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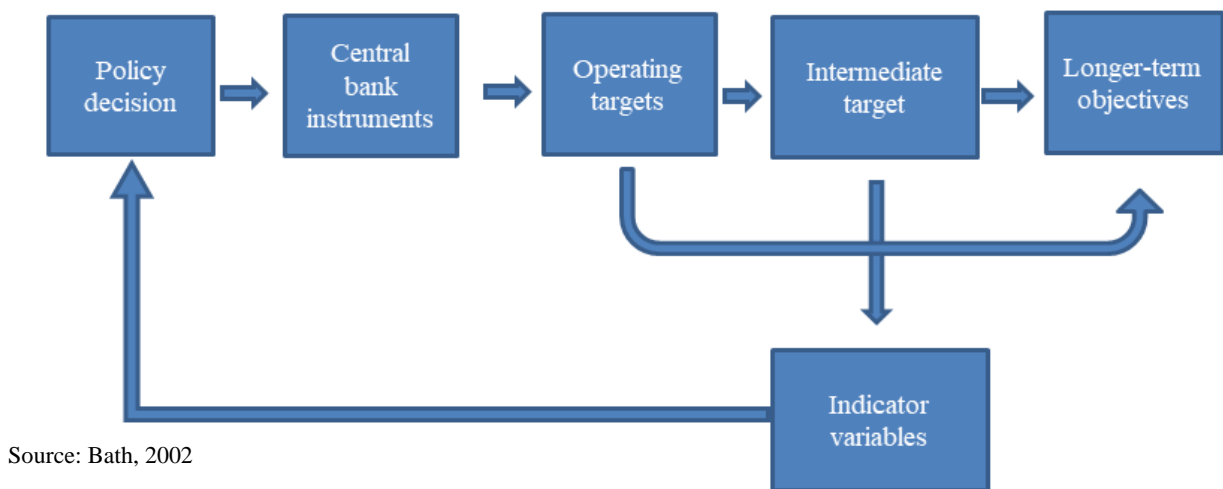
Abstract

This research investigates how changes in monetary policy impact Pakistan's economic growth. trajectory, focusing on macroeconomic indicators and monetary policy's role in long-term economic objectives. The research uses a quantitative approach and econometric methods to evaluate data from 1991 to 2020. Results show that certain variables, like interest rates, capital formation, labor force, and current account balance positively impact economic growth, while others, like exchange rates, net trade, money supply, and private sector access to domestic credit, have negative impacts. These statistically significant correlations show how monetary policy variables and economic outcomes interact in complex ways.

Keywords: Economic growth, Macroeconomic indicators, Monetary policy

1. Introduction

Targets for monetary policy are essential in achieving long-term policy objectives. Targets can be categorized into operating targets and intermediate targets. Intermediate goals, such as long-term interest rates and money stock, act as intermediaries between policy objectives and the instruments used. Operating targets are short-term tactical goals influenced by central bank actions, which indirectly affect intermediate variables. Intermediate targets provide essential indications of overall demand and inflationary pressures. Goals for monetary policy decisions take into account GDP's measurability, control, and predictability, guiding the choice between the money stock and interest rate. Employing intermediate targets allows for quicker adjustments in response to shocks; however, the effectiveness of such targets depends on empirical evidence and the evolving nature of the financial system. Operating targets should align with the chosen intermediate targets or establish a direct link to the ultimate objectives to ensure coherence and effectiveness in monetary policy (Barth, 2002).



Source: Bath, 2002

Figure-1 Process of Monetary Policy Implementation

Monetary policy has evolved, with its significance growing after the 1920s when it became crucial for stabilizing prices and output. However, flawed practices by the Federal Reserve, such as the actual bills doctrine and a less credible gold standard, led to the Great Contraction of 1929-33. In the 1950s, monetary policy was reintroduced in the United States but was still influenced by the actual bills doctrine, possibly contributing to high inflation. The Bretton Woods system tied the global economy to the United States through fixed exchange rates. Since the 1990s, many countries have emphasized price stability based on a credible nominal anchor, following principles from the gold standard era and considering Wick Sell's distinction between real and nominal interest rates. However, modern monetary policy operates under a fiat regime, relying on central banks' commitment to credible and predictable policies (Bordo, 2010). Strong and adverse effects on output result from contractionary monetary policy while stabilizing inflation in the short term. However, it produces a strongly persistent negative effect on actual equity prices. The impulsive responses are robust compared to other identification techniques (Mallick & Sousa, 2012). Mechanisms of money creation and selection of monetary instruments to stimulate economic growth without inflationary consequences the new approach proposed includes controlling the money supply as the vital instrument, money supply growth link to the growth of real GDP, and maintaining a steady and low long-term interest rate to sustain velocity stability (Dimitrijevic & Lovre, 2013). Since the financial crisis, policymakers and the public have relied on the Fed to promote financial stability and economic prosperity. The Fed cannot avoid every recession or calm every financial crisis: Central banks get too much credit and blame.

