

# Impacts of Monetary and Fiscal Policies on Price and Currency Stability in Bangladesh

*Bangladeř'te Para ve Maliye Politikalarının Fiyat ve Döviz İstikrarı Üzerindeki Etkileri*

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## ABSTRACT

**Keywords:**  
Money Supply,  
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**Jel Codes:**  
C32 E31 E63 F31

*This study investigates the effect of monetary and fiscal policies on inflation and exchange rate in Bangladesh in light of recent high inflation and the currency crisis. The analyses employ data from 1991 to 2022 to examine the ability of monetary and fiscal policies to stabilize the economy by managing inflation and currency fluctuations. The ARDL bounds test approach is utilized to estimate the empirical relationships of the model specification from both monetarist and Keynesian perspectives. The study's findings reveal that monetary and fiscal policies significantly impact inflation management, with monetary policy playing a more substantial role. The empirical relationship emphasizes that an increase in money supply and government spending positively affect inflation, with money supply having a greater impact on controlling domestic prices. Nevertheless, the study does not provide evidence that monetary and fiscal policies significantly influence exchange rate stabilization. The research indicates that enhancing the export sector, raising the amount of remittance inflows, reducing import reliance by promoting domestic production, prioritizing the reduction of fiscal reliance on monetary policy, and implementing a market-oriented exchange rate mechanism can aid in maintaining economic stability in terms of prices and currency. These outcomes provide valuable insight into the effectiveness of monetary and fiscal policies in stabilizing the economy and offer relevant policy implications for policymakers in Bangladesh.*

## ÖZET

**Anahtar Kelimeler:**  
Para Arzı,  
Devlet Harcamaları,  
Enflasyon,  
Döviz Kuru,  
Bangladeř  
**Jel Kodları:**  
C32 E31 E63 F31

*Bu çalışma, Bangladeř'te son dönemde yaşanan yüksek enflasyon ve döviz krizi ışığında para ve maliye politikalarının enflasyon ve döviz kuru üzerindeki etkisini incelemektedir. Analizlerde, para ve maliye politikalarının enflasyonu ve döviz dalgalanmalarını yöneterek ekonomiyi istikrara kavuşturma yeteneğini incelemek için 1991'den 2022'ye kadar olan verilerinden yararlanılmıştır. ARDL sınır testi yaklaşımı, model spesifikasyonunun ampirik ilişkilerini hem parasalcı hem de Keynesyen perspektiflerden tahmin etmek için kullanılmıştır. Çalışmanın bulguları, para ve maliye politikalarının enflasyon yönetimini önemli ölçüde etkilediğini, para politikasının ise daha önemli bir rol oynadığını ortaya koymaktadır. Ampirik ilişki, para arzındaki ve hükümet harcamalarındaki artışın enflasyonu olumlu yönde etkilediğini, para arzının yurt içi fiyatları kontrol etmede daha büyük bir etkiye sahip olduğunu vurgulamaktadır. Ancak çalışma para ve maliye politikalarının döviz kuru istikrarını önemli ölçüde etkilediğine dair kanıt sunmuyor. Araştırma, ihracat sektörünün güçlendirilmesi, işçi döviz girişi miktarının artırılması, yerli üretimi teşvik ederek ithalata bağımlılığın azaltılması, para politikasına mali bağımlılığın azaltılmasına öncelik verilmesi ve piyasa odaklı bir döviz kuru mekanizması uygulanmasının ekonomik istikrarın korunmasına yardımcı olabileceğini gösteriyor. Fiyatlar ve para birimi açısından bu sonuçlar, ekonomiyi istikrara kavuşturmada para ve maliye politikalarının etkinliğine dair değerli bilgiler sağlıyor ve Bangladeř'teki politika yapıcılara ilgili politika sonuçları sunuyor.*

## 1. INTRODUCTION

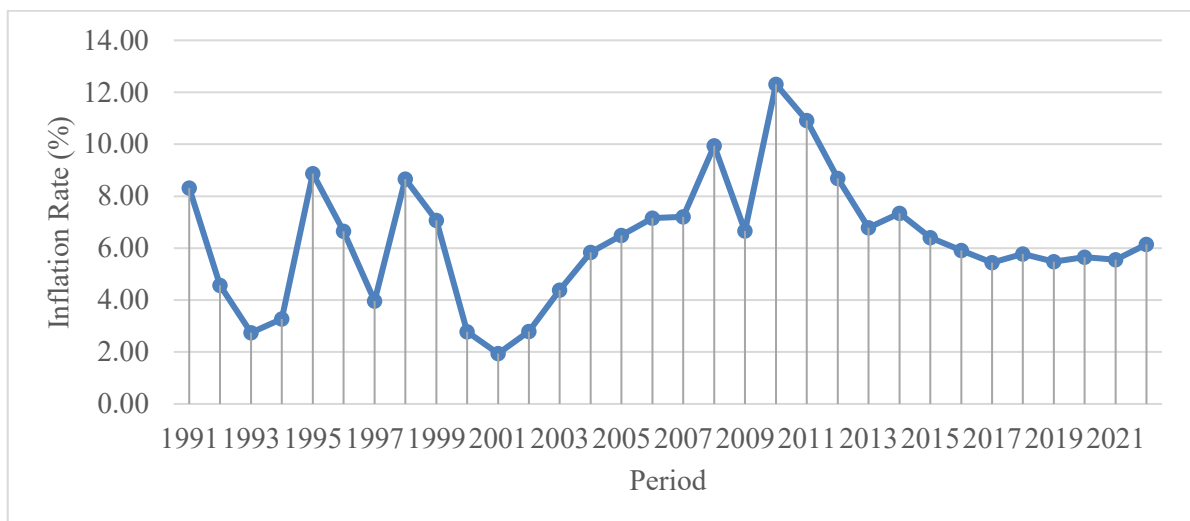
Macroeconomic stability is essential for every country's long-term economic prosperity. Macroeconomic policies, such as fiscal and monetary policy, can help to stabilize the economy during times of crisis, such as currency crises and excessive inflation (Criste & Lupu, 2014; Blanchard & Summers, 2017; Fabris, 2018; Bonam & Lukkezen, 2019). During a crisis, most economies worldwide attempt to alleviate the situation by injecting additional liquidity and lowering interest rates (Brunnermeier, 2009; Cukierman, 2013). The flexibility with which policy interventions are implemented during a crisis depends on the level of monetary policy adoption (Laidler, 2017; Ullao-Suarez, 2023). Many central banks in developing countries aim to maintain low inflation, stable pricing, and long-term production growth (Iddrisu & Alagidede, 2020; Ahiadorme, 2022; Junior et al., 2022). The fiscal authority aims to achieve economic growth using all available budgetary measures (Wang et al., 2023). However, lowering the interest rate through monetary policy occasionally has the potential to undermine the country's currency, and because of the low-interest rate, there is a chance that capital outflow may occur (Cheung et al., 2016; Filardo et al., 2016; Han & Wei, 2018; Tobal & Menna, 2020). In this context, fiscal policy can be employed to control prices and steady economic growth. Because monetary policy is a collection of different policy tools for controlling money inventories to maintain macroeconomic stability, exemplary policy implementation can reasonably limit inflation (Sui et al., 2022; Sleibi et al., 2023). Furthermore, such monetary policy can preserve a healthy balance of payments condition, while well-functioning financial intermediation can support long-term financial and economic development (Sun & Liu, 2023).

