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Revisiting The Relationship Between Economic Growth and Select Macroeconomic Indicators in the Indian Economy: Evidence from Using the ARDL Model

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ABSTRACT

The identification of critical macroeconomic elements driving economic growth in emerging countries becomes a complex issue because of the socio-economic, infrastructural, and governance characteristics. The diverse social, governmental, and infrastructure systems make it difficult to pinpoint the essential macroeconomic factors that influence economic growth in developing nations. The article uses annual data over the 33 years from 1990 and 2022 to examine the effects of foreign direct investment, broad money supply, trade openness, corruption perception index, official exchange rate, and inflation on economic growth in India. We used Autoregressive Distributed Lag Model (ARDL) to investigate the short and long-term relationship between economic growths and select macroeconomic variables. The study's findings demonstrate that trade openness and exchange rates have a detrimental impact on economic growth. The corruption perceptions index and foreign direct investment, on the other hand, have a positive long-term effect on economic growth. The short-term results demonstrate that several of the listed macroeconomic drivers have a positive or negative impact on economic growth. The findings of this empirical study have some policy implications for decision-makers and the government.

I. INTRODUCTION

Macroeconomic management is one of the major issues that has received a lot of attention in the literature. With its influence on economic variables, monetary policy, trade openness, official exchange rate and broad money supply are crucial components of macroeconomic management in an open economy to foster economic stability and advance economic growth. In developing nations, it is commonly accepted that monetary policy has an impact on macroeconomic variables such as GDP growth, the inflation rate, the availability of money, and interest rates (Anowor and Okorie 2016; Precious 2014). To successfully implement any economic policy in general and achieve sustainable economic growth, the authority and policy maker always focuses on the intermediate variables including money supply and interest rate, which are thought of as the most potent instruments of monetary policy. Accurate information on the effectiveness of the policy on the macro economy is the main issue of the policy maker (Fasanya et al., 2013).

Due to the critical role it plays in economic development in emerging nations, the link between macroeconomic factors and economic growth has recently drawn more and more attention. Several academics have also spoken about how macroeconomic factors affect economic growth. For instance, Fischer (1991) concluded that macro policies do matter for growth after conducting an empirical examination of 73 countries during the years 1970 to 1985 and finding that high inflation had a negative impact on the rate of per capita income growth. Monetary trends in the Indian economy, as indicated by movements in the broad money (M3) and reserve money (M 0), in the post-reforms period of the 1990s vis-à-vis the pre-reforms period of the 1980s, point towards definite changes in the monetary process. Under the monetary targeting regime, the broad money supply (M3) in India is set as the intermediate target. M3 grew at the decadal average of 17.2 per cent in the 1990s as well as the 1980s (RBI, 1999)). Babatunde and Shuaibu (2011) looked at the money supply, inflation, and economic growth in Nigeria; the results revealed a bad correlation between the two. According to Gul et al. (2012), money supply has a significant positive influence on production whereas interest rates have a negative impact. According to Ayub and Maqbool (2015), Pakistan's money supply, interest rate, and inflation rate all have a significant impact on GDP. Mensah and Ebenezer (2015) researched how interest rates and inflation affected Ghana's real economic growth rate and came to the conclusion that interest rates had a negative effect. Alavinasab (2016) examined the effect of monetary policy on economic growth in Iran using time series data that was suitable for an error correction model (ECM). The results of the regression analysis revealed that the long-term impact of the money supply and inflation on economic growth was significant. In their investigation of the relationship between public investment and economic growth in East Asian nations, Bukhari et al. (2007) discovered that both public and private investment had a long-term, dynamic influence on economic development in the region.

The importance of trade openness has been gaining momentum since the time of globalization. Each country is now giving priority towards the new strategies to assimilate the domestic economy to the world economies through the opening of its trade through different channels. The trade openness has been regularly contributing to economic growth in both developing and developed countries in less or to a greater extent. On this backdrop, theoretical models show that trade openness facilitates the efficient allocation of resources through comparative advantage, leading to increased income levels (Grossman & Help man, 1991).

Osiegbu and Onuorah (2011) posit that exchange rate plays a key role in international economic transactions because no nation can remain in isolation due to varying factor endowment. Movements in the exchange rate have screwed up effects on other economic variables such as interest rate, inflation rate, import, export and output, and so on. These facts underscore the importance of exchange rate to the economic well-being of every country that opens its doors to international trade in goods and services. The importance of exchange rate derives from the fact that it connects the price systems of two different countries making it possible for international trade to make direct comparison of traded goods.

