and the exchange rate, real interest rate, cash reserve ratio, and repo rate selected as the independent variables. The study used regression analysis to find out the relationship between dependent and independent variables, which is supported by the results of normality tests, multicollinearity tests, and autocorrelation tests.

Findings: The study found that there was a statistically significant relationship between the dependent variable inflation rate and the independent variables cash reserve ratio and repo rate. On the other hand, there was no significant relationship between the dependent variable's inflation rate and the independent variables' exchange rate and real interest rate. The relationship between the inflation rate and the exchange rate was almost significant. Therefore, the study found that monetary policy has a significant impact on price stability in Bangladesh.

Implications: The finding of the present study has been found to have implications for policy makers, regulators, professional, practitioners, researchers, economists etc. in the money market of Bangladesh.

Limitations and Future direction: This study has covered the operating of monetary policy for 9 years from 2014 to 2022 though I could consider since 1971. In addition, the study has considered only Bangladesh Bank and listed conventional private commercial banks. The study has not addressed application of monetary policy in NBFIs and capital market.

Article History:
Received: 14th October 2023
Accepted: 29th Dec 2023
Online: 30th December 2023

Keywords:
Effectiveness; Monetary Policy; Price Stability; Bangladesh

1.0 Introduction

This study aims at examining the effectiveness of the monetary policy on price stability in Bangladesh. Price stability is an important goal of the monetary policy of the central bank of Bangladesh. The Bangladesh Bank seeks to achieve price stability by applying various monetary policy instruments. Price stability in an economy refers to the fact that the general level of prices does not change significantly over time. In other words, there is no considerable increase or decrease in the value of money; there is no significant inflation or deflation. Price stability can be achieved through the efficient use of the monetary policy. According to Babatunde and Kehinde (2016), price volatility is a symptom of rising inflation; it threatens the nation's ability to advance economically in the long run. Although price stability is often difficult to achieve, at least in the short run, it is often necessary because it appears to conflict with other macroeconomic objectives. A consequence of this is that monetary management includes some trade-offs with other national economic policy objectives. Financial stability is defined as a scenario in which the financial system can guarantee the optimal allocation of funds to investment opportunities while also being able to withstand shocks without substantial disruptions. From this viewpoint, improved complementarity between pricing and financial stability is linked to economic globalization and, in particular, the removal of obstacles to the free flow of money (Bandoi, Berceanu, and Danciulescu, 2009).

It is evident from the review of literature published in Bangladesh and outside Bangladesh that the findings of the study across literature are found to be inconsistent. The researches conducted on the impact of monetary policy are found to be not comprehensive. Besides, the research conducted on the impact of monetary policy in Bangladesh is not adequate, and the findings of these papers are inconsistent too. The Bangladesh Bank faces many challenges in the implementation of monetary policy: inflationary pressure, low investment scenario, unexpected financial instability, linking monetary policy to the target and objective, etc. The scope of most of the existing studies is limited to identify the effectiveness of monetary policy in ensuring price stability in Bangladesh but still have many opportunities for improvement. These issues have been left unaddressed as of today. In view of this, the present study has been undertaken to evaluate the impact of monetary policy on the economic development in Bangladesh.

1.1 Objective of the Study

The main objective of this study is to examine the effectiveness of monetary policy on price stability in Bangladesh. To accomplish the main objective, the following specific objectives have been addressed:

a) To identify the variables relating to the effectiveness of monetary policy on price stability.

b) To articulate the features of monetary policy variables and price stability.

c) To determine the relationship between monetary policy and price stability.

1.2 Theoretical Framework and Research Hypothesis

The study's theoretical framework was developed through a survey of the literature, content analysis, and consultation with specialists. Keynes' theory of monetary policy was followed by the researcher: the investment multiplier, the marginal efficiency of capital, and the interest rate (Dickens, 2011), the Taylor Rule of interest rate forecasting monetary policy model (Caglayan and Astar, 2010), and the Monetarist Quantity Theory of Money (Kaldor, 1970). The theoretical frameworks are as follows:

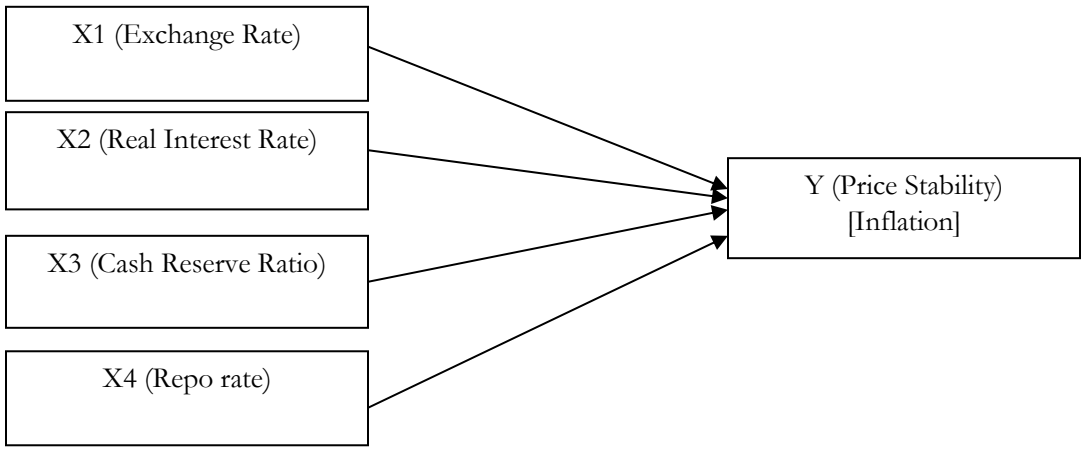

Figure 1: Relationship between Monetary Policy and Price Stability

Principal Hypotheses:

The following hypothesis has been taken for testing:

Ho: Monetary policy does not have significant relationship with the price stability in Bangladesh.