During an economic slowdown, on the other hand, fiscal stimulus packages can significantly stimulate domestic demand and keep economic operations on track, restoring economic confidence (Deb et al., 2021). Meanwhile, inappropriate fiscal spending may result in a severe budget deficit that unnecessarily increases the public debt, resulting in a fiscal imbalance (Meier et al., 2021). Any failure to implement policies or poor reactions to policies may cause the economy to suffer for a long time rather than alleviate the crisis. When policy solutions are not sustainable, and the crisis becomes severe rather than being overcome, the economy may suffer greatly, and the recession may be prolonged (Hommes et al., 2018). The ability of fiscal and monetary policy to recover from economic crises such as currency crises and high inflation, as well as the superiority of fiscal or monetary policy in determining which is more proactive in times of economic turmoil, has become a contentious issue (Afonso et al., 2016; Wang et al., 2022; Lemoine & Linde, 2023). It has also been the subject of a long debate, which has yet to be resolved in the research community. Expert groups have opposing views; some argue monetary policy can resolve economic crises and present empirical evidence using a theoretical equation (Ferrando et al., 2022). Other expert groups, on the other hand, argue that fiscal efforts are more effective at resolving economic crises (Woodford & Xie, 2021). Therefore, the question is which is more effective for stabilizing the economy during a crisis: monetary or fiscal policy.

According to Keynesian thoughts, expansionary fiscal policy could be appropriate for firing up aggregate demand with growing output levels due to its greater multiplier effects in crisis mitigation (Keynes, 1936). Monetarists argue that monetary policy should be more aggressive in the short run to stimulate economic agents' behavior to recover from the economic slump (Friedman & Meiselman, 1963; Anderson & Jordan, 1968; Carlson, 1978). They believe that boosting the money stock will positively affect output mobilization. Nevertheless, there is no clear answer as to whether monetary or fiscal policy suits this context (Cavalli et al., 2019; Kocherlakota, 2022). The respective economies should be decided based on the pattern of crises, yet they must have sufficient understanding and forecasting power on the nature of crises to which policies may respond adequately. Furthermore, many studies solely look at the individual function of fiscal or monetary policy in defending the economy during a crisis (Eijffinger & Karatas, 2012). In practice, the combination or proper coordination of these policies, i.e., a set of comprehensive policy mixes, has rarely been identified as how the economy will prepare for future crisis situations by evaluating the past. In developing countries, monetary policy has always been influenced by fiscal counterparts to manage deficit financing, resulting in high inflationary consequences, while the principal mandate of monetary authority has been directly violated to control inflationary pressures (Bianchi & Ilut, 2017; Hur & Lee, 2017; Buyukbasaran et al., 2020; Skott, 2021; Algozhina, 2022). However, the fiscal authorities could also implement policies to mitigate the high inflationary repercussions of efficient fiscal budget control, such as boosting tax income. They must reduce fiscal reliance on monetary policy to fund the budget deficit (Aslanli, 2015; Cabral & Diaz, 2015; Neaime & Gaysset, 2022).

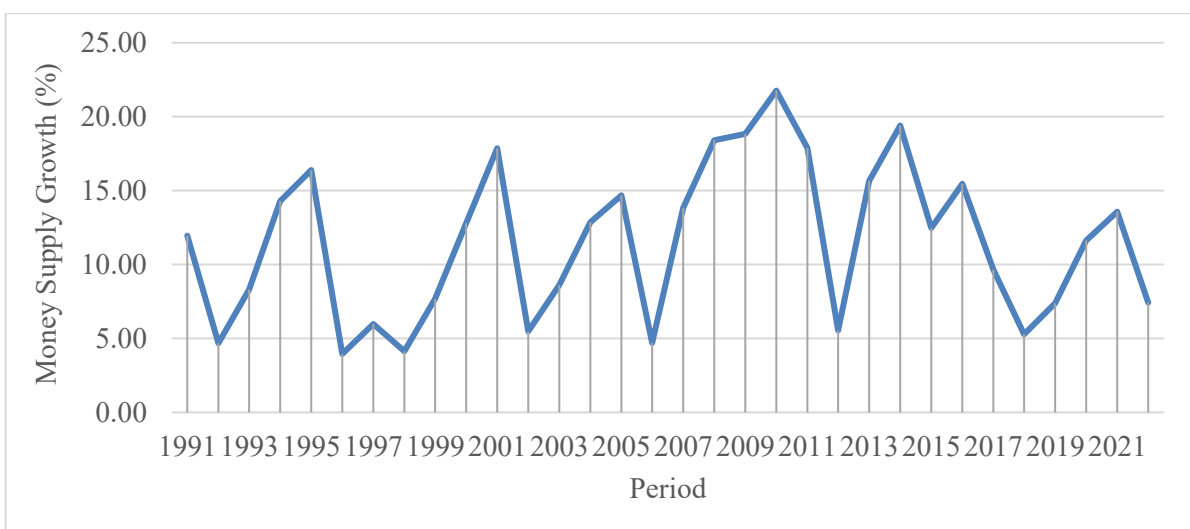
In Bangladesh, the inflation rate reflects a sharp rise or fall in the price of a standard consumer goods and services basket. At the beginning of the new millennium, Bangladesh's economy suffered from a gradual price increase, and then the situation improved, but in recent years, the inflationary pressure has been increasing. Sometimes, increasing food and oil prices in the world market significantly stimulates domestic inflation, limiting developing

or emerging market demand situations. Again, to some extent, market intermediaries charge higher prices, contributing to inflation.