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Even with interest on reserves and enormous bank reserve account balances, the Fed controls the long-term price level. Because economies develop best under monetary stability, the Fed does help boost economic growth. Low and steady inflation is central bankers' greatest contribution to economic prosperity (Lacker, 2014)⁴. The existing monetary policy will unavoidably result in a recession even with strict regulation of the money. However, it will never uphold the aim of Islam. The interest rate makes a negative contribution to economic growth. So, alternative monetary policies should be considered to maintain economic stabilization (Putriani & Prastowo, 2015). The unconventional tools provide additional scope for monetary policy, but existing frameworks may prove insufficient to offset a severe economic slowdown without reliable fiscal support (Ben, 2017). In emerging nations with structural faults and immature financial sectors that need deeper integration into global markets. The competitiveness and scale of the banking industry, the monetary system, and the degree of economic flexibility are important factors that help to explain how economic growth and monetary policy interact. (Twinoburyo & Odhiambo, 2018). To maintain the stability in the supply of money, interest rates, and financial markets for steady inflation, the central bank employs a variety of tools referred to as monetary policy. The State Bank of Pakistan (SBP) is in charge of formulating and carrying out Pakistan's monetary policies. The SBP Act's Preamble states that monetary policy should ensure monetary stability and make maximum use of the economy's resources for production (SBP, 2018)⁵. In Pakistan's monetary policy, SBP has different goals. After the financial crisis of 2007-2009, the choice of these objectives became more significant. Typically, textbooks concentrate on monetary policy goals from the perspective of emerging nations but the degree of total economic growth of the nation should be taken into account while choosing the goals (Mazhar & Rehman, 2021). Pakistan's economy faces long-standing challenges of slow growth, unemployment, and high debt. Governments sought International Monetary Fund (IMF) support, leading to ineffective policies and persistent deficits. The government should prioritize self-reliance, control deficits, and leverage internal expertise. COVID-19 further impacted the economy, but the government took measures to minimize its effects. The focus now is on economic recovery and growth (Khan, 2021). In such a scenario, a significant role is played by monetary policy in managing these difficulties and encouraging economic growth. Monetary policy is used by central banks to stabilize economies by managing fluctuations and maintaining low and stable inflation. They set explicit inflation targets in many advanced economies and developing countries. Open market operations adjust the money supply by buying or selling securities, influencing short-term interest rates and economic activity. Lowering interest rates eases monetary policy while raising rates tightens it (International Monetary Fund, 2023)⁶.

This research examines numerous factors that affect monetary policy effectiveness on economic growth. An investigation will particularly focus on the monetary impact from Pakistan's perspective. The investigation will begin by reviewing the existing literature and examining the theoretical framework and empirical evidence. Furthermore, the examination will contribute to the body of knowledge and provide suggestions to decision-makers to make monetary policy more successful in fostering economic stability and expansion.

2. Literature Review

Inflation and growth in the money supply are closely related. The real GDP was affected in the first round, while inflation was affected in the second by the money supply in Pakistan. Pakistan's inflation has increased significantly as a result of excessive money supply growth. Possibly the reason is SBP's loose monetary policy, which highlights the importance of the growth target but a significant policy implication is that Pakistan's inflation can be controlled with a suitably strict monetary policy (Qayyum, 2006).

The effect on GDP growth, however, differs from expectations when the exchange rate and supply of money are used together as monetary instruments if the rate of interest rate is considered a monetary variable, an upward adjustment in the interest rate results in both GDP growth and inflation falls as well as an increase in the exchange rate. GDP growth stays consistent with expectations after a contractionary policy shock reflected by GDP stays unchanged despite money and exchange rate increase, rise in money growth causes a rise in interest rate. When inflation responds to money supply variations, it does so more quickly than GDP expansion. Exchange rate appreciation regularly results in higher GDP growth. (Amarasekara, 2008).

The GDP, Pakistan's consumer price index (CPI), and the money supply (M1) have a steady long-term relationship. The Pakistani monetary authority must devise plans that seek balanced growth in the supply of money to ensure stable prices in the long term. A sound economy will be helped by this kind of monetary policy, which will then make it easier for economic actors to make decisions. Furthermore, monetary policy seems to be quite successful in the short term, with the supply of money serving as a regressor factor that has a major impact on changes in the price level and, as a result, GDP (Waliullah & Rabbi, 2011).