H1: Monetary policy has a significant relationship with the price stability in Bangladesh.

Specific Hypothesis:

Ho: $\beta 1, \beta 2, \beta 3$ or $\beta 4 = 0$

H1: $\beta 1, \beta 2, \beta 3$ or $\beta 4 \neq 0$

2.0 Review of Literatures

Rivel and Yirong (2020) have investigated of the influence of monetary policy on the overall level of prices in the Democratic Republic of the Congo for the period 2000-2016. Considering the examination and interpretation of the findings obtained via the use of the linear regression technique that has been used, researchers find that our hypotheses have been verified. Researchers began with the premise that the central bank of the Democratic Republic of the Congo's monetary policy has an inefficient impact on the general price level; the results of the calculations carried out using the SPSS software display that the monetary policy of the central bank of Congo has a negative effect on the general price level, with the monetary policy of the Congo's central bank accounting for 83 percent of the cover of the general price level explained by the bad monetary policy of the Congo's central bank.

Chukwuemeka (2018) has studied at Nigeria's monetary policies and price stability. The study has used annual data from 1981 to 2015. The Augmented Dickey-Fuller test technique was used to perform a unit root test, which revealed that the variables were stationary at various levels. The Johanssen co-integration approach was also used to perform a co-integration test, which demonstrated that the variables in the model are co-integrated, meaning that they have a long-term link. The supply of money and liquidity ratio do have considerable influence on price stability, according to the model, which was calculated using the ordinary least square approach. Changes in the explanatory variables account for 96.27 percent of the overall variance in the model, according to the findings. Based on these results, the paper suggests that the central bank implement proper monetary

policy by cutting money supply and boosting the liquidity ratio, both of which would result in a decrease in the consumer price index.

Itodo (2017) has explored the role of monetary policy in regulating the Nigerian price level. To capture this link, the researcher applies the Var Model (VAR) model, which has a built-in difference method to account for the unit root in this time series data. The research establishes that there is no substantial association between money supply and price levels in Nigeria. This might be a result of the enormous informal financial sector's influence, which controls a significant portion of money in circulation. Thus, policy measures aimed at reducing the informal financial sector's impact should be enacted to improve the central monetary authority's performance and the function of monetary management in Nigeria.

Babatunde and Kehinde (2016) have examined the influence of monetary policy on Nigeria's price stability between 1970 and 2014. The information gathered for the purpose of the inquiry was broken down using the conventional least square relapse (OLS) model, the unit root test, and the Johansen co-reconciliation test. The Consumer Price Index (CPI) is used as a proxy for the overall level of cost, which is the explanatory variable. As informative elements, the conversion scale and cash were used. Additionally, the investigation focused on a variety of fiscal difficulties, including expenditure shortages, strategy definition changes, the lack of enabling circumstances in the money market, and political uncertainty. The data indicates that both trade size and cash have had a substantial influence on value security in Nigeria, both in the short term and over time. This is demonstrated by a 90% assurance coefficient and F-measurements of 168.30, which are significantly higher than the conventional F-Statistics.

Bassey and Akpan (2016) have used time series data to analyze the impact of monetary policy on price stability in Nigeria from 1970 to 2014. The study's theoretical framework is monetarist, and it uses OLS regression to demonstrate the empirical link between the variables. The unit root and co-integration tests demonstrated stationarity and long-run relationships for all variables, appropriate for OLS estimation. The model's empirical findings reveal a positive link between money supply, the monetary policy rate, and private sector lending as a proportion of GDP in Nigeria. The research also indicates considerable money supply expansion, indicating that inflation in Nigeria is monetary.

Adegboye (2013) has studied the effectiveness of monetary policy approach to price stability in Nigeria are empirically examined. Quarterly time series data for 1981 to 2009 period are used and various econometric tools, including error correction modeling (ECM) and Granger Causality testing, are employed to carry out the empirical analysis. Moreover, price 'instability' is measured using four quarter standard deviations of the consumer price index. Traditionally, it is believed that monetary policy contributes effectively towards the achievement of macroeconomic objectives, through manipulation of critical variables in the financial system aimed at changing the growth of money supply as well as the direction of credit. However, the result of our research findings showed that the role of monetary policy in achieving the objective of price stability has been less than successful in Nigeria, especially in the long run. Moreover, there does not seem to be a synergy among the various monetary policy tools in achieving price stability in Nigeria.

Bandoi, Berceanu, and Danciulescu (2009) have evaluated several elements of the link between price stability and financial stability in the present economic climate. It is agreed that the Euro system's monetary policy continues to have as its primary goal price stability, which is one of the most essential strategies for promoting long-term economic development. Despite the fact that there are several theoretical approaches to the price stability notion, they all converge on the idea of assessing and controlling perpetual inflation. Financial stability may be described as a condition in which there are no banking crises and there is a certain amount of asset price stability, including interest rates.

