Impact of Monetary Policy on Inflation in Bangladesh: An Econometric Analysis

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ABSTRACT

This study investigates how the state of inflation in Bangladesh is affected by monetary policy between 2015 and 2024. The main goals of the study have to find out which economic factors are the most important in affecting inflation and how well these devices are applied to preserve price stability in the global economy. This study also aims to understand how the supply of money, credit growth, foreign reserves, and economic development affect the overall inflation rate because inflation is a frequent problem in Bangladesh that affects homes, businesses and long -term economic plans. The study was used to assess several regression analysis and secondary data to assess relations between inflation and several important indicators, such as GDP, M1 (narrow money), M2 (comprehensive funds), reserved funds, pure foreign property (NFA), and domestic credit growth. These indicators were chosen due to the major components of monetary policy and their ability to capture the comprehensive economic environment that contains inflation. One of the most significant insights we have is that the broad money supply and inflation have a positive and favorable relationship. It has the impact of increasing inflation if M2 increases significantly without a comparable increase in goods and services. Considering all, this study supports the hypothesis that monetary policy has an average status on inflation in Bangladesh.

Keywords: Inflation, Monetary Policy, M1, M2, Broad Money GEL Classification: E5, E520

Background of Study

For developing nations like Bangladesh, inflation is a key macroeconomic problem. The economy of Bangladesh is now very dynamic and growing faster. There has been inflationary pressure on the Bangladesh economy at various points. Furthermore, both internal and external economic factors have worked together to inflate the Bangladesh economy. Inflation must be controlled to ensure economic stability, encourage investment and promote sustainable growth. Price level fluctuation alters business investment, export competitiveness, and overall country outlook, other than disturbing consumption of households. Historically, the price of food mainly drove inflation in Bangladesh owing to swings in their prices leading to exchange rate volatility, energy costs and shifts in the price of commodities internationally. The process by which a nation's government, central bank, or monetary authority regulates (i) the money supply, (ii) the money availability, and (iii) the money cost or interest rate in order to achieve a set of goals aimed at the stability and growth of the economy is known as monetary policy. The relationship between an economy's interest rates—that is, the cost of borrowing money—and its total money supply forms the basis of monetary policy

In the economic history, the Bangladesh economy has been facing severe price instability in various periods. Thus, the price instability is one of the significant macroeconomic challenges for this economy. According to the

fundamental concept of economics, inflation arises from the excess money supply and credit these leads to many economic problems. Excessive aggregate demand and pressure of production cost create demand pull and cost push inflation, respectively (Amiri and Talbi, 2014; Kaouther and Besma, 2014). The inefficient system of production and disorganized allocation of goods and services are responsible for structural inflation. Although the percentage of inflation continuously varies over time, the overall economy has been affected adversely or favorably. Policymakers try to control inflation within their limits. An empirical analysis is essential for monetary policy, which specifies some course of action in defining the short-run and long-run connection of money supply to inflation in Bangladesh.

In Bangladesh, monetary policy is designed with a focus on sustaining robust growth while curbing inflation. Many economists, policymakers, and experts argue that a low inflation rate, particularly one below a certain threshold, is positively correlated with economic growth and contributes to economic stability. When inflation rises above the threshold level, it negatively affects the economy's smooth functioning. It drives up living costs, adversely impacting the general population, especially the impoverished. Additionally, inflationary pressures increase production costs, which hinder investment and have a negative effect on GDP growth. The exchange rate influences a country's trade balance, which consequently impacts economic expansion. For Bangladesh, the price of imports and exports can be impacted by changes in the exchange rate. A depreciating currency might make less expensive trade and more costly purchases, potentially boosting local industries but also increasing inflationary pressures.

Effective macroeconomic management requires an understanding of the connection between inflation and monetary policy tools. When examining inflationary tendencies, key metrics like GDP, M1 (narrow money), M2 (wide money), Reserve Money, Net Foreign Assets (NFA), and Domestic Credit Growth are thought to be essential. The money supply's most liquid elements, such as demand deposits and currency in circulation, are represented by M1. Conversely, M2 encompasses more general financial assets such as time and savings deposits. If not properly controlled, the growth of reserve money, which represents the total amount of currency in circulation as well as bank reserves, can have a major impact on inflation. Furthermore, net foreign assets have an impact on import prices and the currency rate, which in turn affects price stability overall. Domestic credit growth shows how much money is being lent out in the economy, which can lead to inflationary demand as well as profitable investments. Finally, the overall performance of the economy is reflected in GDP growth, which can reduce inflationary pressures by increasing productivity and production.

Monetary policy is concerned with the measures taken to control the supply of money, the cost and availability of credit. Like many developing countries, the primary focus of monetary policies in Bangladesh is to obtain high sustainable growth. However, to achieve and maintain a higher growth rate, policy makers need to understand the determinants of growth as well as how policies affect growth. In a developing country like ours the monetary policy has been effectively used as a tool for overcoming depression and inflation. Along with economic growth monetary policy also has to ensure price stability, as excessive inflation has an adverse distribution effect and hinders economic development.

Inflation is one of the most important macroeconomic variables in any economy for determining the monetary and fiscal policies of the government. It is measured by CPI. Using the data from 2015-2020, we observed that inflation movement in Bangladesh has been cyclic. There are many opinions regarding the proper reasons for inflation. Some researchers think that agricultural bottlenecks and successive balance of payment deficits are responsible for inflation. Another group thinks that expansionary monetary policy is the main cause of inflation in Bangladesh. Whatever the reasons for inflation and its impact on the economy of Bangladesh, this paper tries to determine the impacts of monetary policy on inflation.

This means that the central bank must keep a careful eye on and control the expansion of the money supply. Inflation has a significant negative impact on net foreign assets, which is another dire consequence. This implies that when Bangladesh has excess foreign exchange reserves, primarily from exports and remittances, it helps keep prices from going up too much instead. In addition to lowering import prices and stabilizing currency rates, a robust external balance guards against inflationary shocks.

Interestingly, it was also displayed that inflation was negatively affected by expansion of domestic debt. This suggests that most of Bangladesh credits have been used for useful purposes, such as funding investment and

business, which reduces inflation pressure and improves supply. Despite not being significant in this research, M1, reserve money, and GDP all had inflationary reactions. Policy maker, especially Bangladesh Bank, can use these findings to affect the development of more effective inflation-control measures. Controlling M2 development, promoting foreign reserves, and expanding credit in productive areas can have a significant impact on all value stability. Additionally, the study recommends better balance between fiscal and monetary authorities, greater commercialization of monetary policy equipment and increased use of forecast techniques. All things were considered, this thesis supports the hypothesis that monetary policy has an average status on inflation in Bangladesh.

It highlights how important it is to maintain control over the money supply, boost external strength by building up foreign reserves, and use credit responsibly to maintain genuine economic activity. Bangladesh may better control inflation and contribute to its long-term economic objectives with a more targeted and knowledgeable monetary policy approach.

The Objective of the Study

Analyzing the effect of monetary policy on inflation in Bangladesh is the main goal of this study. To encourage sustainable growth and preserve economic stability, this study specifically aims to comprehend how various monetary policy tools affect inflationary tendencies in the Bangladeshi economy.