The tightening of monetary policy, which is indicated by a rise in interest rate, has a considerable adverse effect on production. While, the link between the GDP and money supply is strongly positive, showing that greater levels of money supply cause higher levels of inflation and higher levels of output. Exchange rates can harm production. It is important to remember, nevertheless, that a favorable interest rate shock is the result of tightening monetary policy, which often results in persistent inflation. It contradicts the widespread belief that tighter monetary policy should cause prices to decline (Hameed et al., 2012).

When macroeconomic factors including interest rates, inflation, and exchange rates were compared to GDP, they were shown to be strongly positively correlated. However, only 44% of fluctuations in Ghana's GDP could be attributed to inflation and interest rates. To achieve the reduction and stabilization of economic indicators like inflation targets and rate of interest, the government and the Central Bank of Ghana advance and execute sound monetary policies (Agalega & Antwi, 2013).

⁴ richmondfed.org/-/media/RichmondFedOrg/press_room/speeches/president_jeff_lacker/2016/pdf/lacker_speech_20160224.pdf

⁵ <https://www.sbp.org.pk/70/sup-12.asp>

⁶ imf.org/en/About/Factsheets/Sheets/2023/monetary-policy-and-central-banking

The effectiveness of money super neutrality, and endogenous fertility controls both the optimum monetary policy as well as the transitional aspects of monetary policy forecasting. Monetary growth raises reproduction on a path of balanced growth while the reducing rate of economic growth of consumption and maintaining precise balances may work either independently or together. However, if precise balances and increased spending are substituted for fertility, monetary expansion may cut fertility while boosting economic growth (Chang et al., 2013).

Even though monetary policies have contributed significantly over the years, the limits of the policy instruments, which restrict their ability to contribute to growth, are responsible for their inability to effectively achieve their policy goals. The real and nominal effects on economic indicators are dependent upon the selected policy variable in the context of monetary adjustments (Fasanya et al., 2013).

Pakistan's high inflation rate is mostly caused by an SBP's excess of the money supply (M2) which is harming the country's economy. Regression analysis shows that interest rates and CPI significantly correlate with Pakistan's GDP. However, the inflation rate does not significantly correlate with the country's GDP. Implementing aggressive control measures on the money supply is crucial to stimulating economic growth. It is crucial to regulate the money supply because an excessive supply often leads to inflationary pressures (Ihsan & Anjum, 2013).

Monetary policy actions have limited effectiveness during periods of high economic growth, whereas they significantly affect output during periods of low growth. It was shown that whereas big shocks do not substantially explain changes in the temporary component of output, small monetary policy shocks have an identifiable impact on production. Additionally, it is said that output is not impacted by positive increases in the supply of money, but is impacted by negative changes (Zakir & Malik, 2013).

Real GDP and the money supply variables are positively correlated. However, only the correlation between M1, M2, and real GDP is significant. Make a case that Malaysia's expanded supply of money benefits long-run production, especially the country's GDP. To facilitate sustainable long-run real GDP growth, Bank Negara Malaysia may choose to adopt an expansionary monetary policy (Khin et al., 2014).

For an economy to remain healthy, monetary policy's stabilizing effect is essential. However, it has been shown that changing monetary policy via variables like money availability and repo rates has an insignificant impact on economic growth. All factors have a favorable impact on GDP, but only inflation stands out. As a result, the government undertakes other policies in addition to monetary policy to promote economic growth. These actions might include, among other things, raising expenditure in the productive sector and encouraging FDI to boost domestic investment (Precious & Palesa, 2014).

In Pakistan, monetary policy significantly impacts economic growth, and the monetary authorities can influence money supply changes. Contractionary monetary policy, however, is ineffective in promoting economic expansion. Research also found that actual exchange and interest rates significantly influence GDP, while money supply and domestic inflation do not (Anwar et al., 2016).

Changes in economic activity and a person's propensity to hold money for non-productive purposes may have impacted the money supply. However, despite these factors, the findings reveal that the money supply significantly impacts macroeconomic variables, proving its effectiveness in controlling output (Nwoko et al., 2016).

The key monetary tool interest rate has an enormous and favorable effect on the sector and national economic growth. Utilizing unconventional monetary policy tools to keep inflation under control and encourage growth in three sectors of the economy hurts inflation. Analysis shows that monetary policy changes have adjustments that are lessened throughout crises and strengthened by increases in bank lending (Guenichi & Khalfaoui, 2019).

Economic activity is symmetrically impacted by monetary policy shocks, which rely on the well-being of the economy. Economic activity is significantly impacted by shocks to monetary policy during recessions and slow credit expansion. It suggests that while formulating monetary policy, decision-makers take the status of the economy and credit cycles into account in order to attain the intended economic results (Tunc & Kilinc, 2019).