Coenen, Orphanides, and Wieland (2004) have examined price stability and the efficacy of monetary policy when nominal interest rates are fixed at zero. It concludes that if the economy is reliant on stochastic shocks comparable to those experienced in the 1980s and 1990s in the United States, the zero headed findings are irrelevant for goal expansion rates as low as 2%. Nonetheless, the limitation's effects on the growth aim are indirect and result in a quantitatively significant weakening of the economy's exhibition with foci between 0% and 1%. The inconstancy of yield increases significantly, as does the inconstancy of swelling. Additionally, the

research demonstrates that the asymmetry of the approach insufficiency induced by the zero bound results in a non-vertical run Phillips bend. Yield underperforms in terms of potential with smaller growth ambitions.

Svensson (2001) has examined how to define price stability and how to sustain it in reality. Additionally, it discusses specific workouts for the Euro system. Value strength is determined by establishing price level stability and low (counting zero) inflation, selecting the most closely fitting value record, and selecting the appropriate level for a quantitative target. Additionally, it entails determining the role of actual components, such as yield, in fiscal approach aims. In this vein, defining value soundness boils down to defining how money-related strategic misfortune works. This study argues that figure concentrating is likely to be the most effective approach for preserving value strength, since it is the most efficient and adaptive means of using available data in light of transmission system flaws and susceptibility. By aggregating estimate focusing from mean gauge focusing to dissemination hypothesis focusing, it should also be the optimal strategy for addressing model vulnerability. Without a doubt, he recognized that the present best practice in maintaining national banks' value strength must be seen as figure focused on.

Svensson (2000) has explored a number of concerns about how monetary policy should be conducted in a period of price stability using the price-level targeting formula. Three distinct approaches to maintaining value security are examined: (1) a commitment to a simple instrument rule, (2) "gauge concentrating on," and (3) financial focusing on. Both (1) and (3) are seen as inadequate in comparison to the hypothesis centered on maintaining value solidity. Believability increases the trade-off between expansion changeability, yield volatility, and instrument volatility, making it easier for the central bank to fulfill its expansion target. The risk of emptying and the existence of a liquidity trap are examined. Simple inflation targeting and an alternative course of action with crisis measures, including a planned financial and monetary extension, are unlikely to dodge a liquidity trap, but will aide in escaping one if captured.

Woodford (1999) has explored the definition of price stability and how it may be maintained in reality. Additionally, several lessons for the Euro system are examined. The definition of price stability, the trade-off between price stability and low inflation, as well as the choice of the price index, the quantitative target, and the function of output stabilization, are all explored. Regarding price stability, three major possibilities are considered: adherence to a basic instrument rule (such as the Taylor rule), forecast targeting (such as inflation-forecast targeting), and intermediate targeting (like money-growth targeting). A basic instrument rule is insufficient to replace a systematic framework for monetary policy decision-making. Rather than that, forecast targeting provides such a framework. Forecasting may integrate judgmental modifications, extra-model data, and a variety of other indications. By expanding mean forecast targeting to distribution forecast targeting; it is possible to integrate nonlinearity, nonadditive uncertainty, and model uncertainty. The Euro system's arguments in support of its money-growth indicator and against forecast-based inflation targeting are examined and found to be unpersuasive.

Johnson, Small, and Tryon (1999) have examined the difficulties associated with implementing monetary policy in the context of sustained price stability. The researchers have discussed several issues concerning the choice of a central bank's inflation objective: the importance of price measurement in articulating monetary policy objectives under sustained low inflation, the behavior of many other key nominal variables, especially wages, when price increases are always on average close to zero, and the possibility of additional channels through which conditions of really low inflation alter relationships within the economy. The researchers summarize the findings of Federal Reserve research designed to shed light on these issues for the United States and take into account the accessibility and effectiveness of different policy tools when the nominal interest rate is near zero.

Zayed (2018) has evaluated Bangladesh's monetary policy in terms of bank rate, inflation rate, and output gap from 1972 to 2016 using Taylor's rule. The ADF, PP, KPSS, OLS, GMM, CUSUM, and CUSUMQ tests were used to examine the association between the variables and the stability of the linear regression. It discovered that there was a link between the variables and that Taylor's rule did not apply throughout the time period investigated. The Bangladesh Bank has to adopt a conservative monetary policy using the bank rate as the primary policy instrument, in order to reduce both the production gap and the inflation rate while sustaining the Bangladesh economy's money supply.

Hossain (2010) has examined Bangladesh's monetary targeting for price stability, the stability of the country's money demand function, and the relationship between money supply increase and inflation. As such, it examined the behavior of broad cash requests within a cointegration and error correction demonstration system, as well as whether there is a causal relationship between cash requesting development and growth. The observational findings suggest that from the mid-2000s, an open-economy-wide cash demand work has been consistent in Bangladesh. Additionally, the experimental results suggest the existence of a causal relationship between cash flexibility development and swelling. On the basis of these findings, it is reasonable to conclude that Bangladesh's concentration on money remains appropriate.

Abdullah, Parvez, and Tooheen (2012) have stated that monetary policy has an influence on inflation in Bangladesh. The study mostly utilized the Consumer Price Index to estimate inflation in Bangladesh from 2000 to 2012. The study established a correlation between monetary policy and inflation, as well as the drawbacks and potential solutions, which include decoupling monetary policy from fiscal policy and increasing the transparency, communication, and signaling effect of policy moves, maintaining broad money in line with estimated real GDP growth, borrowing from non-bank sources, and controlling money supply through various open market operations. Due to a lack of appropriate data, we must rely on hypotheses and models for part of our work. As a result, certain data may differ depending on the model utilized. Finally, although several studies have been conducted from the viewpoint of developed and developing nations, little research has been conducted on the link between monetary policy and inflation in Bangladesh.