The most liquid parts of the money supply, demand deposits and currency in circulation, are included in M1, sometimes referred to as narrow money. Consumer spending and economic activity are directly impacted by changes in M1, and these factors in turn have an impact on inflation. The overall amount of liquidity in the economy is represented by M2, or wide money, which goes beyond M1 to include time deposits and savings. Finding out if increasing or decreasing inflation in Bangladesh is linked to changes in M1 and M2 is the aim of the study. Determining how to regulate the money supply to maintain price stability is made easier for policymakers when they comprehend this relationship.

Reserve Money, also known as the monetary base, is made up of both commercial bank reserves maintained at the central bank and currency that is in circulation. It provides the framework for the expansion of the money supply. The study attempts to determine if increasing the monetary base directly causes price rises by examining the impact of Reserve Money adjustments on inflation. If reserve money has a substantial impact on inflation, central bank actions may be required to control its rise

The difference between a nation's foreign assets and foreign liabilities is known as net foreign assets. It affects import prices as well as the value of the local currency. As NFA rises (for example, as a result of increased exports or remittances), the nation's currency may appreciate, lowering import prices and containing inflation. In contrast, a decline in NFA may cause the currency to weaken, raising the cost of imports and driving up inflation. The study evaluates the impacts of NFA variations on Bangladeshi inflation, specifically as they relate to import prices and the currency rate.

This is a measure of how much money the financial industry lends to both individuals and companies. Credit expansion increases the amount of money that businesses and people may spend, which can raise demand and cause inflation. The study aims to ascertain whether Bangladesh's expanding domestic credit leads to excessive demand that drives inflation or to profitable investments that support price stability.

This reflects the total value of all goods and services produced by the country. If economic expansion boosts both supply and demand, strong GDP growth can accommodate it without triggering inflation. The research investigates the relationship between economic growth and inflation, looking into whether an increase in GDP aids in mitigating inflationary pressures or if it contributes to accelerating price hikes in Bangladesh's economy.

Research Question

The following research questions serve as the study's guidelines:

i. What effect does Bangladesh's inflation have on the growth of M1 and M2?

ii. What impact does reserve money have on inflationary pressures?

iii. How does the inflation rate alter in response to changes in net foreign assets?

iv. Does the growth of domestic credit fuel inflation or economic expansion?

v. How much does GDP growth aid in keeping inflation under control?

Significance of the Study

By demonstrating how successful monetary policy tools can control inflation in the context of Bangladesh, this study provides important insights for researchers, financial institutions, and policymakers. Controlling inflation is essential for maintaining economic stability, promoting sustainable growth, and lowering poverty in a developing nation like Bangladesh. High inflation increases living expenses, reduces purchasing power, and creates uncertainty for households and businesses. Therefore, developing strategies that stabilize prices and advance long-term economic growth requires an understanding of how monetary policy influences inflationary trends. Important monetary aggregates like M1 (narrow money), M2 (broad money), Reserve Money, Net Foreign Assets, Domestic Credit Growth, and GDP are highlighted in the study as having a significant impact on inflationary trends. The study shows how shifts in the money supply, credit expansion, and foreign asset positions affect inflation in Bangladesh by looking at these variables. As it develops and implements successful policy interventions using instruments like Open Market Operations (OMOs), Cash Reserve Ratio (CRR), Statutory Liquidity Ratio (SLR), and interest rate adjustments, Bangladesh Bank needs to know this information. Furthermore, by providing current empirical data on the relationship between inflation and monetary aggregates, this study enhances scholarly literature. In contrast to previous research, this study makes use of up-to-date data and sophisticated econometric techniques to account for changes in the domestic credit market, exchange rate swings, and global economic shifts. This comprehensive approach fills in current knowledge gaps and gives policymakers a better understanding of how effective monetary control measures are. It is expected that the study's findings will help Bangladesh Bank make strategic decisions and improve its monetary policy tactics, which are intended to reduce inflation and promote economic expansion. This entails enhancing foreign reserve management, fine-tuning the targeting of money supply adjustments, and making sure that credit expansion is focused on profitable ventures rather than speculative activities. If these policies are implemented effectively, they can support sustainable development in Bangladesh, boost economic confidence, and stabilize price levels. Furthermore, this study lays the groundwork for further research on financial policy development and macroeconomic stability in emerging economies. Policymakers can anticipate inflationary pressures, proactively handle economic shocks, and preserve economic resilience by understanding the relationship between monetary policy and inflation. Overall, it is anticipated that the findings of this study will support the sustainable growth of the Bangladeshi economy, improve inflation forecasting, and help create effective monetary policies.

LITERATURE REVIEW

There are heuristic studies have been conducted on monetary policy globally over the past decades. Money supply and it control through the monetary policy pursued by the central bank of a country can play a significant role in the managing and controlling of inflation in that country. There are some controversial theories and studies in both relationship between inflation and monetary policy. Money supply growth causes inflation that was tested by observing the correlation between the percentages of inflation rate with the percentage growth of monetary tools. The causes can be detected by changes in changes inflation rate and monetary growth. The changes of monetary growth also the causes of changes of inflations.

MV=PV, Where M is the money supply. V = Velocity of money: P = Price level: Y = Real output. People and merchandise are traveling somewhat faster than usual, or not quite as quickly if V and Y are stable, then a rise in M1 leads directly to an increase in P.

Goodhart (1984) results, M1, were seen as a key signal of transactional liquidity by the central bank because of its anticipated capacity to signal Inflation, being a direct link with household expenditure. The equation of exchange ties the money supply to Inflation.

Friedman and Schwartz (1963), emphasized the importance of define between "narrow" and "broad" money aggregates view. M1 is narrow money, which is most liquid money.

Taslim (1982) states that whereas the structuralist argues that structural bottlenecks in the economy trigger Inflation, the monetarist points out that Inflation is a manifestation of an excessive money supply as a consequence of incorrect monetary and fiscal policies. The study reveals the inflation process in Bangladesh. It demonstrates that it neither adheres to the inflation process based on the structuralist view nor the inflation process derived from the monetarist

The 1970s–1980s Federal Reserve treated M2 as a crucial inflationary forecasting tool despite its influence being shaped by low interest rates at the time. M2 rises more as a result of transactions of assets than transactions in consumer goods.

Beckworth (2020) argues, on the other hand, that the components of M2 reflect deferred spending, which in turn attenuates the direct inflationary effect of M2, highlighting the importance of aggregate demand.

McCandless and Weber (1995) empirically examined data from 110 countries for 30 years and discovered a close long-run relationship between the growth of broad money and Inflation at pre-determination of M2 but a less uniform relationship between the development of reserve money and Inflation due to the presence of variations in the money multiplier. Reserve requirements and open-market operations, on the other hand, both have a direct effect on reserve money.

Mishkin (2007) argues that central banks in inflation-targeting countries do not have reserve money as the primary objective of monetary policy; instead, they use it discretionarily as a tool for targeting interest rates. In these instances, the expectations component of Inflation is a significant influence on actual Inflation, weakening the mechanical connection between reserve money and prices.

Moroney (2002) relates the relationship of long-run version of the quantity theory between money growth, real GDP, and the Price Level, suggests that the average growth rate of broad money growth is a powerful crosssectional predictor of Inflation. While the theory generally holds for most countries, there are exceptions, particularly when money growth is slow.