Yet, some study found no connection between monetary policy and economic development. In South Africa, a small and open economy, for instance, Khabo and Harmse (2005) evaluated the effect of monetary policy on economic development. Their findings revealed that neither the money supply nor inflation substantially influence changes in economic growth. It was further proven by Babatunde and Shuaibu (2011) that there is no connection between money supply and economic development.

Corruption in India is all pervasive. There is no activity of the nation which is totally free from this malaise. The World Economic Forum Survey ranked India 45th out of 49 countries on the

honesty of its officials. The Corruption Perception Index of Transparency International has depicted India as becoming more corrupt in recent years. We have the dubious distinction of belonging to the category of the most corrupt nations in the world. Broadly speaking, corruption can be divided into two categories. In the first is the grand larceny where those in power pocket hundreds of crores in kickbacks in public procurement. Bofors, H.D.W. Submarines etc. The second category consists of what might be called petty corruption where people pay even for the services to which they are fully entitled. The bureaucrat, the customs & excise inspectors, the doctors and touts in government hospitals all extract money from the citizen on one pretext or the other (Corruption in India, 2002).

Many theoretical and empirical research on emerging nations have been done in the growth literature to ascertain the precise impact of macroeconomic factors on economic development. We have identified various methodological and economic flaws that might account for the erratic regression study outcomes. As a result, this study examines the dynamic impact of macroeconomic factors on economic development in India and makes suggestions for methodological and statistical advancements that may be made to existing research on the subject.

The autoregressive distributed lag (ARDL) approach is used to estimate growth regressions based on a large sample of developing nations during a 33-year period.

II. LITERATURE REVIEW

Many studies have been performed to look at how macroeconomic factors affect economic development from the viewpoints of various nations. Ayyoub et al. looked at the link between Pakistan's inflation and economic development from 1972–1973 to 2009–2010. (2011). they used the Ordinary Least Squares (OLS) model and came to the conclusion that there was a substantial negative association between Pakistani inflation and economic development. Faria and Carneiro also noted a negative association between inflation and economic growth (2001). They examined the Brazilian economy from 1980–1981 to 1996–1997 and found that although inflation had no long-term effect on real production, it had a short-term negative impact on output.

Using Co-integration and the Granger causality test, Philip (2010) determined that there is a unidirectional causal link between inflation and economic growth in Nigeria over the period 1970–2005 but no co-integrating relationship. Mamo (2012) examined 13 SSA countries from 1969 to 2009 and discovered a substantial inverse link between inflation and economic growth. Anaripour (2011) examined the connection between interest rates and economic development for 22 nations between 2004 and 2010 and came to the conclusion that there was a bad connection. Agalega and Antwi (2013) investigated Ghana's economy from 1980 to 2010 to determine how interest rates and inflation affected GDP. They discovered a significant positive association between GDP, interest rate, and inflation by the use of multiple linear regressions, and found that the variance of interest rate and inflation accounted for almost 44% of the variation in GDP. They emphasized that the correlation between GDP and inflation is positive, but the correlation between GDP and interest rates is negative.

Based on data from 1979 to 2010, Inyiama (2013) discovered that, in Nigeria, inflation was favourably correlated with interest rates and currency rates while negatively correlated with real GDP. When examining the relationship between economic growth, fixed investment, and household consumption in Malaysia, some researchers used the structural vector error correction model (SVECM) approach. They discovered that while household consumption and

foreign direct investment had a significant short-term impact on GDP, in the long run, economic growth had a lasting effect on both household consumption and investment (Karim et al., 2012).

Researchers examined Pakistan's economy between 1980 and 2013 to determine how factors such as inflation, interest rates, currency rates, and foreign direct investment (FDI) affected GDP growth (Kibria et al., 2014). They discovered via multiple regression analysis that FDI, currency rate, interest rate, and inflation had a substantial impact on Pakistan's GDP growth. Their research also revealed that, with the exception of FDI, all factors exhibit negative correlations with GDP growth. In the same year, Tapsin and Hepsag (2014) discovered a positive correlation between GDP and household consumption expenditure by analyzing data on household consumption expenditure for the EA-18 nations from 2000 to 2012. Studying the effects of inflation, interest rates, and exchange rates on Indonesian GDP from June 2005 to December 2013, Semuel and Nurina (2015) found that inflation was strongly correlated with GDP whereas exchange rates were not.