**Figure 1. Inflation Rates of Bangladesh from 1991 to 2022**  
 Source: Bangladesh Bureau of Statistics (BBS)

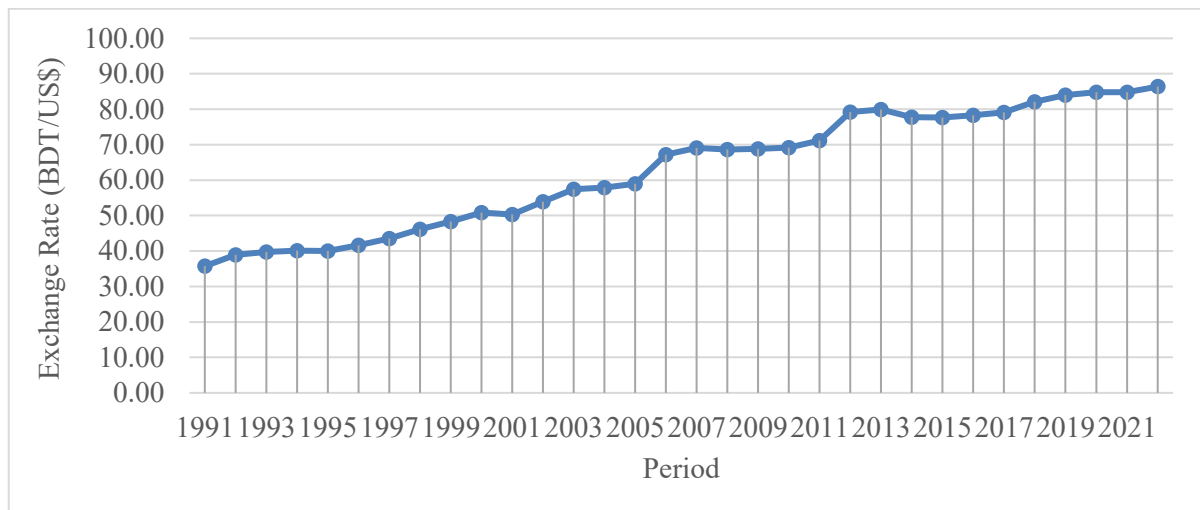
Bangladesh experienced a double-digit inflation rate in 2010. After the global financial crisis in 2008, from 2009-2010, the inflation rate started to shoot up in some developing countries. This upward trend was also observed in Bangladesh. In 2010, the inflation rate was 12.31%, the highest in this period. It is important to note that there was likely a structural break in inflation trends in 2010. On the other hand, the observed period shows a historically low inflation rate (1.94%) in 2001. After 2011 (the inflation rate was 10.92%), the inflation rate started to decline. In 2016, the inflation rate was 5.92%, below 6% for the first time in twelve years. After 2017, the inflation rate started to increase steadily it was 5.44% in 2017, but at the end of 2022, it was 6.15%. Due to the Covid-19 pandemic, the world commodity market, as well as the Bangladesh economy, faced a severe disruption in economic activities. Inflation rates in Bangladesh from 1991 to 2022 are shown in Figure 1 to look at the overall inflationary trend. In Bangladesh, the annual average inflation rate was 6.30%, with large fluctuations during this period. At the same time, the annual average money supply growth was 11.52%, reflecting a lower variation than the inflation rate movement. The yearly money supply growth for the period of 1991 to 2022 is shown in Figure 2.



**Figure 2. Money Supply Growth of Bangladesh from 1991 to 2022**  
 Source: Bangladesh Bank (BB)

For various reasons, the economy, like Bangladesh, has recently experienced a currency crisis and rising inflation. The country’s foreign exchange markets are now in turmoil due to a lack of foreign exchange or diminishing international reserves. This problem also causes the local currency to devalue, limiting the economy’s imports.

The nominal exchange rate movement for the period 1991 to 2022 is shown in Figure 3, which depicts a sharp exchange rate depreciation or devaluation that occurred during this period.



**Figure 3.** Nominal Exchange Rate Movement of Bangladesh from 1991 to 2022  
 Source: Bangladesh Bank (BB)

As a heavily import-dependent economy, exports confront difficulties due to reliance on imported raw materials, and limiting imports of crucial products, such as fuels for energy production, has increased the country’s inflationary pressure excessively. On the other hand, another source of foreign currency gains, remittance inflows, has slowed due to the sender’s use of informal channels, as the economy lacks a stable or distinctive market-based exchange rate. When an economy enters the crisis as Bangladesh is experiencing, monetary policy and fiscal policy actions, implying a genuine policy mix, must be implemented to revive the economy. The active role of monetary and fiscal policy may be required to defend the economy from crises properly. It is critical to evaluate the function of monetary and fiscal policy in overcoming instability when the country is severely entangled in crises such as the currency crisis and the price hike problem. The effectiveness of monetary and fiscal policy must be investigated using empirical evidence to determine which policy actions would be appropriate and to respond quickly to obtain the best comprehensive options for stabilizing the economy in a crisis situation in the shortest time. In times of economic instability, such as excessive inflation and a currency crisis, coordinated monetary and fiscal policy actions could significantly defend the economy during the crisis (Debrun et al., 2021; Bergant & Forbes, 2023).

This study aims to identify the effects of monetary and fiscal policies on economic stabilization during currency crises and periods of high inflation in developing countries such as Bangladesh. This research mainly concentrates on two significant rationales. First, we investigate the effects of fiscal and monetary policies on inflation and the foreign exchange reserve. Understanding the potential consequences of such a program could aid the economy in developing and implementing the optimum policy mix for economic stabilization. Second, this research examines monetary policy’s effectiveness or relative importance over fiscal policy in recovering the economy from the crisis. However, the entire study has been carried out to obtain answers to the two research questions. What are the effects of monetary and fiscal policies on economic stabilization? Is monetary policy more effective than fiscal policy in resolving the currency crisis and excessive inflation? The auto-regressive distributed lag (ARDL) model has been used in the empirical analyses of this study to explore the given research questions since the empirical relationships have been investigated utilizing time series data. The ARDL bounds test approach has basically been implemented to find out the long-run and short-run links between the stated policies and economic agents in stabilizing the crisis.