Mohammad, Nayeem Abdullah, (2012) analyze the records indicated that Inflation has increased throughout with the change in monetary policy. According to the latest data from Jan 2007 to October 2011, the pattern of inflation movement in Bangladesh is cyclical.

Hameed (2010) Influence of Monetary Policy on Gross Domestic Product (GDP); Inflation Rate and Money Supply. This is indeed significantly affects a country's GDP, and it also undoubtedly impacts a multitude of non-quantifiable elements. Focuses on research and development projects for economic growth, Quality improvements, Household production, health, life expectancy, and environmental sustainability, as well as political stability.

Nwoko, Nnenna M. (2016) examined how Nigeria's Monetary Policies can be used to enhance Economic Development: Evidence from 1990-2011. The exercise reveals that the CBN Monetary Policy measures influence the monetary and real aggregates. They show that few factors influenced the smaller GDP, as noted by Gorecki et al. at the middle level. The interest rate has a negative and significant effect. They note that monetary policy can play a valuable role in nudging investment and providing support for the economy.

Agalega and Antwi (2012) investigate the relationship between interest rates, GDP, and Inflation among Ghanaians, and these variables exhibit a strong correlation.

Ihsaan and Anjum (2013)140, using the data on the money supply and the inflation rate of Pakistan over the period 2001-2011, are of the view that an increase in their supply is an increase in the inflation rate. They argued that the GDP depends on the interest rate, and hence, the interest rate should be adjusted to be appropriate to keep the inflation rate at 5-6 percent.

Chowdhury, L.S. (2015) posits that Microeconomic policies play an analytical role in achieving sustainable economic stability in a country that fosters conditions for accelerated economic growth. Monetary policy affects the output level and the financial growth rate and balances total liquidity in the economy. Following the global upheaval of 2008-2009, the Central Bank of Bangladesh has been targeting Sustained, Accelerated, and inclusive economic growth, focusing on the Rural-Urban gap, price stability, and a flow of funds against the global and domestic backdrop, aiming to keep Inflation within a tolerable few levels.

Chowdhury, A.R. (1995) examines the relationship between money, price, and exchange rate series in Bangladesh over the period 1972-1992. They conclude that Bangladesh can't be accounted for only in terms of the monetarist or structuralist explanation for Inflation. The use of monetary aggregates, money, and policy has a one-way influence on real output. They observed that the effects of economic shocks on Inflation are strong, albeit short-lived in nature.

Sadia Afrin's (2017) paper provides new insight into the monetary transmission mechanism in Bangladesh. The key findings are the Monetary policy has a significant effect on the domestic price level, and the bank credit channel is an essential channel of monetary transmission, a positive shock to credit can have inflationary effects, and the central bank plays the role of a stabilizer by increasing the policy rate; and external shocks play an essential role in the behavior of domestic macro aggregates. There is relevance to the findings in terms of the growing complexities faced by the Bangladesh Bank and the requirement for gradual financial liberalization of Bangladesh's economy.

Hossain (2003), according to whom managing the rate of money growth is equivalent to managing Inflation. The causal link between money growth and Inflation is the cornerstone of that case. The link is more evident over the long term, particularly when the country pursues a flexible exchange rate system. In a system of fixed or pegged exchange rates, exchange rates, the relationship between Inflation and the growth of the money supply is not precise and thus needs to be viewed as an empirical fact. There is a common factor in Inflation in advanced economies that helps explain national inflation dynamics. They demonstrate that for low Inflation, beyond commodity price developments, adverse demand shocks play a decisive role both globally and domestically. They discuss inflation dynamics, but the results are not 100% conclusive. The discussion is about the measure of the slack, curvature, and stability of the received curve, the advantages of the CPHIC for understanding the dynamics of Inflation, and the stability of the coefficients of inflation inertia, economic conditions, inflation expectations, and external

Arfanuzzaman, M.D. (2014) investigated the behavior of Bangladesh's money supply and its long-run association with the economic growth rate for the period 1974 - 1989. Doing so suggests a strong correlation between the GDP rate and the money supply. They also find the force that can account for GDP decentration about the total money (M).

Muhammadpour (2012) examined the relationship between Malaysia's GDP and monetary policy, utilizing quarterly data from 1991 to 2011. They demonstrate an unambiguous long -run equilibrium relationship between real GDP in Zimbabwe and the monetary aggregates M1, M2, and M3, as well as the real interest rate, using both the cointegration approach and the Vector Error Correction Model (VECM). VECMM analysis highlights the statistical significance of M1, M2, and M3 and their long-term impact on GDP. Therefore, we may predict, by the conclusion of the study that the real GDP of the Malaysian economy will increase in the event of a money supply expansion.

Ndungu and Durevall (1998) looked at the food supply, money demand, and inflation from 1974 to 1996. In Kenya, this error correction model was used. In their view, the money supply and interest rate are short-term factors that contribute to inflation, whereas the exchange rate, international prices, and conditions of trade are long-term factors. The study came to the conclusion that, when compared to the money supply, the exchange rate makes a better nominal anchor.

Umaru and Zubairu, (2012) investigated the impact of inflation on economic growth and development in Nigeria between 1970-2010 through the application of Augmented Dickey-Fuller technique in testing the unit root property of the series and Granger causality test of causation between GDP and inflation. The results of unit root

suggest that all the variables in the model are stationary and the results of Causality suggest that GDP causes inflation and not inflation causing GDP. The results also revealed that inflation possessed a positive impact on economic growth through encouraging productivity and output level and on evolution of total factor productivity. A good performance of an economy in terms of per capita growth may therefore be attributed to the rate of inflation in the country.

Micheal and Ebibai (2014), examined the impact of monetary policy on selected macroeconomic variables such as gross domestic product, inflation and balance of payment in Nigeria using OLS regression analysis. The result shows that the provision of investment friendly environment in Nigeria will increase the growth rate of GDP.

Akujobi (2012), investigated the impact of monetary policy instrument on economic development of Nigeria using multiple regression technique and found that Treasury bill, minimum rediscount rate and liquidity rate have significant impact on economic development of Nigeria

Mallik, (2001), shows in the investigations into the existence and nature of the link between inflation and economic growth have experienced a long history. Originating in the Latin American context in the 1950s, the issue has generated an enduring debate between structuralists and monetarists. The structuralists believe that inflation is essential for economic growth whereas the monetarists see inflation as detrimental to economic progress. There are two aspects to this debate: (a) the nature of the relationship if one exists and (b) the direction of causality.

Grauwe and Polan (2005) used a sample of about 160 countries with a period of 30 years to determine of relationship between growth in GDP, money, and price level, and found a strong positive and less proportional long-run relationship between inflation and money supply on output growth. They viewed that a strong relationship between inflation and money growth is evident due to the existence of high-inflation countries.

Min (2005) shows that economists now widely accept that inflation has a negative effect on economic growth; researchers did not detect this effect in data from the 1950s and the 1960s.