In his study of the relationships between GDP, export, and investment in Iran from 1991 to 2008, Mofrad (2012) discovered that export and investment had a long-term, considerable beneficial impact on GDP growth. Ahmed (2005) investigated the link between inflation and economic development from 1980 to 2005. Real GDP was used to reflect economic expansion, while the consumer price index (CPI) was used to measure inflation. Their investigation found a long-term negative relationship between inflation and economic growth.

An empirical study revealed that India’s rate of economic growth in the nineties has been the highest in the last 50 years, but there are signs that it is slowing. Experts think the massive country could have done better had it not been for widespread corruption in its system. According to Transparency International’s Corruption Perception Index, India has been continuously ranked as one of the most corrupt countries in the world. A World Economic Forum survey of 2002, ranked India 45th out of 49 countries on the honesty of its officials and 44th in the effectiveness of laws protecting shareholders (Corruption in India, 2002).

Say an Banerjee (2017) revealed that a change in the broad money supply, can impact the aggregate demand side of the economy, and thus change the inflation rate in it. Incorporation of broad money supply captures the developments in the commercial banking sector as well the financial transaction that are essentially driven by currency notes. A change in the broad money supply shall be reflected in the value of the index. It could be used as an early warning signal for volatility in the inflation rate in the economy. This may be useful in managing the stability in the economy as the central bankers would be able to implement effective instruments to achieve their targets in appropriate time period.

It is clear from the consideration of associated literatures above that several academics have given the study of macroeconomic factors and economic development a great deal of attention. Yet, no study has been able to definitively define this connection. So, there are many possibilities to fully examine this connection. This research aims to take advantage of this opportunity by examining the effects of macroeconomic factors on economic growth in India.

III. Statistical Methods and Data Sources

Using the ARDL limits testing method (Peasant et al., 2001), the current research attempts to evaluate the impact of a few economic factors on economic growth in India. Time-series data spanning 33 years, from 1990 to 2022, were collected for the analysis. All of the indicators' relevant data were gathered from secondary sources. The official websites of the World Bank

and Transparency International (2022) have been used to retrieve the data for the chosen variables.

The article aims to determine whether particular dependent and independent variables are associated in the short- and long-term using the ARDL method. ARDL limits test approach has certain inherent advantages over the Traditional full maximum likelihood (Johansen & Juselius, 1990) and residual-based co-integration procedures (Engle & Granger, 1987). To develop the general-to-specific structure, the ARDL model embraces an appropriate number of lags (Laurenceson & Chai, 2003). Additionally, unlike other approaches, the ARDL model tracks the long-term relationship with dependent variables with the aid of a single condensed equation (Shrestha & Chowdhury, 2007). Crucially, the error correction model (ECM) integrates the short-run and long-run without discarding the long-run evidence (Collier & Goderis, 2012).

The I(0) and I(1) order combination is represented by variables in the current study work. As a result, the entire maximum likelihood approach of Johansen and Juselius (1990) is inappropriate for application with the current variables. The modified Dickey-Fuller test from 1979 has been used to determine whether a serial correlation exists in the series. Phillips-Perron unit root tests have also been used to examine the proposed series' drift and trends (1988). After that, Equation (1) is modified to use an ARDL limits estimation, which is shown in Equation (1):.

$$GDP = f(\ FDI, TO, BMS, EXCH, INF, CPI,) \qquad (1)$$

$$\begin{aligned}\Delta GDP_t = d_0 &+ \sum_{i=1}^{n} d_{1i}\Delta GDP_{t-1} \\ &+ \sum_{i=0}^{n} d_{2i}\ \Delta FDI_{t-1} \\ &+ \sum_{i=0}^{n} d_{3i}\ \Delta BMS_{t-1} \\ &+ \sum_{i=0}^{n} d_{4i}\ \Delta TO_{t-1} \\ &+ \sum_{i=0}^{n} d_{5i}\ \Delta INF_{t-1} \\ &+ \sum_{i=0}^{n} d_{6i}\ \Delta CPI_{t-1} \\ &+ \sum_{i=0}^{n} d_{7i}\ \Delta EXR_{t-1} + \beta_1 GDP_{t-1} + \beta_2 FDI_{t-1} + \beta_3 BMS_{t-1} + \beta_4 TO_{t-1} + \beta_5 INF_{t-1} \\ &+ \beta_6 CPI_{t-1} + \beta_7 EXR_{t-1} + \mu_t\end{aligned}$$