The following section discusses a comprehensive literature review, part 3 includes methodologies with data and variable descriptions, part 4 discusses empirical results and part 5 includes concluding remarks with policy implications.

## 2. LITERATURE REVIEW

The comparative study of the effectiveness of monetary and fiscal policy on economic stabilization has been acknowledged as an old but comprehensive problem. Various theoretical and empirical research has been added

to this topic to understand the discretionary role of monetary and fiscal policy properly. This literature review will provide insights into comparative facts based on theoretical and empirical evidence. Many studies employing various ideas and approaches to investigate the relationship between government expenditure and economic stabilization have yielded relatively conflicting results, i.e., the conclusions of these studies have concentrated on both positive and negative outcomes. Keynes' general theory demonstrates the credibility that, in times of severe depression, fiscal action can improve economic activity. Evidence from research done by De Leeuw et al. (1969), Schmidt and Waud (1973), and Blinder (1974) also indicates the theoretical and empirical basis for fiscal policy's active engagement in the economy. Monetarist views attempt to establish the monetary role of output by claiming that fiscal policy has little effect on aggregate demand, and the relationship between money and output is established by the influential study from Friedman and Schwartz (1963). This paper also shows that changes in money growth affect production growth, as Walsh (1998) suggested. The causality of money to output will not always happen, as Benjamin Friedman and Kuttner (1992) and Tobin (1970) stated. Benjamin Friedman and Kuttner (1992) discovered an insignificant link between money and income in the United States. Gramlich (1971) summarizes the fiscal and monetary debates studies and highlights that Friedman and Meiselman (1963) focus on consistent results for money and output linkages compared to studies of output and government spending relationships. This study also endorses that monetary and fiscal policies significantly impact natural economic mobility. Anderson and Jordan (1968) argue that monetary measures are superior by examining the various effects of fiscal and monetary interventions on output. Conversely, Ando and Modigliani (1965) and DePrano and Mayer (1965) provide evidence against monetarist views. On the other hand, Carlson (1978) shows evidence that the claim from Benjamin Friedman (1977) that fiscal policy is more effective is not valid and suggests that monetary policy has a greater and more significant impact on the real economy.

Blanchard and Perotti (2002) use a structural VAR technique to investigate the empirical relationship and found that government expenditure has a positive association with output while taxes have a negative relationship. Other studies, such as Chatziantoniou et al. (2013), Chen and Xu (2020), Divino et al. (2020), Olaoye et al. (2020), and Afonso and Alves (2023), find a positive link between fiscal spending and output, which is consistent with the classical Keynesian theory. Since Mountford and Uhlig (2009) show that the tax multiplier has a more significant influence than the spending multiplier, the Keynesian perspective of a smaller multiplier of tax cuts and a larger multiplier of spending on output is not fully supported. According to particular research, such as those by Bukhari and Yusof (2014) and Hasnul (2015), government expenditure hurts the increase of actual output since it crowds out rather than multiplier impacts, and as government spending rises, the productive sector is subjected to higher taxes. Furthermore, Sutherland (1997) and Perotti (1999) found that rising public debt harmed real GDP. On the other hand, Tang et al. (2013) demonstrated that government spending had a negligible association with output in various Asian countries. Contractionary fiscal policy, like procyclical policy, rather than expansionary fiscal policy, like countercyclical policy, hampers economic recovery during a recession (Baum et al., 2012; Rafiq, 2013). Baldacci et al. (2009) and Kannan et al. (2009) discovered that fiscal expansion can shorten the recession, while countercyclical policy works well for countries with lower public debt. Furthermore, government expenditure is more effective at stimulating growth than tax cuts. Slimane and Tahar (2010) identified that several MENA nations execute procyclical fiscal policy even during crises due to inadequate fiscal strength.

Some research (Sims, 1992; Li et al., 2010; Lee & Werner, 2018) demonstrated that monetary policy has a more substantial impact in recession but is not always the consensus. Other research, such as Mutuku and Koech (2014) and Ufoeze et al. (2018), found that policy and interest rates have a minor but favorable influence on production growth. Azali and Matthews (1999) found that money had a considerable influence on output growth in the post-crisis period, using a VAR model. Fung (2002), on the other hand, demonstrated via impulse response analysis that interest rates had an insignificant effect on output in the post-crisis period. The study's results disclosing the efficiency of monetary and fiscal policy in developing nations are likewise divided. Yasmin and Korner (1987) conducted studies for Pakistan; Upadhyaya (1991) for developing countries; Jayaraman (2002) for South Pacific Island Countries; and Ali et al. (2008) for the South Asian region, all of which support the monetarist proposition that monetary actions affect the real economy. Nonetheless, some studies, such as Hussain (1982) for Pakistan and Darrat (1984) for various Latin American nations, show that fiscal policy can stimulate actual output more effectively.

Tan et al. (2020) discovered that monetary policy is more effective in promoting economic growth in Malaysia and Singapore, whereas fiscal policy is significantly more effective in Thailand. In Bangladesh, studies such as Latif and Chowdhury (1998) discovered that fiscal policy is more practical despite the constraints outlined by Stein (1980) and Ahmed et al. (1984). In contrast, Hasan (2001) discovered that monetary and fiscal policies must be equally important to stimulate the economy. Using cointegration and error correction, Younus (2014) demonstrates that monetary and fiscal policy impact real economic growth, with monetary policy being more

successful in Bangladesh. Much research conducted in light of the Monetarist (Quantity Theory of Money) or Keynesian (St. Louis equation) approaches has revealed inconsistent results rather than any fruitful consensus over the century.

Furthermore, there are no clear indications of which types of policy mix, i.e., joint fiscal and monetary policy actions, will be required for developing nations like Bangladesh during the crisis. In contrast, no recent study has been discovered that addresses the question of policy mix in light of fiscal and monetary policies that will have active relevance in fighting for economic recovery during crises such as high inflation and the currency crisis in Bangladesh. Based on prior experience in Bangladesh, no acknowledged study with sufficient empirical relationship has been established to identify the influential role of monetary policy and fiscal policy, or both, during economic crises. As a result, employing sophisticated econometric approaches, this study will be a modest attempt to assess which monetary, fiscal, or both measures might be beneficial in recovering the economy from the ongoing economic crisis.