Economic growth is favorably impacted by monetary policy, but only to a maximum extent of 3% and 7%, respectively, for the monetary policy rate (MPR) and supply of broad money (M2). There is a need for more tools to augment the good inflation targeting (IT) framework for monetary policy (Musa et al., 2022).

Economic growth is significantly influenced by monetary policy. A monetary policy expansion results in a lower rate of interest, more robust overall lending, and price hikes. However, expansionary monetary actions are harmful to economic growth (Srithilat et al., 2022).

3. Monetary Policy Implementation in Pakistan

3.1. How does monetary policy operate?

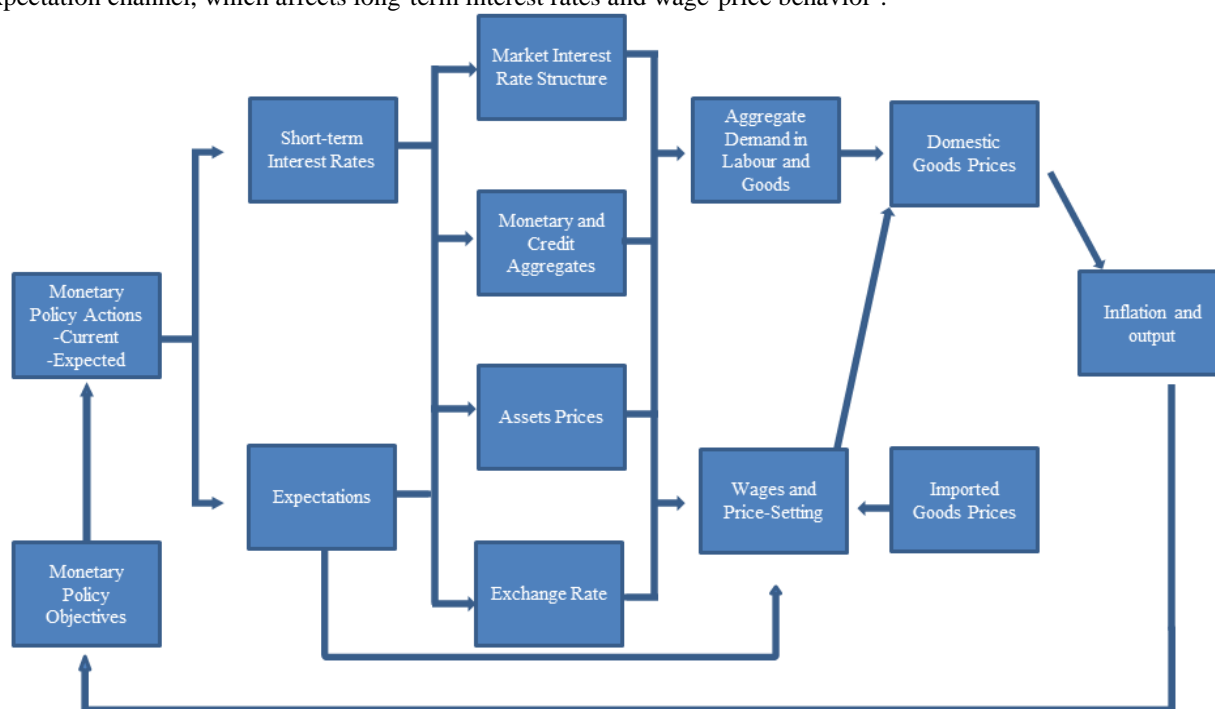
Through adjustment to the policy rate, the SBP conveys its stance on monetary policy. Policy rate changes affect the economy through channels, including interbank market interest rates and consumer and commercial borrowing costs. Higher rates encourage saving, whereas lower rates stimulate investing and consumption. Changes in policy rates have an impact on people's wealth, asset prices, and consumption. In the end, changes in demand have an impact on the economy's total price level and inflation⁷.

3.2. Mechanism for Transmitting Monetary Policy

Inflation and total demand are impacted by monetary policy changes via a process known as the "transmission mechanism." It operates via five channels: the rate of interest, balance sheet, exchange rate, asset price, and expectation channel. KIBOR (Karachi Interbank Offer Rates) and repo are channels of interest rates, which determine the interest rate in the long run, and affect borrowing costs for individuals and companies, influencing their choices to spend, save, and invest. Credit availability and the

⁷ www.sbp.org.pk/m_policy/About.asp

financial situation of the economic agent are both affected by the balance sheet channel. Through differences in interest rates, the exchange rate channel connects the local and global economies. The price for real and financial assets is influenced by the asset price channel, which affects effect on wealth and spending. Future interest rate and inflation expectations are influenced by the expectation channel, which affects long-term interest rates and wage-price behavior⁸.