Table-1: Variable and data source

Symbols	Explanation	Time path	Source
GPC	GDP is per capita income (current 2015 US$) and used as a proxy for economic	1990-2022	The World Bank
FDI	Foreign direct investment, net inflows (BoP, current US$)	1990-2022	The World Bank
BMS	Broad money (current LCU) - India	1990-2022	The World Bank
Inflation	Inflation, consumer prices (annual %) - India	1990-2022	The World Bank
TO	Trade Openness (% of GDP) - India	1990-2022	The World

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			Bank
CPI	Corruption Perceptions Index	1990-2022	Transparency International
EXCR	Official exchange rate (LCU per US$, period average) - India	1990-2022	The World Bank

where GDP is a measure of per capita income (current 2015 US dollars) and is used as a proxy for economic growth, FDI is a measure of net FDI inflows (BOP current US dollars) and is used to measure trade opportunities in India, The International Monetary Fund's balance of payments data are the foundation for the data on equity flows (IMF). BMS stands for "net broad money," which is the total of currency held outside of banks, demand deposits other than those held by the government, time, savings, and foreign currency deposits held by resident sectors other than the government, bank and traveler's checks (current LCU), and India's bank and savings deposits. The Corruption Perceptions Index (CPI) rates nations and territories according to how corrupt their public sector is thought to be. On a scale from 0 (extremely corrupt) to 100, a country or territory's score reflects the perceived level of public sector corruption (very clean).

The ratio of the amount of exports and imports to GDP, which is calculated using constant 2010 US dollars, is used to calculate the size of trade openness (TOP) in India (Chirwa & Odhiambo, 2017). Moreover, EXCH stands for the exchange rate (LCU per US$, period average), which is utilised as a proxy for trade volatility and risk (Ilhan, 2006).

Last but not least, the consumer price (annual,%) series is composed of independent variables to assess the effect of inflation on GDP growth. According to Burnside and Dollar (2000), a country's monetary policy is reflected in its inflation rate.

For the short-run and long-run relationship, Equation (2) is condensed, and the short-run coefficients are represented as α1……, ..α7 and the long-run coefficients as β1…,…. β7. Additionally, μt is utilised for the residual term, α0 is used for intercept and Δ displays the difference. Summation gestures are used in Equation (2) to depict the dynamics of error correction. Assuming the lack of long-run relationships, the long-run equation is β1 = β2 = β3 = β4 = β5 = β6 = β7 = 0, displaying the null hypothesis. The ideal order of the VAR for the combined data set has been determined to be two based on the LR, FPC, and AIC criteria. In order to evaluate the short-run dynamics, an ECM is then observed as follows:

Eq(2)

$$\Delta GDP_t = d_0 + \sum_{i=1}^{n} d_{1i}\Delta GDP_{t-i} + \sum_{i=0}^{n} d_{2i}\,\Delta FDI_{t-i} + \sum_{i=0}^{n} d_{3i}\,\Delta BMS_{t-i} + \sum_{i=0}^{n} d_{4i}\,\Delta TO_{t-i} + \sum_{i=0}^{n} d_{5i}\,\Delta INF_{t-i} + \sum_{i=0}^{n} d_{6i}\,\Delta CPI_{t-i} + \sum_{i=0}^{n} d_{7i}\,\Delta EXR_{t-i} + \lambda ECM_{t-i} + \mu_t$$

The remainder of the variables in Equation (2) are identical to those in Equation, with the exception of mt, which stands for the ECM t-i coefficient (1). ECM t-i, which measures the rate of change from the short-run to the long-run equilibrium, is anticipated to have a negative sign and a significant p-value for a workable ARDL model.

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IV. RESULTS INTERPRETATION

Table 2.