### 3. METHODOLOGIES, VARIABLES and DATA

#### 3.1. Conceptual Framework and Estimations

The conceptual framework of this study was constructed in light of macroeconomic rationales based on the Quantity Theory of Money, as well as fiscal indicators and some additional elements that can influence price and currency stability. The functioning of macroeconomic phenomena has been addressed to explain the relationship between monetary and fiscal policy and economic stability, as domestic prices in a country can be influenced by either demand-side or supply-side factors. Thus, monetary factors such as money supply and interest rates, which are demand-side indicators, can influence price changes in the economy. Furthermore, fiscal factors such as government expenditure and the import situation might impact prices, primarily demand-side indicators. In an import-dependent economy, many necessary commodities are imported to meet domestic demand, and as a result, domestic prices are highly influenced by external factors such as import prices. Based on the aforementioned conceptual framework, the specification can be phrased as follows in explaining the link between monetary and fiscal policy and inflation:

$$P = f(M, G, IR, IM) \quad (1)$$

This expression explains that price (P) is a function of money supply (M), government spending (G), interest rate (IR), and import (IM).

A similar conceptual structure can be utilized to assess the relationship between monetary and fiscal policy and currency stability. Currency crises are typically influenced by monetary measures such as money supply and interest rate as demand-side tools and fiscal measures such as government expenditure, exports, and remittances as supply-side tools. The conceptual expression can now be specified as follows:

$$ER = f(M, G, IR, EX, REM) \quad (2)$$

The expression focuses on the exchange rate (ER) as the function of money supply (M), government spending (G), interest rate (IR), export (EX), and remittance (REM).

This study's empirical framework used the ARDL model to investigate the relationship between monetary and fiscal policy, inflation, and currency stability. The use of the ARDL bounds test approach as an empirical methodology in time series econometrics allows the examination of the relationship between the combination of level variables with different orders of integration, such as I(0) or I(1) (Pesaran et al., 2001). However, this method is not applicable for regressors whose order of integration is second, I(2), or higher. Changing the order of the relationship may correct both the serial correlation and endogeneity problems (Pesaran et al., 1999). According to the ARDL framework, equations (1) and (2) can be stated as follows:

$$\Delta P_t = \beta_0 + \beta_1 M_{t-1} + \beta_2 G_{t-1} + \beta_3 IR_{t-1} + \beta_4 IM_{t-1} + \sum_{i=1}^n \gamma_{1i} \Delta P_{t-i} + \sum_{i=0}^n \gamma_{2i} \Delta M_{t-i} + \sum_{i=0}^n \gamma_{3i} \Delta G_{t-i} + \sum_{i=0}^n \gamma_{4i} \Delta IR_{t-i} + \sum_{i=0}^n \gamma_{5i} \Delta IM_{t-i} + \epsilon_t \quad (3)$$

$$\Delta ER_t = \beta_0 + \beta_1 M_{t-1} + \beta_2 G_{t-1} + \beta_3 IR_{t-1} + \beta_4 EX_{t-1} + \beta_5 REM_{t-1} + \sum_{i=1}^n \gamma_{1i} \Delta ER_{t-i} + \sum_{i=0}^n \gamma_{2i} \Delta M_{t-i} + \sum_{i=0}^n \gamma_{3i} \Delta G_{t-i} + \sum_{i=0}^n \gamma_{4i} \Delta IR_{t-i} + \sum_{i=0}^n \gamma_{5i} \Delta EX_{t-i} + \sum_{i=0}^n \gamma_{6i} \Delta REM_{t-i} + \epsilon_t \quad (4)$$

Where  $\Delta$  represents the first difference operator, and  $n$  signifies the appropriate lag length included in the model for various indicators. The cointegration connection is assessed in two parts in this ARDL bounds test approach. First, the OLS regression on the above-mentioned equations (3) and (4) is run, followed by an F-test to test the

significance of the lagged variables collectively. Long-run cointegration will be identified by limiting the coefficients of the lagged variables to zero, i.e., the null hypothesis represents no cointegration among the variables. In contrast, the alternative hypothesis reflects the presence of cointegration. The Wald test (F-statistic) was used to examine cointegration because it is a non-standard distribution with the null hypothesis of no cointegration among the variables. The entire thing is based solely on whether the variables under consideration include intercept and/or trend, I(0) or I(1), the number of exogenous variables, and the observation size. The lower and upper bounds of the critical bound for the test statistic are proposed by (Pesaran & Shin, 1995; Pesaran et al., 2001). The null hypothesis of no cointegration will be rejected if the F-test value exceeds the upper bound of the critical value. It can be emphasized that, in the long run, all variables exhibit a cointegrated relationship. Because the ARDL bounds test approach estimates the long-run connection and short-run dynamics, short-run corrections can be approximated using the error correction model. As a result, equations (3) and (4) can be rewritten in error correction form as follows:

$$\Delta P_t = \beta_0 + \sum_{i=0}^n \gamma_{1i} \Delta M_{t-i} + \sum_{i=0}^n \gamma_{2i} \Delta G_{t-i} + \sum_{i=0}^n \gamma_{3i} \Delta IR_{t-i} + \sum_{i=0}^n \gamma_{4i} \Delta IM_{t-i} + \delta ECT_{t-1} + \mu_t \quad (5)$$

$$\Delta ER_t = \beta_0 + \sum_{i=0}^n \gamma_{1i} \Delta M_{t-i} + \sum_{i=0}^n \gamma_{2i} \Delta G_{t-i} + \sum_{i=0}^n \gamma_{3i} \Delta IR_{t-i} + \sum_{i=0}^n \gamma_{4i} \Delta EX_{t-i} + \sum_{i=0}^n \gamma_{5i} \Delta REM_{t-i} + \delta ECT_{t-1} + \mu_t \quad (6)$$

The term ECT denotes the error correction from short-run disequilibrium in the long-run equilibrium relationship. In contrast, the coefficient of ECT measures the rate of adjustment from shock to equilibrium. This coefficient's negative and significant value demonstrates the variables' convergence towards long-run equilibrium.

### 3.2. Variables

In this investigation, log-transformed variables are used. Price (P) is measured by the consumer price index with a base year of 2005-2006 equal to 100, money supply (M) is measured by the nominal volume of broad money (M2) supply in million US dollars, government spending (G) is measured by government development expenditure in million US dollars, and interest rate (IR) is measured by the prime rate, which is the weighted average lending rate of the banking industries. The nominal exchange rate of BDT (Bangladesh Taka) per US dollar is represented by the exchange rate (ER); export (EX) denotes the readymade garment (RMG) export volume in a million US dollars; import (IM) denotes the volume of import payments in a million US dollars; and remittance (REM) denotes the volume of remittance inflows in a million US dollars.