2.1 Identification of Variables Relating to the Effectiveness of Monetary Policy on Price Stability for Model Specification on Review of Literature and Content Analysis

Many researchers have researched to measure the effectiveness of the monetary policy on price stability (Rivel & Yirong, 2020; Soni, 2019; Nwamuo, 2018; Bassey & Akpan, 2016; Babatunde & Kehinde, 2016; Onderi & Njuru, 2015; Kapounek & Lacina, 2014; Hossain, 2010; Bordes, & Clerc, 2007; Johnson, Small & Tryon, 1999). Many different monetary policy variables were studied to determine whether there is a positive or negative relationship between monetary policy and price stability. In table 1, the researcher has compiled the results and findings from previous literature searches.

Table 1: Identification of Variable and Development of Model for Testing the Effectiveness of Monetary Policy on Price Stability

Variables		Research Study									
		Rivel & Yirong (2020)	Soni (2019)	Nwamuo (2018)	Bassey & Akpan (2016)	Babatunde and Kehinde (2016	Onderi & Njuru (2015)	Kapounek & Lacina (2014)	Hossain. (2010)	Bordes, & Clerc (2007)	Johnson, Small & Tryon (1999)
Dependent Variables	Consumer Price Index (CPI) / Inflation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Independent Variables	Interest Rate		✓			✓			✓	✓	✓
	Money Supply	✓		✓	✓	✓	✓	✓	✓	✓	
	Cash Reserve Ratio (CRR)			✓							
	Exchange Rate	✓	✓		✓	✓	✓		✓		✓
	Monetary Policy Rate				✓						
	Credit to Private Sector		✓		✓	✓					
	Repo Rate		✓								
	GDP Growth	✓					✓				✓

Model Used	The Linear Regression Model/ OLS Model	✓		✓	✓	✓				✓	
	SVAR Model		✓				✓				
	Co-integration Model			✓		✓			✓		
	SARIMA Model							✓			
	Taylor Rules										✓

3.0 Methodology of the Study:

The study is based on secondary data, which spanned nine years from 2014 to 2022, and sought to determine the impact of monetary policy on price stability. The secondary data is gathered from the audited annual reports of the Bangladesh bank. The data were collected, tabulated, categorized, and organized, and the necessary calculations for the compilation of time series data were used to accomplish the goal. The linear regression model has been used to test the hypothesis. Descriptive analysis, autocorrelation, multicollinearity test, and normality test are used for the study. The inflation rate has selected as the dependent variable, and the exchange rate, real interest rate, cash reserve ratio, and repo rate were used as the independent variables.

Regression equations are as follows:

$INFR = \beta_0 + \beta_1 ER + \beta_2 RIR + \beta_3 CRR + \beta_4 RR + \mu$

Where:

INFR= Inflation Rate; ER= Exchange Rate; RIR= Real Interest Rate; CRR= Cash Reserve Ratio; RR= Repo Rate; β_0 = Intercept of relationship in the model/constant; β_1, β_2, β_3, β_4, = Coefficients of each independent or explanatory variable; μ = Error term

4.0 Descriptive Features of Monetary Policy Variables and Price Stability

The study has used descriptive statistics to articulate the feature of the variables used in the linear regression model is shown in the following table.

Table-2: Descriptive Features of Monetary Policy Variables and Price Stability

Variables	Min	Max	Range	Mean	Std. Dev.
INFR	5.40	8.80	3.40	6.74	1.30
ER	71.20	84.00	12.80	78.79	3.53
RIR	3.07	6.89	3.82	4.89	1.24
CRR	5.50	6.50	1.00	6.11	0.42
RR	6.00	7.75	1.75	6.92	0.60

Sources: Output derived from applying Stata (Version-15)

Notes: Data have been compiled by the Researcher

(INFR= Inflation Rate, ER= Exchange Rate, RIR= Real Interest Rate, CRR= Cash Reserve Ratio, RR= Repo Rate)

It has been observed from Table 2 that the expected inflation rate during nine years from 2014 to 2022 understudy is 6.74% and which has varied at the rate of 1.30% in actual rate from the expected rate. During this period, INFR has gone lowest to 5.40% and highest to 8.80%, producing a range of 3.40%. The expected exchange rate during nine years from 2014 to 2022 understudy is 78.79, which has varied at the rate of 3.53%

in actual rate from the expected rate. During this period, ER has gone lowest to 71.20 and highest to 84.00, thereby producing a range of 12.8. The expected real interest rate during nine years from 2014 to 2022 understudy is 4.89%, which has varied at the rate of 1.24% in actual rate from the expected rate. During this period, RIR has gone lowest to 3.07% and highest to 6.89%, producing a range of 3.82%. The expected cash reserve ratio during nine years from 2014 to 2022 understudy is 6.11%, which has varied at the rate of 0.42% in actual rate from the expected rate. During this period, CRR has gone lowest to 6.50% and Highest to 6.50%, producing a range of 1.00%. The expected repo rate during nine years from 2014 to 2022 understudy is 6.92%, which has varied at the rate of 0.60% in actual rate from the expected rate. During this period, RR has gone lowest to 6% and highest to 7.75%, thereby producing a range of 1.75%.