Source: SBP

Figure-2 Illustration of the Monetary Policy Transmission Mechanism

A robust monetary management approach is essential to reduce the government's reliance on central bank borrowing, address monetary pressures resulting from increased capital flows, and maintain manageable refinancing levels. While maintaining a strict monetary policy, the SBP could improve communication to influence inflation expectations. The SBP initiates preparatory measures for implementing inflation targeting and establishes a supportive legal and regulatory framework that enables inflation targeting and grants the central bank greater operational independence. Furthermore, effective monitoring and controlling food prices is crucial for successfully curbing them (Governor SBP, 2007)⁹.

3.3. The Economic Performance of Pakistan: An Overview

Inflation in Pakistan has been volatile, ranging from single digits to more than 20 percent. High inflation in some years, such as 2008¹⁰ and 2019¹¹ could erode purchasing power and affect the cost of living for households. The money supply has fluctuated significantly, especially in the early 1990s and mid-2000s, and increased from 39% of GDP to 54.9% from 1991 to 2020. GDP growth has also been volatile, with some years seeing strong growth rates, such as 1992, 2004, and 2018, but some other years experiencing slower growth or even negative growth, as seen in 2020. Moreover, GDP increased dramatically from 45.6 to 300.4 billion USD from 1991 to 2020 (World Development Indicators, 1991-2020).

Figure-3 Inflation, Consumer Price (annual %)

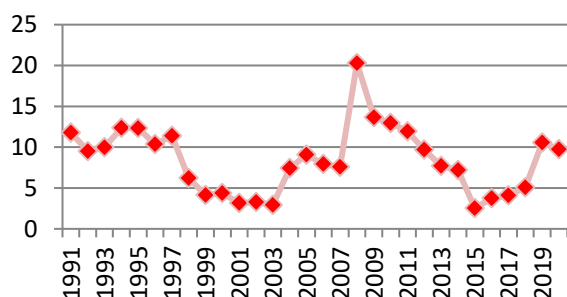
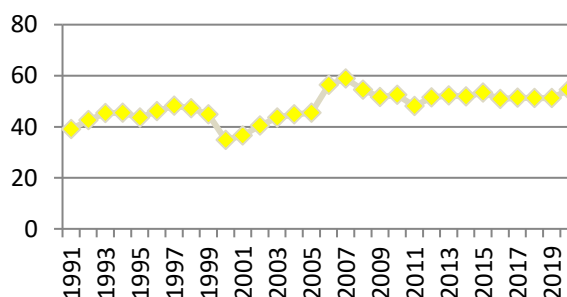


Figure-4 Money Supply Growth (% GDP)



⁸ www.sbp.org.pk/m_policy/mp-imp-02.asp

⁹ sbp.org.pk/about/speech/governors/dr.shamshad/2007/FPCCI-26-Nov-07.pdf

¹⁰ In 2008, the world experienced one of the most significant economic crises (the Great Recession). www.issi.org.pk/wp-content/uploads/2014/06/1302497247_37103097.pdf

¹¹ In 2019, the world experienced a coronavirus disease (COVID-19) that slowed global economies. [https://ead.gov.pk/SiteImage/Misc/files/EAD_Covid-19%20Impact%20on%20Pakistan's%20Economy%20\(27_04_2020\)\(1\).pdf](https://ead.gov.pk/SiteImage/Misc/files/EAD_Covid-19%20Impact%20on%20Pakistan's%20Economy%20(27_04_2020)(1).pdf)

Figure-5 GDP Growth (annual %)

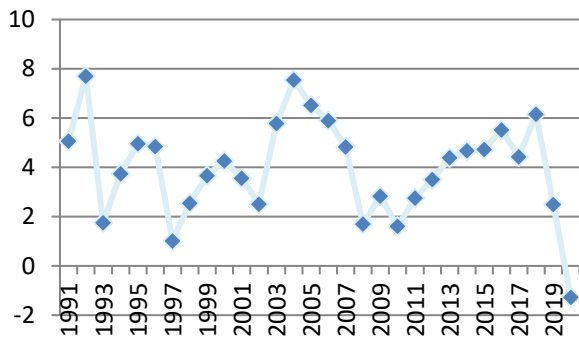
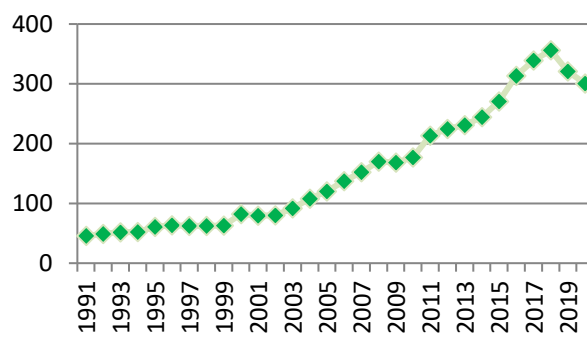