Umaru and Zubairu, (2012) investigated the impact of inflation on economic growth and development in Nigeria between 1970-2010 through the application of Augmented Dickey-Fuller technique in testing the unit root property of the series and Granger causality test of causation between GDP and inflation. The results of unit root suggest that all the variables in the model are stationary and the results of Causality suggest that GDP causes inflation and not inflation causing GDP. The results also revealed that inflation possessed a positive impact on economic growth through encouraging productivity and output level and on evolution of total factor productivity. A good performance of an economy in terms of per capita growth may therefore be attributed to the rate of inflation in the country.

Su, Chi –Wei & Fan, (2016) examined relationship between the growth in money supply and price level in China using causality test. The results reveal that growth of money supply affects inflation both positively and negatively in some sub periods and inflation has also similar effects on money growth in China. If money growth does not offset output growth, only reduction of money supply cannot contain inflation. It is noticeable that in maintaining stability in price level and economic growth, a stable growth in money supply is needed in China.

Ahmad and Mortaza (2010), look that the inflation can negatively affect economic growth in the long run specially above the threshold level of 6 percent. This result is based on the data of CPI and GDP of Bangladesh for the period of 1980 to 2005.

However many studies have been carried out to establish the relationship and the impact of monetary policy on the inflation, but there are some for Bangladesh. The monetary policy has a significant but not exclusive impact on inflation in Bangladesh. While tools like money supply adjustments influence inflation, structural factors in the transmission mechanism limit policy effectiveness. For improved outcomes, scholars recommend reforms in the financial sector, enhanced policy credibility, and a shift toward a more flexible inflation-targeting framework.

METHODOLOGY

This chapter has been divided into three parts. First one discusses the data sources and nature of data in detail. Second one discusses the model to be applied to find out the results. And third and last part states the hypothesis to be checked for this study.

Data Collection: In order to check impact of monetary policy on inflation of Bangladesh, the comprehensive data has been gathered for the period 2015-2024. Main data source in this regard has been the Bangladesh Bank. Moreover official website Bangladesh Bureau of statistics and Ministry of Finance has also been visited in this regard.

Variables: Description for each variable under study is as under:

i. **Inflation Rate:** Stable inflation is recognized as an integral component of sound macroeconomic policies. Inflation refers to the persistent rise in the general price level. Inflation affects the distribution of both income and wealth. Nominal incomes of some individuals tend to increase with inflation. In contrast, those of others remain constant, thus causing a change in the distribution of income in favor of the former group. The complex and multidimensional inflation problem needs a systematic and scientific understanding, examination, investigation, and analysis. It standardized all data to the base year, FY 2015-2024, for econometric analysis.

ii. **Narrow money (M1):** The Narrow money is currency in circulation plus sight deposits held by domestic non-banks. M1 includes currency such as banknotes and coins, as well as balances that can immediately be converted into currency or used for cashless payments, such as overnight deposits.

iii. **Broad Money (M2):** Money is defined more broadly as M2, which adds other kinds of deposits in addition to everything in M1. M2 is used to predict potential rises or falls in inflation rates. The reason for this is that it provides a more comprehensive view of an economy's money supply than M1, which solely considers money held by the general population. Frequent revisions in the definition of monetary aggregates resulted from the breakdown of the stable link between monetary aggregates and macroeconomic variables caused by structural changes in financial markets and the introduction of new financial instruments. Multiple monetary aggregates are typically developed in practice with the intention that they will collectively give additional information for the conduct of monetary policy and economic developments.

iv. **Reserve Money:** One type of foreign currency that central banks and other monetary authorities hold in substantial amounts as part of their foreign exchange reserves is known as a reserve currency. The reserve currency is usable in all facets of the global economy, including overseas investments and transactions. The term "hard currency" or "safe-haven currency" is frequently used.

v. **Net Foreign Assets:** A nation's net foreign asset position is calculated by subtracting the value of its domestic assets held by foreigners from the value of its net claims on the rest of the world. A nation's foreign assets, such as its foreign currency reserves and foreign-held assets, are valued at their total worth less its international liabilities, which include debt due to foreign organizations. In essence, it's a gauge of a nation's net position in relation to the rest of the globe in terms of its financial assets and liabilities. A net creditor position is indicated by a positive NFA, whilst a net debtor position is suggested by a negative NFA.

vi. **Gross Domestic Product (GDP):** GDP evaluates the total amount of goods and services generated in an economy over a one-year period, using current prices. A well-known formula for GDP has been stated as the total market value of all final goods and services produced in a country in a given year, equal to total consumer, investment, and government spending, plus the value of exports, minus the value of imports. GDP is the most commonly known measure of national income, output, and growth. GDP is of two types. Nominal GDP is a measure of money spent. Real GDP corrects the gross nominal GDP figure for inflation, making real GDP more useful for historical comparison. Nominal GDP is sometimes called money GDP, and real GDP is sometimes called inflation-corrected GDP or constant price GDP. For the purpose of this study, data for real GDP for the period 2015-2024 has been considered.

Method of Data Analysis: Multiple regression analysis is the estimation technique that is being employed in this study to determine the impact of monetary policy on the economic growth of Bangladesh 2015-2024.

Model Specification: The model to capture the impact of monetary policy on Bangladesh inflation, Variables are stated below with the independent variables as Narrow money (M1), Broad Money (M2), Reserve Money, Net Foreign Assets, Net Domestic Assets and GDP. This research utilized the regression method to explain the impact of monetary tools on inflation rate.

Model's regression form is as follows:

Inflation = β0+β1(M1) +β2(M2) +β3(RM)+β4(NFA)+β5(NDA)+β6(GDP)+€

Here, in equation

M1= Money supply represented by narrow money as growth percentage

M2= Money supply represented by broad money as growth percentage

RM= Represented by Reserve Money

NFA= Represented by Net Foreign Assets

NDA= Represented by Net Domestic Assets

GDP= Real Gross domestic product used as GDP of current market price €=
Is the error terms

Model's weighted average formula:

Finding M1 value using numerical methods to estimate the velocity or a value between two known values.

VH1= VY-1+0.05(VY-VY-1)

VY-1= Value of at the previous time step

VY= Value of the current time step

VH= an interpolated or estimated value

Regression Analysis

This Chapter covers the estimation and analysis of data for the period 2015-2024 to check out the Impact of monetary policy through inflation on Bangladesh. Following this equation by observing 10 data.

Table 1: Summary of regression result

	Coefficients	Standard Error	t Stat	P-value
Intercept	9.123686569	2.04938218	4.451920514	0.000652316
X Variable 1	-0.015076866	0.030574519	-0.493118653	0.630153585
X Variable 2	0.538261109	0.20771647	2.591326092	0.022371058
X Variable 3	0.027144543	0.032110475	0.845348515	0.413205032
X Variable 4	-0.167599313	0.025661691	-6.531109501	0.000019087
X Variable 5	-0.482449231	0.109175295	-4.419032999	0.000692955
X Variable 6	-0.266387806	0.207913822	-1.281241446	0.222492425

Table 2: Model Summary for Regression Analysis

Multiple R	R Square	Adjusted R Square	Standard Error	Intercept
0.9502	0.9029	0.8581	0.6659	9.1236

Dependent Variable: Growth in Inflation Independent Variable: Narrow money (M1), Broad Money (M2), Reserve Money, Net Foreign Assets, Net Domestic Assets and GDP from the results of the regression model, It has been observed that R was 0.9502 that indicates that the strength of relationship was strong, and the coefficient of R square was 0.9029 which means that 90.29 percent of the model was explained.