### 3.3. Data source

This study's empirical analyses utilized annual time series data from 1991 to 2022. Bangladesh Bank (BB) provided information on the money supply (M), interest rate (IR), import (IM), remittance (REM), and exchange rate (ER). The Bangladesh Bureau of Statistics (BBS), Ministry of Finance (MoF), and Bangladesh Garment Manufacturers and Exporters Association (BGMEA) provided data on prices (P), government spending (G), and exports (EX).

## 4. DISCUSSION and EMPIRICAL RESULTS

The descriptive statistics for the study variables are presented in Table 1. It's worth noting that all the indicators considered in this research are log-transformed. This helps to increase the linearity of the empirical relationship by reducing heterogeneity and promoting the normality of the data. The descriptive statistics table indicates that the mean value of the variables falls within the middle point of the maximum and minimum values, with minimum standard deviation. The skewness and kurtosis values of the variables range from -2 to 2, indicating that the variables are normally distributed. Additionally, the probability values of the Jarque-Bera test suggest that, except for the variable IR, all variables follow the normality assumption. This means that the observations are likely to come from a normal distribution.

**Table 1.** Descriptive Statistics

Z	P	M	G	IR	ER	IM	EX	REM
Mean	4.7399	10.4432	7.8444	2.4756	4.1034	9.6891	9.0123	8.4792
Median	4.6399	10.2647	7.5650	2.5335	4.2177	9.6744	9.0514	8.5863
Maximum	5.7241	12.1946	9.4902	2.7160	4.4588	11.2844	10.659	10.1177
Minimum	3.8559	8.8531	5.3245	1.9586	3.5762	8.0446	6.7648	6.6384
Std. Dev.	0.5971	1.0800	1.0086	0.1957	0.2848	0.9615	1.1249	1.1356
Skewness	0.1591	0.1484	0.0249	-1.2363	-0.3882	-0.1389	-0.2839	-0.1826
Kurtosis	1.6665	1.6441	2.8109	3.8609	1.7109	1.7928	1.9271	1.4976

Jarque-Bera	2.5058	2.5688	0.0509	9.1399	3.0193	2.0458	1.9649	3.1873
Probability	0.2856	0.2768	0.9748	0.0103	0.2209	0.3595	0.3743	0.2031
Observations	32	32	32	32	32	32	32	32

The empirical analysis employing time series data includes variables with a non-stationary problem. The stationarity test determines whether or not the variables have a unit root. This test is used to determine the order of integration that variables exhibit, and based on this, variables will be classified as stationary either in level  $I(0)$ , or in the first difference,  $I(1)$ . The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were used to perform the unit root tests, and the findings are given in Table 2. The findings of the unit root tests reveal that all of the study variables reflect the order of integration at the first difference or level; thus, the analysis can use the ARDL bounds test approach to investigate the presence of a long-run relationship among the variables.

**Table 2.** Results of Unit Root Tests

<b>Augmented Dickey-Fuller (ADF) Test</b>		
Variables	Level	1st Difference
P	0.3354	-2.9585*
M	0.8845	-3.9856***
G	-0.7844	-8.8169***
IR	0.6044	-4.4355***
IM	-0.4858	-4.8651***
ER	-1.8512	-5.0753***
EX	-2.1396	-5.4593***
REM	-1.1962	-4.7550***
<b>Phillips-Perron (PP) Test</b>		
Variables	Level	1st Difference
P	0.7903	-2.8665*
M	0.8845	-3.9534***
G	-1.1301	-11.7726***
IR	0.5818	-3.3018**
IM	-0.4143	-4.9524***
ER	-4.6326***	-5.1139***
EX	-2.3189	-5.4617***
REM	-1.1428	-4.9378***

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , and \* $p < 0.1$  mean statistical significance at 1%, 5%, and 10%, respectively

Apart from conducting standard unit root tests for stationarity, this study also employs the breakpoint unit root test for the variables. This is because the time series data may violate the stationarity property due to the presence of several breakpoints, and the existence of structural breaks might be the reason behind non-stationarity in the time series data. Table 3 displays the results of the breakpoint unit root test. The findings indicate that the variables being studied exhibit first-order integration with different breakpoints, after considering the breakpoint selection by Dickey-Fuller min-t. However, none of the variables show stationarity at the level. Since the study variables exhibit the first difference order of integration with breakpoint, the mixed order of integration in standard unit root tests in the time series is not due to a structural break. Hence, based on these facts, we can utilize the ARDL technique to determine the long-run cointegration among the variables, without any breakpoint, since the occurrence of structural breaks does not involve non-stationarity for the time series variables.

**Table 3.** Results of Unit Root Test with Breakpoint

Variables	Level		1st Difference	
	t-Statistic	Breakpoint	t-Statistic	Breakpoint
P	-1.9716	2005	-5.3882***	2001
M	-3.1190	2007	-4.2399*	1998
G	-3.5564	2012	-9.1606***	2003
IR	-3.4634	2019	-5.7624***	2014
IM	-2.6132	2004	-5.3412***	1995
ER	-4.2070*	2001	-5.3860***	2013
EX	-3.9297	2005	-6.0166***	1998
REM	-3.1239	2005	-5.6977***	2017

Notes: \*\*\*, \*\*, and \* mean statistical significance at 1%, 5%, and 10%, respectively



The F-test for the null hypothesis of no cointegration, as well as a selection of lag length using the Akaike information criterion (AIC), were used to investigate long-run cointegration. Table 4 shows the cointegration test results, which show that the estimated value of the F-statistic for both specifications exceeds the critical region's upper bound at the 1% significance level. This indicates a long-run relationship between the variables included in both specifications, such as inflation, monetary factors, and fiscal factors, as well as currency, monetary factors, and fiscal factors.

**Table 4.** Cointegration Test

Model Specification	Test Statistic	Value	Significant level	I(0)	I(1)
$P = f(M, G, IR, IM)$	F-statistic	8.08	10%	2.20	3.09
			5%	2.56	3.49
			2.5%	2.88	3.87
			1%	3.29	4.37
			10%	2.08	3.00
$ER = f(M, G, IR, EX, REM)$	F-statistic	8.02	5%	2.39	3.38
			2.5%	2.7	3.73
			1%	3.06	4.15

The long-run coefficients were estimated using OLS after assessing the existence of cointegration, and the estimation results are shown in Table 5. At the same time, the considered lag of each of the study variables in the ARDL specification is chosen based on the AIC.