Figure-6 GDP (Billion US \$)

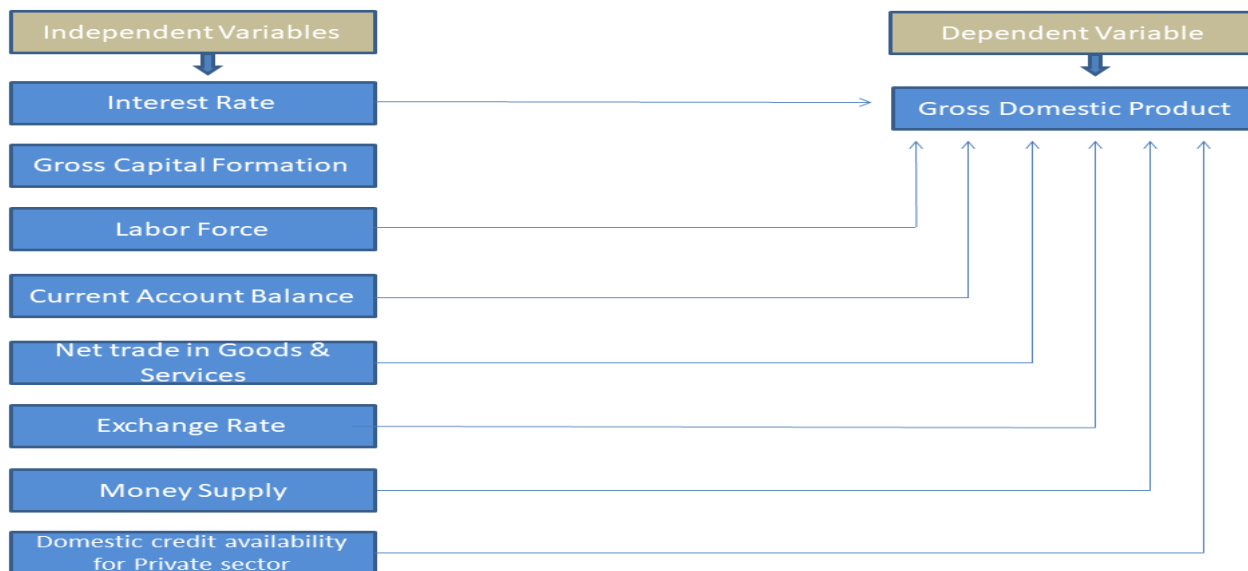


Source: Author's Illustrations

4. Methodology

The study will examine multiple variables influencing monetary policy and its impact on economic growth using the quantitative approach that analyzes numerical time series data to identify impacts. The quantitative approach is suitable for studying; it allows the use of econometric tools and techniques to analyze the collected data.

4.1. Theoretical Framework



Source: Author's illustration

Figure-7 Theoretical Framework

4.2. Model Specification

$$GDP_t = \beta_0 + \beta_1 IR_t + \beta_2 GCF_t + \beta_3 LF_t + \beta_4 CAB_t + \beta_5 NX_t + \beta_6 EX_t + \beta_7 MS_t + \beta_8 DCPS_t + \epsilon_t$$

Where:

- GDP is a dependent variable.
- Interest rate (IR), Gross capital formation (GCF), Labor force (LF), Current account balance (CAB), Net trade in goods and services (NX), Exchange rate (EX), Supply of money (MS), and private sector's access to domestic credit (DCPS) are independent variables. Data has been collected from WDI for (1991-2020).
- The coefficients $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7,$ and β_8 are independent variables that show influence on the dependent variable.
- Error term ϵ shows unexplained variance by model.

The goal is to estimate the $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7,$ and β_8 through Ordinal Least Squares (OLS) regression by using collected data. OLS allows quantifying the monetary policy impact on GDP by estimating coefficients for variables. It handles multiple variables and offers interpretable coefficients.

| Variable | Description |
|----------|-------------------------------|
| GDP | GDP per capita in current USD |

| | |
|------|--|
| IR | Annual interest rate in percentage |
| GCF | Gross capital formation in current USD |
| LF | Labor force, total |
| CAB | Current account balance (balance of payments) in current USD |
| NX | Net trade of goods and services (balance of payments) in current USD |
| EX | Official exchange rate (average over a period, local currency unit to USD) |
| MS | Broad money growth annually in percentage |
| DCPS | Private sector's excess to domestic credit (% of GDP) |

4.3. Hypothesis

Null hypothesis (H_0), the relationship between each of the independent variable and GDP is insignificant. The relevant regression coefficients are not equal to zero, supporting the alternative hypothesis (H_1) according to which there is a significant relationship.