4.1 Analysis of Bi-variate Relationship between Variables on Zero Order Correlation Matrix

The study has used a zero-order correlation matrix to find out the relationship between the variables. The researcher has applied five variables: inflation rate as dependent variable and exchange rate, real interest rate, cash reserve ratio, and repo rate as independent variables from 2014 to 2022. The output is shown in the following zero-order correlation matrix.

Table 3: Analysis of Bi-variate Relationship between Variables on Zero Order Correlation Matrix

	INFR	**ER**	**RIR**	**CRR**	**RR**
INFR	1				
ER	-.677*	1			
RIR	.546	-.176	1		
CRR	.036	-.462	.050*	1	
RR	.770****	-.615****	.536	.542	1
***. Correlation is significant at the 0.05 level.**					
****. Correlation is significant at the 0.10 level.**					

Sources: Output derived from applying SPSS (Version-23
Notes: Data have been Compiled by the Researcher

(INFR= Inflation Rate, ER= Exchange Rate, RIR= Real Interest Rate, CRR= Cash Reserve Ratio, RR= Repo Rate)

It has been found from the examination of Table 3 that there is a significant negative relationship between the inflation rate and the exchange rate with an r-value of -0.677 at the 5% level of significance. There is a significant positive relationship between the inflation rate and the repo rate with an r-value of 0.770 at a 5% level of significance. There is a significant positive relationship between the real interest rate and the cash reserve ratio with an r-value of.050 at a 5% level of significance. There is a significant negative relationship between the exchange rate and the repo rate with an r-value of -.615 at the 10% level of significance.

4.2 Test of Assumptions

For this study, researcher has used the following assumptions based on the literature review and content analysis: normality tests, multicollinearity tests, and autocorrelation tests are used to measure the suitability of data and the fitness of the model.

Normality Test:

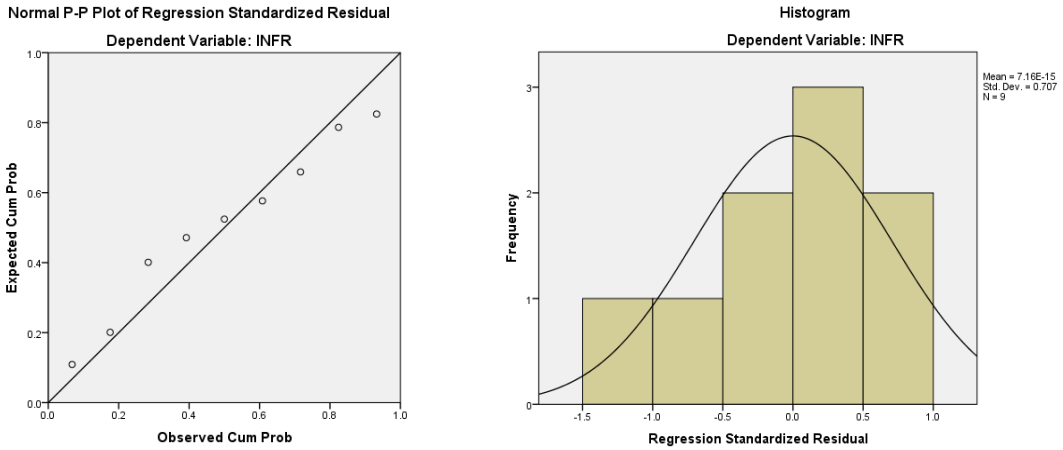

Figure 2: Normality Test of Dependent Variable-INFR

According to Frost, a normal distribution is a continuous probability distribution that is symmetrical around its mean, in which most observations cluster around the central peak and in which the probabilities for values further away from the mean taper off equally in both directions as one moves away from the mean. Extreme values in both the left and right tails of the distribution are also rare. The researcher determined that the data are normally distributed based on the PP plots and histograms shown above.

Multicollinearity Test:

Table 4: Multicollinearity Test among Independent Variables

Independent Variables	Collinearity Statistics	
	Tolerance	VIF
ER	.580	1.725
RIR	.612	1.635
CRR	.615	1.626
RR	.340	2.944

Sources: Output Derived from Applying SPSS (Version-23)
Notes: Data have been Compiled by the Researcher

Multicollinearity is the occurrence of substantial intercorrelations between two or more independent variables in a multiple regression model. It is defined as follows: The presence of Multicollinearity can result in skewed or misleading results when a researcher or analyst attempts to determine how well each independent variable can be used to predict or understand the dependent variable in a statistical model by examining the relationship between the independent variables (Hayes, 2021). In the literature about Multicollinearity, various guidelines have been provided for appropriate levels of VIF. Most often, the maximum level of VIF means a value that is 10 (Hair et al. 1995; Kennedy, 1992; Marquardt, 1970). The recommendation of a VIF of 10 corresponds to the tolerance of .10. However, in the other literature, a suggested maximum VIF value is 5 (Rogerson, 2001), and even 4 (Pan & Jackson, 2008) can be found. The researcher found the VIF value for the entire variable is less than 2, except for one variable that is 2.944, greater than 2. The tolerance level is statistically significant of all the variables except one variable for one stated before. Therefore, Multicollinearity was not problematic.