**Table 5.** Estimation of the Coefficients of Long-Run Relationship

Model Specification: $P = f(M, G, IR, IM)$ ARDL (1, 0, 0, 0, 2)		Model Specification: $ER = f(M, G, IR, EX, REM)$ ARDL (1, 1, 0, 2, 2, 1)	
Regressors	Coefficients	Regressors	Coefficients
M	0.3539***	M	-1.7044
G	0.0370*	G	0.0015
IR	0.0826	IR	-0.5753
IM	0.2198**	EX	-0.0852
		REM	1.7791

Notes: \*\*\*, \*\* and \* mean statistical significance at 1%, 5%, and 10%, respectively

According to the estimated coefficients of the long-run relationship between inflation, monetary, and fiscal factors, money supply influences inflation more than government spending, with 0.35% and 0.037% increases in inflation occurring in 1% increases in money supply and government spending, respectively. This relationship between inflation, money supply, and government spending supports monetarist and Keynesian viewpoints since monetary and fiscal policy's combined actions are required to control inflation in Bangladesh. However, the more significant influence of money supply on inflation than government spending tells us that monetary actions are somewhat more effective than fiscal actions in controlling high inflation. In contrast, the interest rate has no statistically significant association with inflation, but imports positively influence inflation, with a 1% rise in imports influencing a 0.219% increase in inflation. These findings show that interest rate instruments have little influential contribution that can handle domestic price changes. Furthermore, in Bangladesh, rises in import payments might influence inflation, indicating that rising import prices on the global market can dramatically boost domestic prices.

The long-run estimation results of the relationship between the exchange rate, monetary factors, and fiscal factors show statistically insignificant results, implying that the money supply, government spending, interest rate, exports, or remittances do not influence the exchange rate or currency instability in Bangladesh. Although this long-term relationship has little statistical consistency, the negative signs obtained by the coefficients of money supply, interest rate, and export provide some insightful economic direction. While economic thought suggests that the exchange rate or currency instability, which means the depreciation of the Bangladeshi taka, can be handled by increasing the money supply and interest rate, Because the country's currency rates are not market-based, the central bank has already adopted this strategy by intervening in foreign exchange markets to stabilize the exchange rate. This mechanism, however, is no longer credible for resolving the currency problem. As a result, more exports of diverse items and increased remittance inflows through proper channels are required, and excessive import demand must be addressed by expanding domestic output.

The error correction method estimates the short-run dynamic adjustment in the long-run cointegration relationship. The estimated coefficients of ECT for the link between monetary and fiscal factors, inflation, and the exchange rate are shown in Table 6. The coefficient of ECT in the relationship between inflation, monetary factors, and fiscal factors has a negative sign. It produces statistically significant results, implying that around 33% of disequilibrium will adjust to the long-term equilibrium path in the short run by a year. It is estimated that the adjustment rate will take approximately three years to return to equilibrium in the relationship of inflation stabilization. The short-run adjustment mechanism implies that imports have a greater impact on stabilizing prices in the long-run equilibrium relationship. As a result, the combined effort of monetary and fiscal interventions can moderate inflationary pressures in the domestic market in three years.

The long-run link between exchange rates and monetary and fiscal factors has not demonstrated any statistical significance of the influence of fiscal and monetary measures on exchange rates. In the estimation of error correction, the coefficient of ECT has a statistical significance with a negative sign, indicating that only 6% of the error will adapt to the long-run equilibrium point in a year. Although money supply and export offer significant short-run benefits for achieving long-term exchange rate stability, in Bangladesh, various other factors, such as trade-based money laundering, over-import reliance, and unsuitable channels of remittance inflows, may be involved in currency instability.

**Table 6.** Estimation of the Short Run Dynamics

<b>Model Specification: <math>P = f(M, G, IR, IM)</math>, ARDL (1, 0, 0, 0, 2)</b>				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IM)	0.1048	0.0188	5.5643	0.0000
D(IM(-1))	-0.0583	0.0224	-2.5979	0.0168
ECT(-1)	-0.3266	0.0126	-25.7874	0.0000
<b>Model Specification: <math>ER = f(M, G, IR, EX, REM)</math>, ARDL (1, 1, 0, 2, 2, 1)</b>				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(M)	-0.7433	0.0899	-8.2649	0.0000
D(IR)	0.1250	0.0493	2.5365	0.0207
D(EX)	-0.0969	0.0324	-2.9870	0.0079
D(EX(-1))	-0.0964	0.0334	-2.8815	0.0099
D(REM)	0.0279	0.0272	1.0236	0.3195
ECT(-1)	-0.0625	0.0072	-8.6522	0.0000

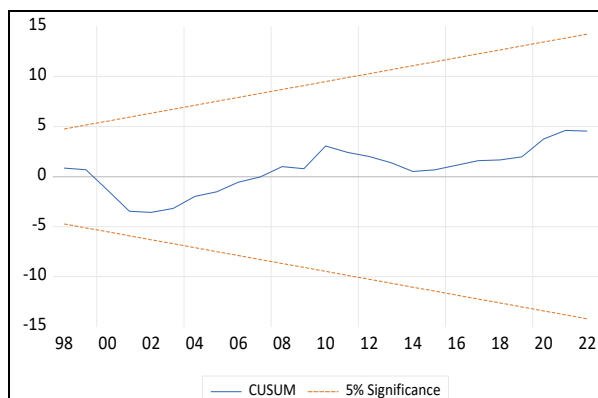
**Notes:** D indicates first difference, (-1) refers one lag and ECT represents error correction term

The robustness of the ARDL estimation was tested using multiple diagnostic tests for the estimated residuals, such as autocorrelation, normality, and heteroscedasticity. The model specification, also known as the structural stability test, is used to determine whether or not the specification is stable. The results in Table 7 show that both models are free of the autocorrelation problem and adhere to the normality and homoscedastic assumptions. The Ramsey Reset test confirms that both models' specifications are stable and have no specification errors.