4.4. Data Collection and Analysis

The data is gathered from secondary sources throughout the last 30 years, from 1991 to 2020.

Table-1 Regression Analysis

| Variables | Coefficient | t-Statistics | p-Values |
|--|-------------|--------------|----------|
| Interest rate | 6.262818 | 2.861229 | 0.0093 |
| Gross capital formation | 1.91E-08 | 7.125708 | 0.0000 |
| Labor force | 5.32E-06 | 2.936320 | 0.0079 |
| Current account balance | 1.45E-08 | 3.501087 | 0.0021 |
| Net trade in goods and services | -1.42E-08 | -4.477501 | 0.0002 |
| Exchange rate | -2.275465 | -4.928512 | 0.0001 |
| Money supply | -1.607804 | -2.268733 | 0.0339 |
| Private sector's access to domestic credit | -7.240655 | -3.054167 | 0.0060 |
| C | 211.9177 | 3.804781 | 0.0010 |
| R-squared | 0.997992 | | |
| Adjusted R-squared | 0.997228 | | |

Source: Estimated by Author

Using the data that has been gathered, regression analysis is conducted between the independent and dependent variables. It demonstrates how much of an impact each independent variable has on the GDP. We examined the Ordinal Least Squares (OLS) regression to analyze independent variable coefficients. When all other variables are held constant, the coefficients show the estimated one unit change in the independent variable changes the proportion in the dependent variable.

Analysis shows that one unit change in interest rate is estimated to be a 6.26 unit change in economic growth and is statistically significantly influenced favorably by interest rates. For one, unit change of gross capital formation is estimated to be 1.91E* -08 unit changes in economic growth are statistically significantly influenced favorably by gross capital formation. Similarly, one unit change in the labor force is estimated to be 5.32E*-06 and one unit change in the current account balance is estimated to be a 1.45E*-08 unit change in economic growth both factors have a statistical significance and favorable effect on economic growth. A unit change in net trade in goods and services is estimated to be 1.42E*-08 unit change in economic growth and has an adversely statistically significant impact. Similarly, a unit change in the exchange rate is estimated at 2.28, a unit change in money supply is estimated to be 1.61, and a unit change in the private sector's access to domestic credit is estimated to be a 7.24 unit change in economic growth. The exchange rate, money supply, and the private sector's access to domestic credit all impact economic growth in statistically significant ways. Alternative hypotheses are accepted since all variables seem significant (p 0.05) and are all at a 5% significance level.

The model's constant term (c) represents the estimated economic growth with a value of 211.92 when all independent variables are zero. The R-squared shows approximately 99.8% of the economic growth variations have been explained by the model.