Table 3: ANOVA Results for Regression Analysis.

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	53.6214465	8.936907751	20.15424159	6.96962E-06
Residual	13	5.764533497	0.443425654		
Total	19	59.38598			

An ANOVA test also verified the regression analysis's finding that there is a strong correlation between the independent variables and Bangladesh's inflation rate. The model is extremely significant, as previously said, as demonstrated by the very low significance value (6.96962E-06) and the F-value of 20.1542. This suggests that a significant amount of the volatility in inflation during the years 2015–2024 can be explained by independent variables. Additionally, the mean square error (0.4434) and low residual sum of squares (5.7645) indicate an excellent fit to the data.

Hypothesis

On the basis of literature review, following hypothesis have been devised for the purpose of this Study:

The result of Interpretation is,

H0= for each coefficient is that the true coefficient is zero Ha= for each coefficient is that the false is not zero

p- value < 0.05 is typically considered statistically significant, p-value > 0.10 is generally not significant

Graphical Analysis

This paper presents an overview of a multiple regression model developed to analyze the impact of monetary policy tools affect inflation in Bangladesh 2015 to 2024. The model shows how important indicators such as M1, M2, Reserve Money, Net Foreign Assets , Net Domestic Assets, and GDP Growth, affect inflation in terms of the sign and magnitude of the coefficients.

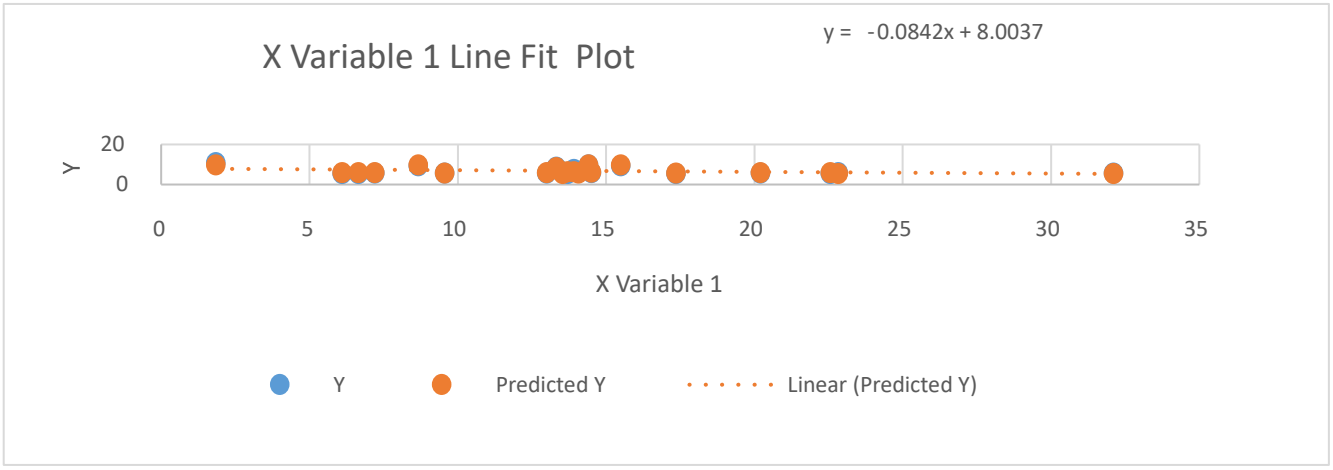

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Figure 1 Linear Regression

Analysis on Y Based on Variable X1

Based on the results of the regression: M1 Growth was found to be negative and statistically insignificant (β = –0.0151, p = 0.630), result of that, p = 0.630 > 0.05, indicating it is not statistically significant. Although M1 is increases, inflation does not consider as a significant drop during the analyzed period. This outcome deviates from standard predictions, which state that inflation is usually occurs by an increase in narrow money. It might, however, be an indication of Bangladesh Bank's strict monetary policy or sterilization efforts. M1 increases, inflation decreases, implying a negative correlation.

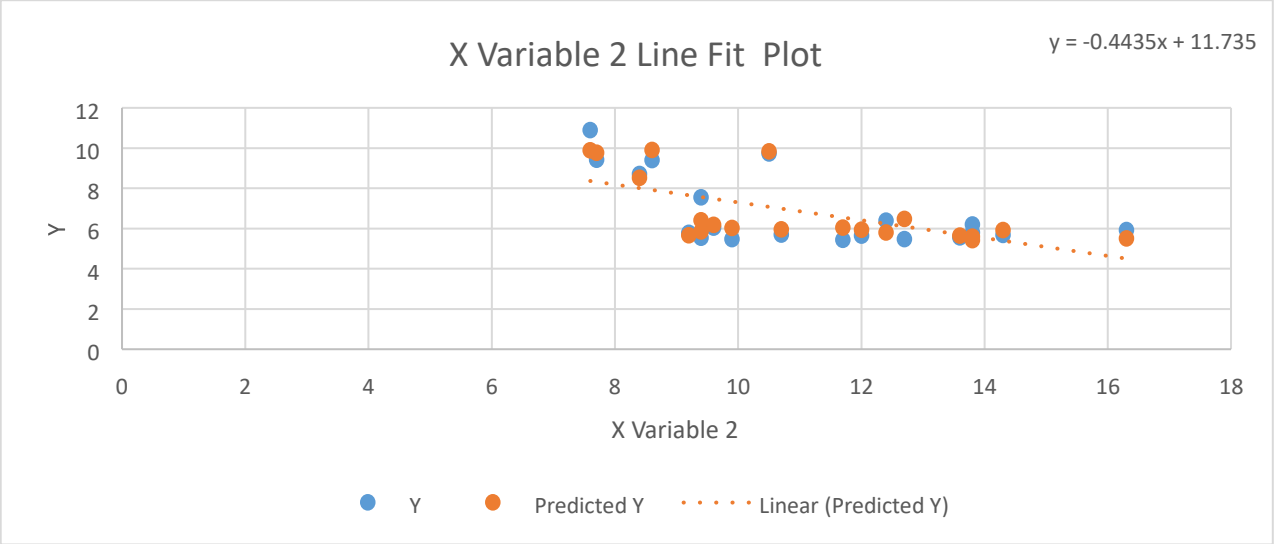

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Figure 2 Linear Regression Analysis on Y Based on Variable X2

The coefficient (β) for M2 growth broad money supply was found to be positive and statistically significant (β = 0.5383, p = 0.022). Since p = 0.022 < 0.05, it is strongly supported. When everything else is held constant, an increase of 1% in M2, is associated with an increase of inflation standing at 0.54%. Economic theory suggests that more liquidity in a system tends to increase inflation pressure. When M2 rises, so does inflation, indicating a correlation.