Stationary check at Level					Stationary check at 1st Difference			
	ADF (p-value)		Phillip-Perron (p-value)		ADF (p-value)		Phillip-Perron (p-value)	
Variables	Without Trend	With Trend	Without Trend	With Trend	Without Trend	With Trend	Without Trend	With Trend
GDP	0.9326	0.3369	0.9305	0.2446	0.0000***	0.0002***	0.0000***	0.0002***
FDI	0.5391	0.5180	0.4255	0.5589	0.0000***	0.0000***	0.0000***	0.0000***
BMS	0.0265**	1.0000	0.0709	1.0000	0.9856	0.0095***	0.0302***	0.0099***
Inf	0.0000***	0.0000***	0.0801*	0.1435	0.0000***	0.0000***	0.0000***	0.0000***
TO	0.5371	0.8389	0.5350	0.8694	0.0004***	0.0019***	0.0004***	0.0019***
CI	0.8889	0.1496	0.8667	0.1406	0.0002***	0.0006***	0.0002***	0.0006***
EXCR	0.8666	0.7503	0.8542	0.6149	0.0003***	0.0024***	0.0003***	0.0024***

Notes: (1) 1% level = ###, 5% level = ## and 10% level of significance = # (Indicates the significance of all p -values at the respective degree of freedom).

(2) Null hypothesis: series has a unit root.

(3) ADF represents augmented Dickey–Fuller.

(4) The decision is taken on the basis of p-values.

UNIT ROOT TEST

Data in time series typically exhibit a nonstationary pattern. In order to verify the stationarity of encompassed variables, augmented Dickey-Fuller (1979) and Phillips-Perron (1988) tests have been run. Table 2 displays the results of unit root tests.

The outcomes of the augmented Dickey-Fuller and Phillip-Perron unit root tests are shown in Table 2. Table 2 clearly shows that the level of GDP, BMS, FDI, TO, CPI and EXCR is nonstationary, and Inflation is stationary at the level. But whether at the level or at the initial difference, all the variables are stationary. Thus, a co-integration relationship can be investigated by utilising bounds tests (Pesaran et al., 2001).

The results of Table 3 show that, at a 1% level of significance, the upper critical bound value is less than the calculated F-value (3.99< 7.27) (Pesaran et al., 2001). As a result, the null hypothesis cannot be accepted, indicating a long-term link between the independent and dependent variables. The evaluation of the long-term relationship between the GDP and independent variables follows, as shown in Table 3.

Table 4 results demonstrate a long-term correlation between the dependent and independent variables. Broad money supply and corruption perceptions index each have a positive and significant impact on GDP at levels of significance of 5% and 10%, respectively. And on the other hand, trade openness and exchange rate have a negative and significant impact on GDP at

5%, 1% and 10% respectively. Economic growth will increase by 0.88 per cent for every 1% increase in the broad money supply. A rise in the money supply increases the amount of available funds in the economy, which lowers interest rates and encourages private investment. On the other hand, a 1 % increase in the exchange rate will lower economic growth by 0.03. The correlation between the exchange rate and GDP shows that changes in the exchange rate have a detrimental effect on India's GDP growth. The fact that both variables have a negative long-run connection shows that exchange rate swings significantly affect India's GDP growth. The findings of Chirwa and Odhiambo's (2017) analysis likewise showed a long-term inverse relationship between exchange rate and GDP growth. Consequently, it is preferable to have a stable exchange rate to accelerate economic growth. The economic growth has been favourably impacted by 0.01 with the 1% CPI hike. It is a key worry for economic growth despite the fact that its impact is low. This finding is in line with the research of Tomola M. Obamuyi (2019), who contends that India's economic development was facilitated by corruption. According to a study by Huang, Chiung-Ju (2015), economic growth in China appears to have a strong beneficial impact on corruption. This suggests that as economic growth has increased, so has corruption. Yet, it has been determined that trade openness had little effect on long-term economic growth during the study period. The results of analysing the individual effects of import and export on GDP growth may differ. The results of Ghoshal's (2015) study make it clear that export and import contributions need to be examined separately when evaluating the impact of trade openness on economic growth.

Yet, it has been determined that trade openness and inflation had little effect on long-term economic growth during the study period. The absence of capital and labour from the model may be the cause of the minimal impact of trade openness. The results of analysing the individual effects of import and export on GDP growth may differ. The results of Ghoshal's (2015) study make it clear that export and import contributions need to be examined separately when evaluating the impact of trade openness on economic growth.