Auto-Correlation Test:

Table 5: Auto-Correlation Test

	Durbin-Watson
Dependent Variable: INFR	2.328
Predictors: (Constant), ER, RIR, CRR, RR	

Sources: Output Derived from Applying SPSS (Version-23)

Notes: Data have been Compiled by the Researcher

Durbin Watson value can be between 0 to 4. Durbin Watson is close to 0, meaning that strong positive correlation and if the value is close to 4, meaning that there is strong negative correlation. Durbin Watson value is close to 2, meaning that there is no serial correlation. As a conservative rule (Field, 2000), Durbin Watson values of less than 1 or greater than 3 should pose a problem. The researcher has discovered a Durbin-Watson value of 2.328, which close to 2, meaning that there is no serial correlation in the model.

5.0 Analysis of Effectiveness of Monetary Policy on Price Stability

The study has examined the impact of monetary policy on price stability in Bangladesh. The researcher has selected the inflation rate as the dependent variable and the exchange rate, real interest rate, cash reserve ratio and repo rate as the independent variables. The study has used OLS Regression Model to find out the relationship between dependent and independent variables, which is supported by the results of normality tests, multicollinearity tests, and autocorrelation tests.

Table 6: Effectiveness of Monetary Policy on Price Stability

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	20.035	7.544		2.656	.057
ER	-.174	.065	-.472	-2.685	.055
RIR	.092	.180	.088	.512	.636
CRR	-1.865	.533	-.597	-3.497	.025
RR	1.643	.499	.757	3.295	.030

	Sum of Squares	df	Mean Square	Calculated Value of F	Table Value of F	Sig.
Regression	12.591	4	3.148	12.957	3.84	.015[b]
Residual	.972	4	.243			
Total	13.562	8				

r^2	0.928
Adjusted r^2	0.857
a. Dependent Variable: INFR	
b. Predictors: (Constant), RR, RIR, CRR, ER	

Sources: Output derived from applying SPSS (Version-23)
Notes: Data have been Compiled by the Researcher

It is evident from Table 6 that the value of r^2 is 0.928. It indicates that 92.8% of the fluctuation in the inflation rate can be explained by the exchange rate, real interest rate, cash reserve ratio, and repo rate jointly, and the remaining 7.2% of the fluctuation in the inflation rate can be explained by other variables which are not included in this model. The r^2 ranges between 0 and 1; the closer it is to 1, the better the fit (Gujarati, Porter, & Gunasekar, 2012). If the r^2 value is greater than 60%, the model is normally well fitted (Ozili, Peterson, 2016). According to Henseler (2009), r^2 values of 0.75, 0.50, and 0.25 are interpreted as considerable, moderate, and weak, respectively. The study has found the value of r^2 is 0.928, which means that the data in the model is accurately fitted. The study has also found that the value of adjusted r^2 is 0.857, which indicates the extent to

which a collection of predictor variables can explain the variance in the dependent variables, adjusting for the number of variables in a model.

The null hypothesis is that the exchange rate, real interest rate, cash reserve ratio, and repo rate do not influence the inflation rate. The alternative hypothesis is that the exchange rate, real interest rate, cash reserve ratio, and repo rate jointly influence the inflation rate. It checks from F statistics that it is 12.957, and the corresponding probability is 1.50%. The calculated F value in the model is 12.957, which is more than the tabulated F value of 3.84, and the probability value is 1.50%, which is less than 5% (Glen, 2013). From the F test and P-value outcomes, the study can reject the null hypothesis and accept the alternative hypothesis, meaning that the exchange rate, real interest rate, cash reserve ratio, and repo rate jointly influence the dependent variable, which is the inflation rate.

The variable exchange rate is not significant because the probability value is 5.50%. Normally, when the probability value is less than 5%, that particular variable is significant, but if the probability value is more than 5%, then that variable is not significant. So here, the probability value is 5.50%, which means that the exchange rate is not a significant variable to explain the inflation rate. The exchange rate coefficient is -.174, which means that the association between the exchange rate and inflation rate is negative. The p-value of the real interest rate is 63.6%, which is more than 5%. It indicates that the real interest rate is not a significant variable explaining the inflation rate. The coefficient of the real interest rate is 0.092, which means that the association between the real interest rate and the inflation rate is positive. The P-value of the cash reserve ratio is 2.5%, which indicates that the cash reserve ratio is a significant variable in explaining the inflation rate because the p-value is less than 5%. The coefficient of the cash reserve ratio is -1.865, which means that the association between the cash reserve ratio and the inflation rate is negative. The P-value of the repo rate is 3%, which indicates that the repo rate is a significant variable to explain the inflation rate because the p-value is less than 5%. The coefficient of the repo rate is 1.643, which means that the association between the repo rate and the inflation rate is positive. The study has identified a statistically significant relationship between the dependent variable inflation rate and the independent variables cash reserve ratio and repo rate. On the other hand, there is no significant relationship between the dependent variable's inflation rate and the independent variables' exchange rate and real interest rate. The relationship between the inflation rate and the exchange rate is almost significant. However, it is higher than 0.05, but it is nearly close to 0.05. The researcher stated a significant relationship between monetary policy and price stability. The overall hypothesis testing result said that the null hypothesis is rejected and the alternative hypothesis is accepted.

In their research paper, Babatunde and Kehinde (2016) have used independent variables such as money supply, interest rate, debt financing, economic reform, exchange rate, and the dependent variable, consumer price index. The model used the ordinary least square of multiple regression statistical technique and found a relationship between the exchange rate and money supply in the short and long run. Another study about the impact of monetary policy on price stability also used the ordinary least square multiple regression statistical technique to determine the relationship between variables; they used money supply, exchange rate, and interest rate as independent variables. Inflation was used as the dependent variable. They found a significant relationship between the exchange rate and the level of inflation (Mayo et al., 2020). Brahmachary (2019) uses CRR, repo, reverse repo rate, and inflation in the study about the monetary policy's effectiveness on India's price stability. They used multiple regression and ANOVA analysis and found a significant relationship between monetary policy (repo and reverse repo rate) and price stability.