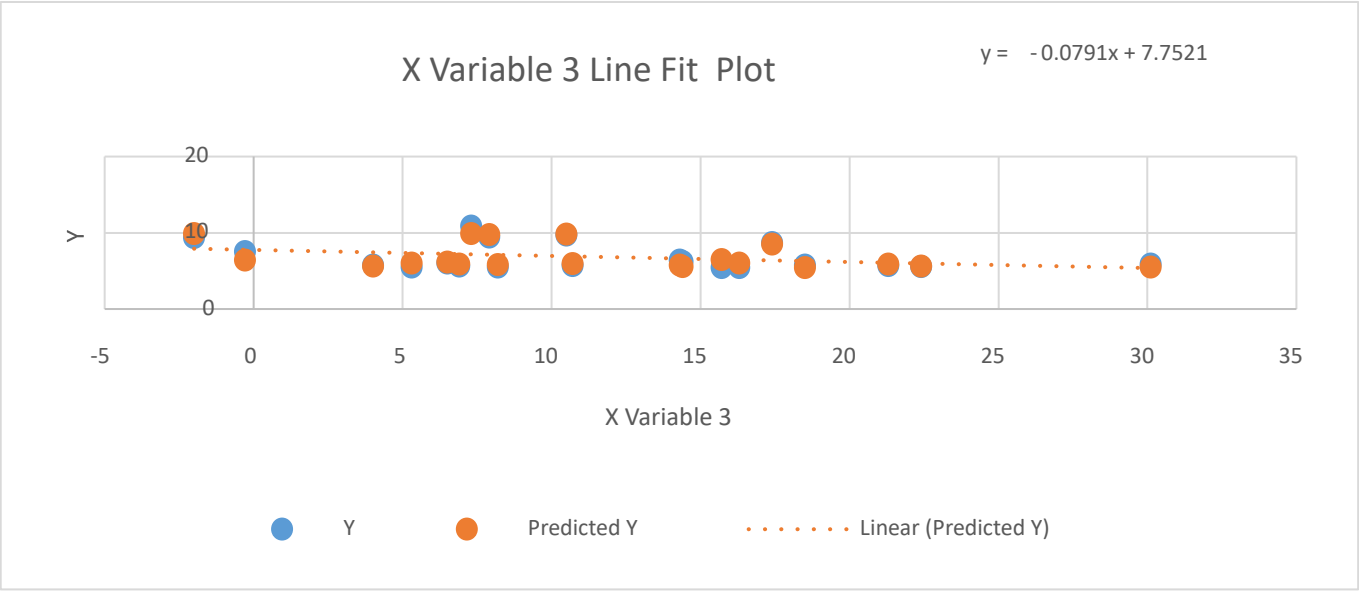

Figure 3: Linear Regression Analysis on Y Based on Variable X3

Reserve Money had a positive but statistically insignificant effect on inflation (β = 0.0271, p = 0.413), with p = 0.413 > 0.05. This suggests that its influence on inflation dynamics was minimal during the study period. This could be the result of moderate credit expansion or counterbalance actions taken by the central bank. Reserve Money increases, inflation increases, supporting a positive correlation.

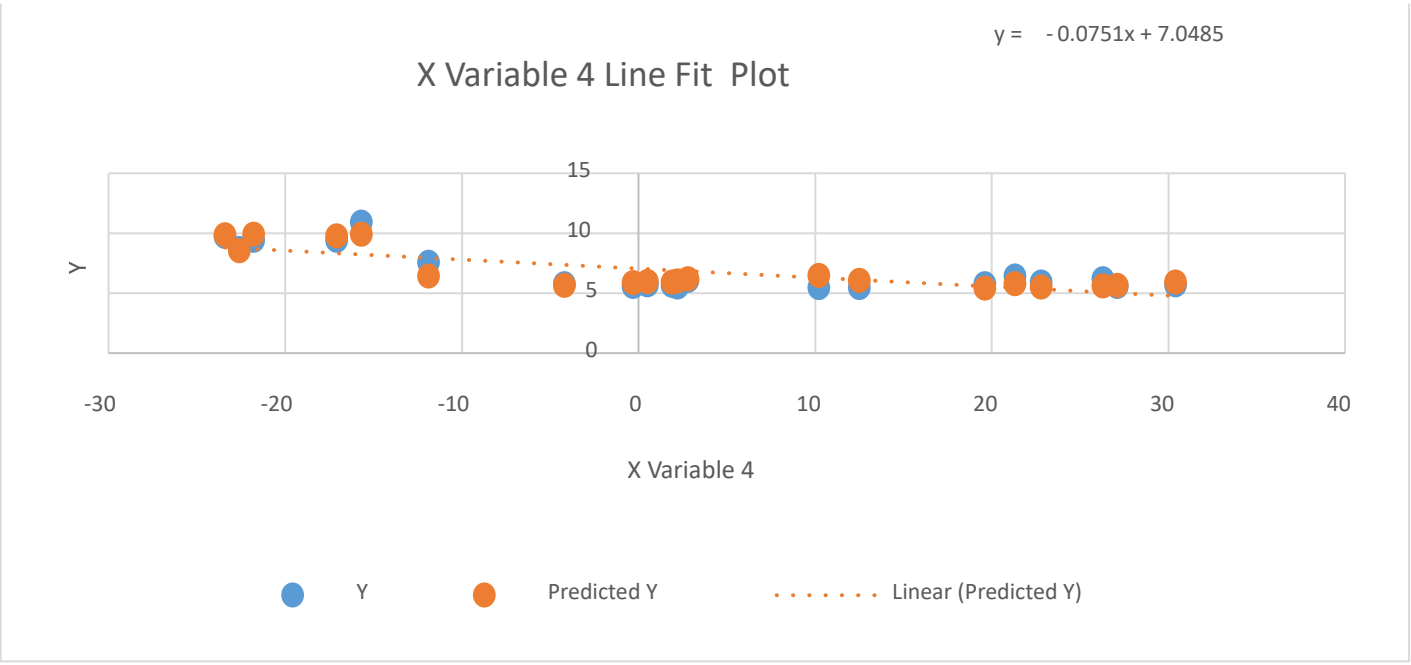

Figure 4: Linear Regression Analysis on Y Based on Variable X4

The inflation was negatively affected by Net Foreign Assets having a significantly strong effect on inflation (β = –0.1676, p = 0.0000190), with p = 0.0000190 < 0.01, means very strong significant value. This indicates that higher Net Foreign Assets presumably from higher remittances or trade surpluses could lower inflation, most likely by strengthening the exchange rate or lowering import prices. Net foreign assets increases, inflation decreases, implying a negative correlation.