Table 3: F-Bounds Test

Null Hypothesis: No levels relationship				
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	7.276423 ***	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

Notes: (1) 1% level = ###, 5% level = ## and 10% level of significance =
(Indicates the significance of all p -values at the respective degree of freedom).
(2) Null hypothesis: absence of the long-run relationships.

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Table 4. Estimated Results (Long Run)

Long-Run Coefficients (Dependent Variable GDP t)				
Variable	Coefficient	Std. Error	t-Statistic	p-Value
LFDI	0.006510	0.02838	0.229338	0.8212
LBMS	0.879044	0.13055	6.733013	0.0000
TO	-0.013496	0.00494	-2.730074	0.0137
INFLATION	0.011590	0.00724	1.599906	0.1270
CPI	0.013066	0.00627	2.081966	0.0519
EXR	-0.034293	0.00888	-3.860795	0.0011
C	-18.63387	3.08308	-6.043904	0.0000

EC = LGPC - (0.0065*LFDI + 0.8790*LBMS -0.0135*TO + 0.0116*INFLATION + 0.0131*CPI -0.0343*EXR- 18.6339)

Source: The authors.

Notes: (1) 1% level = ###, 5% level = ## and 10% level of significance =

(Indicates the significance of all p -values at the respective degree of freedom).

Table 5. Estimated Results (Short Run) Error Correction Representation (Dependent Variable ΔGDP_{t-1})

Variable	Coefficient	Std. Error	t-Statistic	p-Value
LFDI	0.003415	0.01507	0.226561	0.8233
LBMS	-0.388801	0.12436	-3.126279	0.0058
TO	-0.013496	0.00494	-2.730074	0.0137
INF	0.002277	0.00185	1.228329	0.2351
CPI	0.016809	0.00285	5.890898	0.0000
EXR	-0.029093	0.00204	-14.19823	0.0000
CointEq(-1)*	-0.524535	0.05833	-8.991615	0.0000

Notes: (1) 1% level = ###, 5% level = ## and 10% level of significance =

(Indicates the significance of all p -values at the respective degree of freedom).

An ARDL model with a leg setup of 1, 2, 0, 0, 2, 1, and 2 is created using AIC criterion. Examining the short-run association between GDP and independent variables, Table 5 shows the outcomes of ECM. All other factors—aside from FDI and inflation—have a considerable short-term impact on GDP growth.

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During the study period, the immediate effects of Broad Money Supply, TO, and EXCR on GDP growth remained deflationary, but CPI had a positive and considerable short-term impact on economic growth. Which is a worry that has to be properly handled. Last but not least, the speed of adjustment (ECM t-1) displays a negative sign with a 5% level of significance, confirming the model's long-term stability. The model is suggested to be non-explosive by the coefficient of error correction term. If disequilibrium arises, endogenous variables adjust at the rate of the ECM coefficient (0.52), and the model reaches the long-run equilibrium with the specified set of determinants.

The results of Table 5, therefore, indicate that, in the short run, CPI leads to GDP growth, whereas Broad Money Supply, TO, EXCR lead to the economic slowdown. Furthermore, a positive correlation between inflation, FDI and GDP has been found, but its immediate effects are negligible.

Table 6. Other Diagnostic Tests after ARDL

Test Statistics	p-Value	Interpretation
Breusch–Godfrey serial correlation LM test	0.3028	No Serial Correlation
Heteroscedasticity test: Breusch–Pagan -Godfrey	0.9909	No Heteroscedasticity
Jarque–Bera test	0.83859	Residuals Normally distributed
Ramsey RESET test t-Statistic (17)	0.1510	Dependent and independent variables relationship is correctly specified
F-Statistic (1, 17)	0.1510	

Notes: (1) 1% level = ###, 5% level = ## and 10% level of significance = # (Indicates the significance of all p -values at the respective degree of freedom).

(2) Breusch–Godfrey's serial correlation test, Breusch–Pagan– Godfrey's test, Jarque–Bera's test and Ramsey's RESET test accept the null hypothesis.

(3) Decisions are taken on the basis of p-values.

Table 6's findings show that the model accepts the null hypotheses of homoscedasticity, normal distribution, and the absence of autocorrelation, and that the relationship between dependent and independent variables is appropriately stated.