6.0 Summary of the Findings

The study has found that the expected inflation rate during nine years from 2014 to 2022 understudy is 6.74%, which has varied at the rate of 1.30% in actual rate from the expected rate. During this period, INFR has gone lowest to 5.40% and highest to 8.80%, producing a range of 3.40%. The expected exchange rate during nine years from 2014 to 2022 understudy is 78.79, which has varied at the rate of 3.53% in actual rate from the expected rate. During this period, ER has gone lowest to 71.20 and highest to 84.00, thereby producing a range of 12.8. The expected real interest rate during nine years from 2014 to 2022 understudy is 4.89%, which has varied at the rate of 1.24% in actual rate from the expected rate. During this period, RIR has gone lowest to 3.07% and highest to 6.89%, producing a range of 3.82%. The expected cash reserve ratio during nine years from 2014 to 2022 understudy is 6.11%, which has varied at the rate of 0.42% in actual rate from the expected rate. During this period, CRR has gone lowest to 6.50% and Highest to 6.50%, producing a range of 1.00%. The expected repo rate during nine years from 2014 to 2022 understudy is 6.92%, which has varied at the rate of 0.60% in actual rate from the expected rate. During this period, RR has gone lowest to 6% and highest to 7.75%, thereby producing a range of 1.75%.

The study has examined the impact of monetary policy on price stability in Bangladesh. The researcher has selected the inflation rate as the dependent variable and the exchange rate, real interest rate, cash reserve ratio and repo rate as the independent variables. The study has used regression analysis to find out the relationship between dependent and independent variables, which is supported by the results of normality tests, multicollinearity tests, and autocorrelation tests. The researcher has found that the value of r^2 is 0.928. It indicates that 92.8% of the fluctuation in the inflation rate can be explained by the exchange rate, real interest rate, cash reserve ratio, and repo rate jointly, and the remaining 7.2% of the fluctuation in the inflation rate can be explained by other variables which are not included in this model. The r^2 ranges between 0 and 1; the closer it is to 1, the better the fit (Gujarati, Porter, & Gunasekar, 2012). If the r^2 value is greater than 60%, the model is normally well fitted (Ozili, Peterson, 2016). According to Henseler (2009), r^2 values of 0.75, 0.50, and 0.25 are interpreted as considerable, moderate, and weak, respectively. The study has found the value of r^2 is 0.928, which means that the data in the model is accurately fitted. The study has also found that the value of adjusted r^2 is 0.857, which indicates the extent to which a collection of predictor variables can explain the variance in the dependent variables, adjusting for the number of variables in a model. The null hypothesis is that the exchange rate, real interest rate, cash reserve ratio, and repo rate do not influence the inflation rate. The alternative hypothesis is that the exchange rate, real interest rate, cash reserve ratio, and repo rate jointly influence the inflation rate. It checks from F statistics that it is 12.957, and the corresponding probability is 1.50%. The calculated F value in the model is 12.957, which is more than the tabulated F value of 3.84, and the probability value is 1.50%, which is less than 5% (Glen, 2013). From the F test and P-value outcomes, the study can reject the null hypothesis and accept the alternative hypothesis, meaning that the exchange rate, real interest rate, cash reserve ratio, and repo rate jointly influence the dependent variable, which is the inflation rate.

The study has also found that the variable exchange rate is not significant because the probability value is 5.50%. Normally, when the probability value is less than 5%, that particular variable is significant, but if the probability value is more than 5%, then that variable is not significant. So here, the probability value is 5.50%, which means that the exchange rate is not a significant variable to explain the inflation rate. The exchange rate coefficient is -.174, which means that the association between the exchange rate and inflation rate is negative. The p-value of the real interest rate is 63.6%, which is more than 5%. It indicates that the real interest rate is not a significant variable explaining the inflation rate. The coefficient of the real interest rate is 0.092, which means that the association between the real interest rate and the inflation rate is positive. The P-value of the cash reserve ratio is 2.5%, which indicates that the cash reserve ratio is a significant variable in explaining the inflation rate because the p-value is less than 5%. The coefficient of the cash reserve ratio is -1.865, which means that the association between the cash reserve ratio and the inflation rate is negative. The P-value of the repo rate is 3%, which indicates that the repo rate is a significant variable to explain the inflation rate because the p-value is less than 5%. The coefficient of the repo rate is 1.643, which means that the association between the repo rate and the inflation rate is positive. The study has identified that there is a statistically significant relationship between the dependent variable inflation rate and the independent variables cash reserve ratio and repo rate. On the other hand, there is no significant relationship between the dependent variable's inflation rate and the independent variables' exchange rate and real interest rate. The relationship between the inflation rate and the exchange rate

is almost significant. However, it is higher than 0.05, but it is nearly close to 0.05. The researcher stated a significant relationship between monetary policy and price stability. The overall hypothesis testing result said that the null hypothesis is rejected and the alternative hypothesis is accepted. Therefore, the study has found that monetary policy has a significant impact on price stability in Bangladesh.

References

Abdullah, M. N., Parvez, K., & Tooheen, R. B. (2012). Impacts of monetary policy on inflation in Bangladesh. Global Disclosure of Economics and Business, 1(2), 103-119.