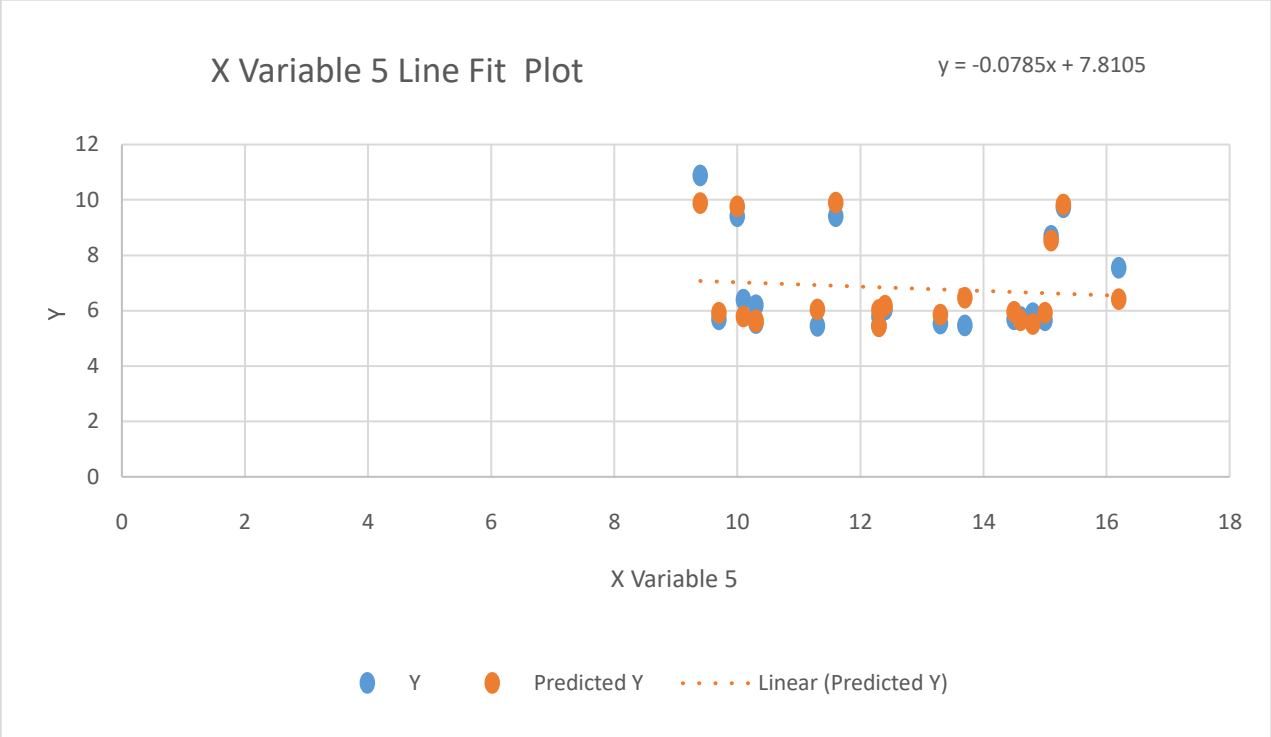

Figure 5: Linear Regression Analysis on Y Based on Variable X5

Domestic Credit Growth negatively and significantly influenced inflation (β = –0.4824, p = 0.001). Since p = 0.001 < 0.01, it can be concluded that Domestic Credit Growth influence inflation strongly. Rephrase Undo This shows that credit expansion was not the cause of inflation, but instead may have helped absorb inflationary pressure through productive investment. Domestic credit growth increases, and inflation decreases, implying a negative correlation.

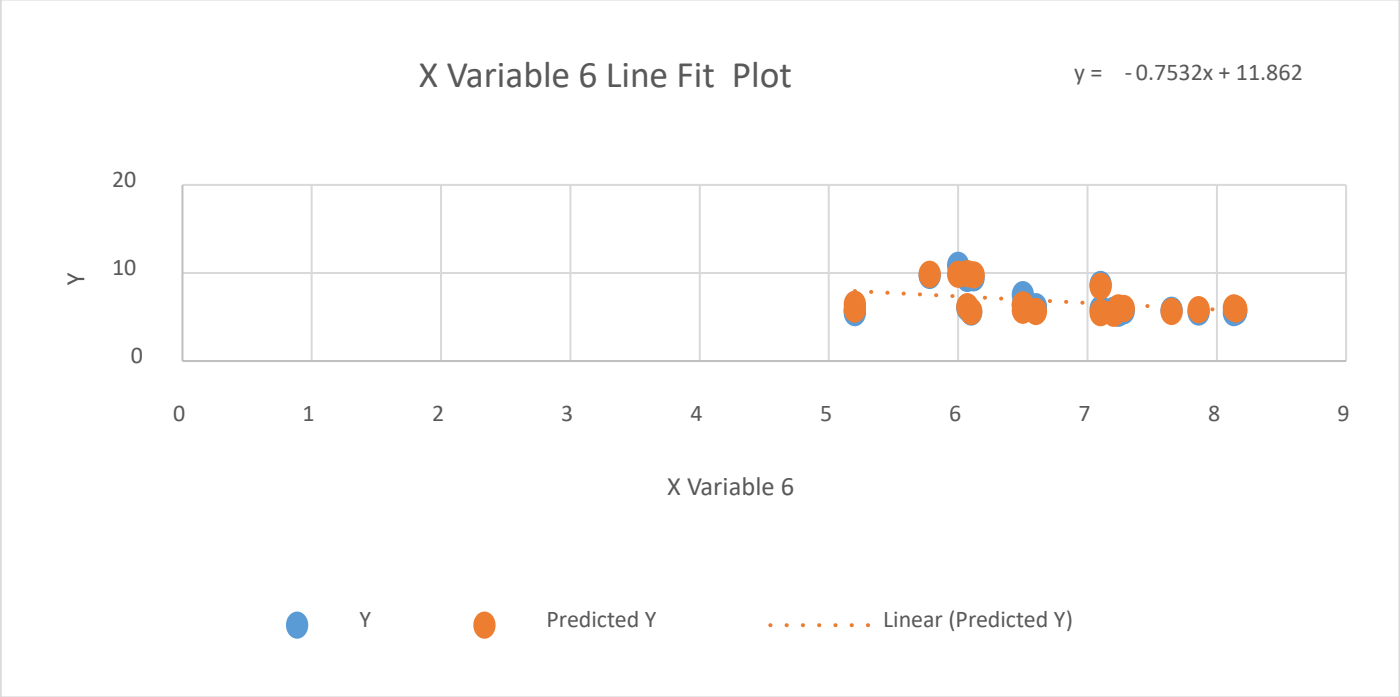

Figure 6: Linear Regression Analysis on Y Based on Variable X6

The result of the analysis shows a negative but not significant effect of GDP growth on inflation ($\beta = -0.2664$; $p = 0.222$). Where $p = 0.222 > 0.05$. The apparent lack of significance indicates that other forces may have been dominant in these relationships, although their direction suggests a dampening effect on inflation. Rephrase Undo So, GDP rises and inflation shrinks, meaning there is a negative correlation.

FINDINGS

The study's conclusions highlight the important and intricate role that Bangladesh's monetary policy paradigm plays in managing inflation. A detailed assessment of the effects of various monetary aggregates in conjunction with a wide range of macroeconomic factors, particularly imputed interest rates, on price stability is revealed by the analysis carried out during the review period of 2015–2024. The significance of the statistical findings, such as the sign and magnitude of each variable's coefficient, offers direction for the creation of general economic policy as well as monetary policy.

Furthermore, one of the main causes of Bangladesh's inflation was found to be M2 Growth. The paper's statistical results support the notion that M2 and inflation are positively correlated, indicating a 1% increase. In M2 causes the inflation rate to increase by about 0.54%. This result is consistent with the classical monetarist view that inflationary pressures are exacerbated by an excess of money if it is not accompanied by corresponding economic output. Bangladesh Bank should therefore make controlling the expansion of the broad money supply its top priority. Careful control of M2 can help prevent demand-pull inflation and excess liquidity in the financial system.