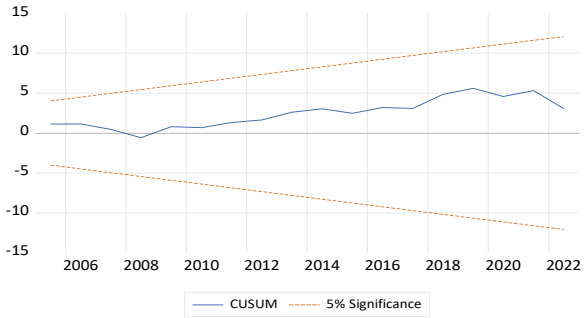

Figure 1. Graphical Representation of Cumulative Sum of Recursive Residuals (CUSUM Test)

. **Note:** The straight lines denote critical bound at 5% significance level

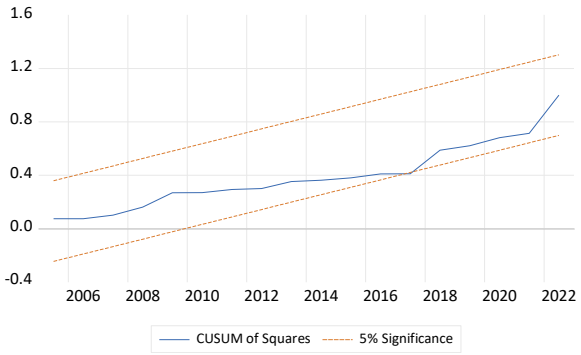

Figure 2. Graphical Representation of Cumulative Sum of Squares of Recursive Residuals (CUSUMQ Test)

Source: The authors.

Note: The straight lines denote critical bound at 5% significance level.

The long-run stability in parameters is then verified using the CUSUM test. Figures 1 and 2 show the outcomes of CUSUM and CUSUMQ test, respectively. Figures 1 and 2 clearly show that all of the parameters exhibit long-run stability at a 5% level of significance.

V. CONCLUSIONS

The ARDL model's findings indicate that there may be significant differences between the short- and long-term effects of particular factors on GDP growth. FDI, broad money supply, trade openness, exchange rate, CPI, and inflation rate have been identified in the current study as predictors of economic growth based on the body of literature. The impact of these factors on economic growth between 1990 and 2022 was examined using time-series data in the paper.

The study's findings indicate a long-term, positive, and significant relationship between broad money supply and CPI and economic growth. Yet, there is an inverse relationship between trade openness and exchange rate and economic growth. Similarly, only CPI has a favorable short-term effect on economic growth. On the other hand, the relationship between GDP and the broad money supply, trade openness, and exchange rate is unfavorable and important in the near term. The long-term impact of FDI and inflation on India's economic growth, however, is shown to be uncertain. Additionally, all other determinants—aside from inflation and FDI—have a short-term positive or negative impact on economic growth. It is evident from the short-run and long-run results that broad money supply and CPI are both vital determinants of economic growth. Therefore, reasonable use of infusion of the money supply may further help in achieving sustainable economic growth. But the primary concern is CPI has a negligible positive impact on the growth rate. Unlike FDI and inflations in economic growth have remained insignificant. Indeed, in a developing country like India, broad money supply can also play a key role in the long-run economic growth. Therefore, by facilitating investment, low interest-rates and collateral free loans, the government may be able tomobilisee the idle resources, which may further lead to long-run economic growth. Correspondingly, by improving the export avenues, exchange rate stability may also be achieved. Exchange rate stability can also be attained by expanding export opportunities.

POLICY RECOMMENDATIONS

According to the study's findings, the CPI and broad money supply are two important factors that influence India's economic growth over the long term. In fact, in a democratic nation like India, how the government spends its money reflects how it functions. Hence, the government may be able to draw in more foreign direct investment (FDI) by ensuring the broad money supply is efficient. The report suggests that the government use all resources, whether they are produced domestically or imported, effectively and productively. Without the constructive contribution of foreign commerce, resource mobilization in a developing nation like India becomes sluggish, which may further contribute to poor economic progress. In order to promote export, it is important to emphasize the role that trade openness plays. Even if the CPI and growth rate are favorably and significantly correlated, the Indian economy is nevertheless very concerned about this issue. The institutional framework and respect to the rule of law must be strong for corruption to have a beneficial impact on growth. Enhancing the performance of the legal system, public utilities, and other governmental institutions is actually a crucial first step in reducing corrupt activities.

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