Adegboye, A. C. (2013). A dynamic analysis of monetary policy and price stability in Nigeria. Published by Department of Economics, Adeyemi College of Education, Ondo, 1-18.

Alsaeed, K. (2006). The association between firm-specific characteristics and disclosure: The case of Saudi Arabia. Managerial Auditing Journal, 21(5), 476-496.

Babatunde, A. A., & Kehinde, I. V. (2016). The impact of monetary policy on price stability in Nigeria. Global Journal of Economics and Business Administration, 1(2), 14-26.

Bandoi, A., Berceanu, D., & Danciulescu, D. (2009). Price stability and financial stability in the context of EUROSYSTAM's monetary policy. European Research Studies, 12(4).

Bassey, G. E., & Akpan, P. E. (2016). The effect of monetary policy on price stability in Nigeria (1970–2014). International Journal of Social Sciences, 10(4), 1-16.

Bordes, C., & Clerc, L. (2007). Price Stability and the ECB'S monetary policy strategy. Journal of Economic Surveys, 21(2), 268-326.

Brahmachary, A. (2019). Impact of Monetary Policy on Indian Economic Growth and Price Stability in the 21st Century: An Exploratory Study. In The Impacts of Monetary Policy in the 21st Century: Perspectives from Emerging Economies. 351–360, Emerald Publishing Limited.

Çağlayan, E., & Astar, M. (2010). Taylor rule: Is it an applicable guide for inflation targeting countries. Journal of Money Investment and Banking, 18, 55-67.

Chukwuemeka, N. (2018). Monetary policy and price stability in Nigeria (1981-2015). Journal of Economics and Sustainable Development, 9(10), 52-57.

Coenen, G., Orphanides, A., & Wieland, V. (2004). Price stability and monetary policy effectiveness when nominal interest rates are bounded at zero. Advances in Macroeconomics, 4(1).

Dickens, E. (2011). Keynes's Theory of Monetary Policy: An Essay in Historical Reconstruction. Contributions to Political Economy, Oxford University Press, vol. 30(1), pages 1-11.

Frost, J., (2022). Normal distribution in statistics. Statistics by Jim. Retrieved February 8, 2022, from https://statisticsbyjim.com/basics/normal-distribution/

Glen, S. (2013). F statistic/F value: Simple definition and interpretation. Retrieved January, 20, 2018.

Gujarati, D. N., Porter, D. C., & Gunasekar, S. (2012). Basic econometrics. Tata mcgraw-hill education.

Hair, J. F. Jr., Anderson, R. E., Tatham, R. L. and Black, W. C. (1995). Multivariate Data Analysis (3rd edition). New York: Macmillan.

Hayes, A. (2021). Multicollinearity.https://www.investopedia.com/terms/m/multicollinearity.asp

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. In New challenges to international marketing. Emerald Group Publishing Limited, Bingley, pp. 277-319.

Hossain, A. A. (2010). Monetary targeting for price stability in Bangladesh: How stable is its money demand function and the linkage between money supply growth and inflation? Journal of Asian Economics, 21(6), 564-578.

Itodo, I. A., Akadiri, S. S., & Ekundayo, R. M. (2017). Monetary policy and price stability in Nigeria. Academic Journal of Economic Studies, 3(2), 68-75.

Johnson, K., Small, D. H., & Tryon, R. W. (1999). Monetary policy and price stability. International Finance Working Paper, (641).

Kaldor, N. (1970): The new monetarism, in: Lloyds Bank Review, 97(1), 18.

Kapounek, S., & Lacina, L. (2007). Money supply growth and inflation-the monetary policy strategy of the European central bank. Rocnik LV, 4(3), 57-66.

Kennedy, P. (1992). Violating assumption five: Multicollinearity. Guide to econometrics, 192-202.

Marquardt, Donald W., and Ronald D. Snee. "Ridge regression in practice." The American Statistician 29, no. 1 (1975): 3-20.

Onderi, V. N., & Njuru, S. G. (2015). The impact of monetary policy on economic growth and price stability in Kenya: 1992–2013. IOSR Journal of Economics & Finance, 6(6), 95-109.

Ozili, Peterson. (2016). Re: What is the acceptable r-squared value?. Retrieved from: https://www.researchgate.net/post/what_is_the_acceptable_r-squared_value/57cfcb0d3d7f4be2fb47f515/citation/download.

Pan, Y., & Jackson, R. T. (2008). Ethnic difference in the relationship between acute inflammation and serum ferritin in US adult males. Epidemiology & Infection, 136(3), 421-431.

Rivel, B. P. D., & Yirong, Y. (2020). The effect of monetary policy on the general price level in the democratic Republic of Congo. American Journal of Economics, 10(6), 407-417.

Rogerson, P.A., 2001. Statistical Methods for Geography. Sage Publishing.

Soni, D. Impact of monetary policy on Price stability and financial stability in India.

Svensson, L. E. (2000). How should monetary policy be conducted in an era of price stability? (No. w7516). National bureau of economic research.

Woodford, M. (1999). Commentary: How should monetary policy be conducted in an era of price stability?.New challenges for monetary policy, 277316.

Zayed, N. M. (2018). Testing Taylor's rule to examine monetary policy regarding bank rate, inflation and output gap of Bangladesh: 1972-2016. Academy of Accounting and Financial Studies Journal, 22(1), 1-11.

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