The findings that Net Foreign Assets had a highly significant and negative impact on inflation underscored the significance of a robust external sector. By strengthening the domestic currency and bringing down the cost of imported goods, higher NFA typically the consequence of higher remittances, a positive balance of payments, or the buildup of foreign reserves—can lessen inflationary pressures. Because they serve as buffers against inflation shocks, particularly those caused by changes in the price of commodities globally, this study emphasizes how important it is to maintain steady external inflows and healthy foreign exchange reserves.

A statistically significant inverse relationship between inflation and domestic credit growth suggests that credit expansion during the study period was effectively focused on lucrative economic ventures. This calls into question the widely held belief that an increase in credit inevitably drives inflation by increasing demand from consumers. The findings instead suggest that by directing credit toward investments that boost supply-side capacity, Bangladesh's financial system has stabilized the country. This kind of credit distribution can help boost

economic expansion while containing inflation, underscoring the significance of preserving effective and inclusive banking procedures.

Although M1 Growth and Reserve Money both displayed coefficients in the anticipated directions positive for Reserve Money and negative for M1 Growth neither variable was statistically significant. This lack of importance might suggest that other concurrent monetary policies, like open market operations or liquidity absorption mechanisms, offset their impact on inflation. It could also indicate a change in the velocity of money or a change in the makeup of money holdings. These indicators are important for overall liquidity management and should be monitored even though they were not statistically significant in this study.

The GDP In line with the economic theory that increasing output can counteract inflationary pressures, growth and inflation had a negative relationship. However, this relationship was not statistically significant, indicating that GDP growth may not have had a significant direct effect on price levels during the period under study. It also suggests that supply-side growth may not have been sufficient to offset the inflationary impacts of monetary expansion or external price shocks.

All things considered, the findings demonstrate how important monetary policy is in influencing Bangladesh's inflation dynamics. M2, Net Foreign Assets, and domestic credit growth are some of the key instruments the central bank uses to keep inflation under control. Even though conventional instruments like M1 and Reserve Money are still crucial for operational control, their slight influence during the study period necessitates better coordination with macroeconomic policies and larger monetary aggregates. These realizations are essential for creating more focused and successful policy interventions that strike a balance between sustainable economic growth and inflation control.

CONCLUSION AND POLICY RECOMMENDATION

The study analyzed the extent to which different aspects of monetary policy affect inflation in Bangladesh over the period 2015 to 2024. The main goal was to find out if there is any significant impact contributed by such variables as money supply, foreign exchange reserves, credit, and overall economic growth to rising prices in the country. By examining six major indicators, M1, M2, Reserve money, Net foreign assets, Domestic credit growth, and GDP we were able to have a better idea of what drives inflation in Bangladesh. One of the responses with the greatest importance is that an increase in M2, or broad money supply, directly corresponds to rising inflation. That is, when there's too much money floating around with too few products and service to fill the orders, prices go up. This demonstrates how imperative it is to regulate the amount of money in the economy with great care. On the other hand, Net foreign assets were found to be helping decrease inflation. With a surge in foreign exchange entering the country such as from remittances or exports it becomes easier to regulate prices because the local currency stabilizes and imports become less expensive. Yet another important finding is that domestic credit growth has helped to contain inflation. This might at first glance look counterintuitive, but it is logical when we understand that credit is used for supporting business and productive sectors of Bangladesh. When credit is used in the production of goods and services, it helps to balance the demand, which in turn keeps the prices from going up too quickly. However, not all of the indicators exerted a meaningful impact. Variables like M1, reserve money, and GDP growth were not found to have a meaningful influence on inflation during this period. This does not mean they do not have any bearing, but that it might be limited or mixed up with other economic factors that were not considered in this study.

The study suggests that monetary policy can play an effective role in curbing inflation, but only with caution. Increasing money supply or credit without thinking is not a good idea. Keeping high foreign reserves and making sure that credit flows to productive areas of the economy can even play a huge role in keeping inflation in check. Based on these observations, several suggestions can be made. The Bangladesh Bank must be careful not to let the Broad money supply grow too quickly. If there is excess money compared to goods, prices rise. Money growth should match the economy's actual growth. Second, additional effort has to be directed to building foreign reserves. Encouraging more remittances, greater exports, and carefully controlled imports can all help in a stronger nation position in foreign currency, which can then help in keeping inflation in check. Third, credit has to be utilized by industries producing commodities actually, like agriculture, factories, and infrastructure. This kind of credit generates employment and commodities, which helps the economy as well as price stability. Fourth, the central bank must continue to hone its tools and decision-making framework. The use of superior

data, stronger projections, and improved communication can allow inflation to be brought under control better. It is also extremely important that monetary policy and government spending are coordinated. If the central bank is trying to curb inflation while the government is overspending, their respective efforts may counteract each other. Coordination between branches of the government is essential. Lastly, the study suggests where future research might be useful. For instance, exploration of how far in advance of a resulting effect on inflation an effect from a policy can be observed may be more enlightening. Including external factors like oil prices or movements in other countries' interest rates would give a still richer picture. Future research may also utilize other types of models that can detect shifting relationships over time.

In conclusion, it is clear in this study that the monetary policy of Bangladesh does have a real impact on inflation, especially through controlling money supply and foreign exchange reserves. With better coordination and planning, monetary tools can be used more effectively to ensure price stability and ease the economic growth of the nation.

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APPENDIX

	Y	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**
Period	Inflation	M1	M2	Reserve Money	Net Foreign Assets	Domestic Credit Growth	GDP
Jan-Jun 2015	6.4	14.07	12.4	14.3	21.3	10.1	6.5
Jul-Dec 2015	6.2	13.53	13.8	14.4	26.3	10.3	6.6
Jan-Jun 2016	5.92	22.82	16.3	30.1	22.8	14.8	7.1
Jul-Dec 2016	5.8	32.1	13.8	18.5	19.6	12.3	7.2
Jan-Jun 2017	5.45	22.55	11.7	16.3	12.5	11.3	7.24
Jul-Dec 2017	5.7	13	10.7	10.7	0.5	14.5	7.28
Jan-Jun 2018	5.78	9.55	9.2	4	-4.2	14.6	7.65
Jul-Dec 2018	5.54	6.1	9.4	8.2	-0.3	13.3	7.86
Jan-Jun 2019	5.48	6.65	9.9	5.3	2.2	12.3	8.13
Jul- Dec 2019	5.65	7.2	12	6.9	1.9	15	8.15
Jan-Jun 2020	5.47	13.7	12.7	15.7	10.2	13.7	5.2
Jul-Dec 2020	5.69	20.2	14.3	21.3	30.4	9.7	5.2
Jan-Jun 2021	5.56	17.35	13.6	22.4	27.1	10.3	6.1
Jul-Dec 2021	6.05	14.5	9.6	6.5	2.8	12.4	6.07
Jan-Jun 2022	7.56	13.91	9.4	-0.3	-11.9	16.2	6.5
Jul-Dec 2022	8.71	13.32	8.4	17.4	-22.6	15.1	7.1
Jan-Jun 2023	9.74	14.41	10.5	10.5	-23.4	15.3	5.78
Jul-Dec 2023	9.41	15.49	8.6	-2	-21.8	11.6	6.07
Jan- Jun 2024	9.42	8.67	7.7	7.9	-17.1	10	6.12
Jul- Dec 2024	10.89	1.84	7.6	7.3	-15.7	9.4	6