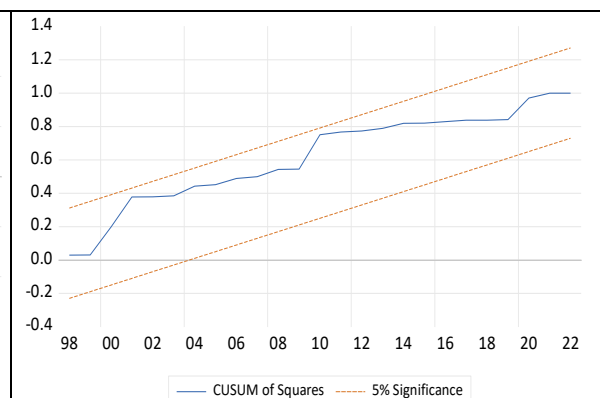
**Table 7.** Robustness Check for ARDL Estimations

<b>Model Specification</b>	<b><math>P = f(M, G, IR, IM)</math></b>		<b><math>ER = f(M, G, IR, EX, REM)</math></b>	
	Test	Test Statistic	Test Statistic	Prob.
Serial Correlation	F-statistic = 0.3272	0.7242	F-statistic = 1.3155	0.2958
Normality test	Jarque-Bera = 3.4302	0.1799	Jarque-Bera = 2.2677	0.3217
Heteroscedasticity	F-statistic = 0.4814	0.7867	F-statistic = 0.6974	0.7255
Ramsey Reset	F-statistic = 0.7454	0.3965	F-statistic = 0.0937	0.7632

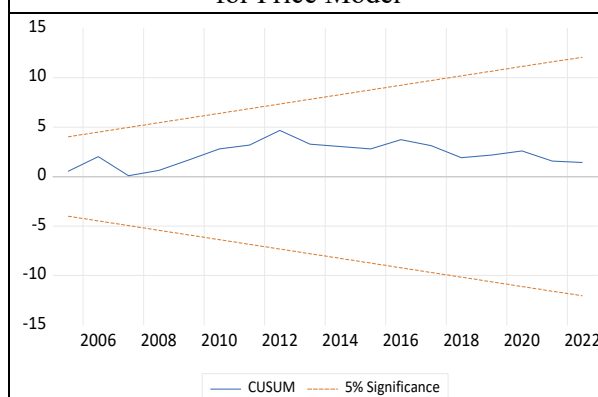
In addition, the stability of the ARDL estimators' parameters has been tested using the cumulative sum of recursive residuals (CUSUM) test and the cumulative sum of recursive residual squares (CUSUM-squares) test. The results are presented in Figure 4, Figure 5, Figure 6, and Figure 7. The estimated values of CUSUM and CUSUM-squares for both models are within the boundary of the 5% significant level. This indicates that the models are structurally stable, and there have been no structural breaks in the long-term stability among the mentioned relationships.



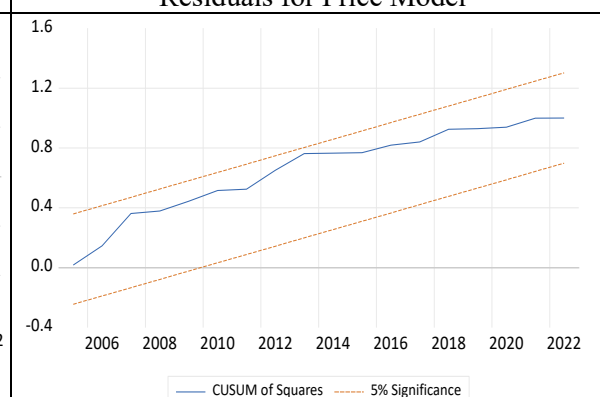
**Figure 4.** CUSUM Test of Recursive Residuals for Price Model



**Figure 5.** CUSUM-squares Test of Recursive Residuals for Price Model



**Figure 6.** CUSUM Test of Recursive Residuals for Exchange Rate Model



**Figure 7.** CUSUM-squares Test of Recursive Residuals for Exchange Rate Model

## 5. CONCLUSION and POLICY IMPLICATIONS

In recent years, Bangladesh has experienced high inflation and a currency crisis. Although some external factors, such as the Russia-Ukraine war, contribute to the country falling into such crises, some internal factors, such as money laundering, contribute to the country going into such crises. Aside from these considerations, how can a country's two key monetary and fiscal policies work together to rebuild the economy from economic crises such as the currency crisis and excessive inflation? This study aims to investigate the effects of monetary and fiscal policy on stabilizing Bangladesh's currency crisis and rising inflation. This study employs an ARDL bounds test approach to analyze the empirical link between monetary and fiscal policies on inflation and the exchange rate using annual time series data on various indicators from 1991 to 2022. The study's findings show that money supply and government expenditure have a considerable positive influence on inflation.

However joint actions or a policy mix of monetary and fiscal policies can quickly stabilize excessive inflationary pressures. The results obtained from this analysis are consistent with the research conducted by Hasan (2001) and Yunus (2014), but somewhat inconsistent with the findings of Latif and Chowdhury's (1998) study. The results of this study confirm the findings of Tan et al. (2020) for Malaysia and Singapore. Although monetary and fiscal variables do not seem to have a significant impact on exchange rate stability, it is noteworthy that the exchange rate in Bangladesh is not market-based and may be influenced by other factors. However, it is likely that variables such as money supply, exports, and remittances may have a significant impact on currency stability in the economic context.

To maintain price stability in the domestic market, it should be required to ensure adequate coordination between monetary and fiscal policy. Once monetary policy can be established independently, fiscal dependence on monetary policy should be reduced for budget deficit financing. The prices of local markets are affected by both demand and supply-side factors. Essential goods are mostly imported, which results in an increase in domestic market prices being influenced by external factors as well as internal ones. Therefore, it is important to reduce import dependency to prevent price hikes in the domestic market. To stabilize the currency, it is crucial to diversify products and increase export receipts in order to enhance export earnings. Additionally, promoting regular inflows of remittance through proper channels could also contribute to currency stability.

This study uses annual time data to examine the effects of monetary and fiscal policy on price and currency stability; nevertheless, employing high-frequency data with different approaches and integrating other explanatory factors might be researched to address this analysis's research gap.

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#### **AUTHORS' DECLARATION:**

This paper complies with Research and Publication Ethics, has no conflict of interest to declare, and has received no financial support.

#### **AUTHORS' CONTRIBUTIONS:**

The entire research is written by the author.

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