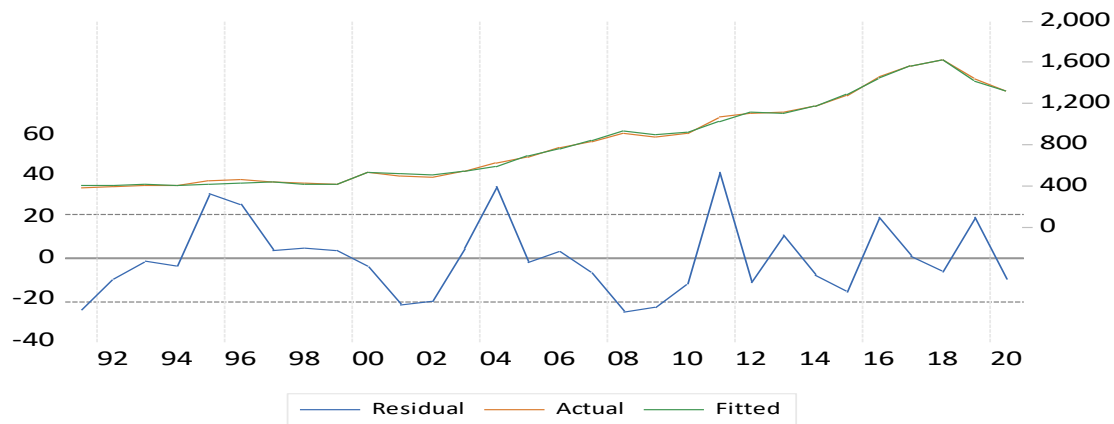
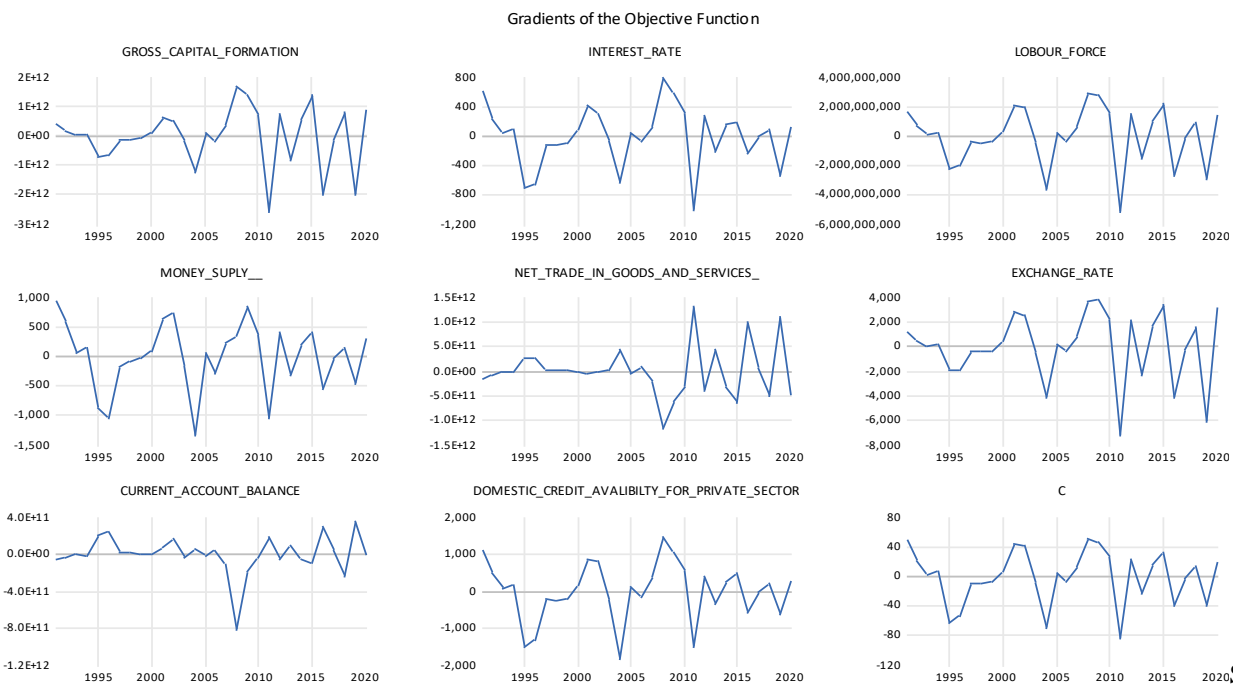


Figure-8 Residual, Actual and Fitted Graph



Estimated by Author

Figure-9 Gradients of Objective Function

5. Conclusion and Recommendation

For long-term goals to be accomplished, monetary policy targets are essential. The commitment of central banks to credible and predictable programs is essential to modern monetary policy. A novel strategy is managing the money supply, linking it to GDP growth, and preserving a low long-term interest rate but poorly implemented monetary policy may have negative growth impacts that linger for a very long time. Using secondary data from 1991 to 2020, this study analyzes the impacts of interest rates, gross capital formation, labor force, current account balance, net trade in goods and services, exchange rate, money supply, and the private sector's access to domestic credit on GDP as well as the factors influencing its effectiveness. The findings demonstrate that the labor force, current account balance, gross capital formation and interest rate have a positive influence on economic growth. Economic growth is negatively impacted by exchange rates, net trade in goods and services, the money supply, and the private sector's access to domestic credit. Alternative hypotheses are accepted in the investigation at a 5% significance level.

It suggests that Policymakers should sustain economic growth without inciting inflationary pressures; a balanced strategy is required. The central bank should maintain a stable interest rate environment to provide certainty to businesses and investors. Avoiding frequent fluctuations in interest rates will support long-term investment decisions and economic growth. Monitoring and controlling exchange rates, particularly in international commerce, may reduce the negative impacts on economic growth. A flexible money supply, prudent regulation, and a long-term policy vision are essential for maintaining economic stability and fostering confidence and sustainable growth. Business expansion and investment may be aided by ensuring that the private sector can access sufficient financing while avoiding over-borrowing. To properly control inflation expectations, the central bank should communicate its monetary policy actions clearly and transparently. To obtain the best possible economic results, monetary and fiscal policies should be well coordinated. To ensure growth and stability, policymakers should use a flexible strategy to modify monetary policy as economic circumstances change.

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