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Globalisation, Trade and Economic growth in India: An ARDL Approach

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Abstract

This study uses time series data from 1975 to 2022 to examine how foreign trade affects India's economic growth. This study also examines and estimates the effects of globalization and economic changes on economic growth. To accomplish this goal, the Autoregressive Distributed Lag technique has been applied while taking into account the Bounds test, the Error Correction Mechanism, the Diagnostics statistics, and the Optimal Lag length criterion. This study is a step forward to analyse the impact of trade on economic growth. In this study, exports and imports of products, as well as exports and imports of services, have all been studied as independent variables. The bound test approach's results validate the long-term link between the variables. The model's coefficients are shown to be stable and the long-term relationships between the variables are validated by the cumulative sum test (CUSUM and CUSUMSQ).

Keywords: Economic growth, Trade, Globalisation, Co-integration, ARDL
JEL Classification F1, F 10, F 14

INTRODUCTION

Political economists like David Ricardo and Adam Smith were among the first to grasp the significance of international trade. The World Bank asserts that trade is a development engine that boosts economic opportunity, lowers poverty, and produces jobs. It is widely acknowledged that trade on a global scale may significantly boost economic growth and reduce poverty. Countries can access commodities and services that might not otherwise be available domestically

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and can grow their markets through international trade. This means that a country can concentrate its output on areas where it excels or where it has natural resources, and then trade any excess to a different country that excels in a different field. In addition to boosting productivity, international trade enables nations to take part in the global economy, which promotes the possibility of foreign direct investment. Because of its connections to every area of the economy, trade is vital to the expansion and development of nations. By establishing marketplaces that allow products and services to reach consumers, trade benefits the manufacturing, service, and agricultural sectors. So, it offers an avenue via which several participants in the economy can experience the benefits of economic expansion.

Midway through the 1980s, Rajiv Gandhi saw how important it was to liberalize and open up the economy in order to take advantage of the globalization and liberalization trend. Following India's decision to alter its economic policies in response to the 1991–1992 economic crisis, the liberalization movement gained pace. In July 1991, the Indian government introduced significant reforms, particularly in the areas of trade, industry, and fiscal policy. As a result, the Export-Import (EXIM) Policy underwent considerable revisions, and export promotion initiatives were implemented for both commodities and nation-specific purposes.

India's economy has benefited since liberalization, mostly as a result of increasing foreign trade. India's 1950s exports were primarily dependent on agriculture. There were strong import restrictions in place at this time, and achieving self-sufficiency was prioritized. However several actions were taken in the 1960s to boost India's exports. Both the export promotion policies and the relative ease of imports were implemented. Consequently, there was an increase in the export of produced goods. From 45% in 1960–1961 to 50% in 1970–1971 and roughly 59% in 1980–81, manufactured items accounted for an increasing portion of overall exports. A rise in foreign investment and rapid economic growth resulted from these reforms, which also included lowering taxes and deregulating markets and import tariffs. Foreign investment rose by 316.9% between 1992 and 2005, while India's GDP surged from $266 billion in 1991 to $2.3 trillion in 2018. India is expected to have exported USD 62.26 billion in total in October 2023, a 9.43% increase from October 2022. The expected total value of imports in October 2023 is USD 79.35 billion, a rise of 11.10 percent over October 2022.

Therefore, the purpose of this paper is to examine how, from 1975 and 2022, foreign trade affected India's economic growth both before and after reform. In order to adjust for time shocks and policy dynamics (years after and before the 1991 Economic Reforms), a dummy variable has been used as an

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addition to the body of literature on this topic. A combination of several variables has also been used to produce enlightening results.

Review of Literature

International trade's effect on India's economic growth was studied by Abubakar et al. (2015). It was shown that there was a negative and statistically significant link between imports and the GDP exchange rate. In contrast, the short-run relationship between imports and exchange rate was found to be negative but statistically insignificant. The short-run relationship estimation result indicates a positive and substantial association between exports and domestic investment with GDP.

The study conducted by Adeel-Farooq et al. (2017) investigated the impact of trade liberalization and financial liberalization on the economic growth of India and Pakistan between 1985 and 2014. The results show that while financial liberalization has a favorable influence on Pakistan's economic growth only in the long run, trade openness has a positive effect both in the short and long term. Both financial liberalization and trade openness have a beneficial and considerable long-term impact on India's economic growth.

Javed, Zahoor Hussain, et al. (2012) looked at the effects of inflation, terms of trade, trade openness, total exports to GDP ratio, and imports to GDP on Pakistan's economic growth. The estimated findings demonstrate that the explanatory variables significantly and favorably affect Pakistan's economy. It comes to the conclusion that commerce with other countries might significantly boost Pakistan's economy.

Mujahid, Nooreen, et al. (2016) use time series data covering the years 1971–2013 to investigate the relationship between export growth and economic growth in the context of Pakistan. The analysis came to the conclusion that there is a positive correlation between GDP and independent variables like imports and exports. Therefore, in order to encourage economic growth, the government should work to increase both imports and exports.

In their study, Pradhan et al. (2015) showed that increased trade openness can substantially accelerate India's economic expansion. In order to ensure India's economy continues to grow sustainably, officials should promote the long-term development of financial markets as well as freer trade.

The relationship between India's exports, imports, and economic development from 1980 to 2019 was studied by Reddy, K. Krishna (2020). The results of the study supported the long-term association between exports,

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imports, and economic growth. They also revealed a unidirectional short-term causal relationship between economic growth and exports, exports and imports, and imports and economic growth. In conclusion, the findings of the study suggest that India's economic growth is boosted by both imports and exports.

Sahu et al. (2018) used an Autoregressive Distributed Lag (ARDL) Bound testing approach to investigate the dynamic influence of openness on inflation in India. Overall, there is a positive correlation seen in both the short- and long-term between openness and inflation.

Using the ARDL cointegration method, Sunde et al. (2023) investigated the effects of trade openness, imports, and exports on Namibia's economic growth. The findings indicate that imports and economic growth have a strong negative association, whereas exports and trade openness have positive and significant relationships with economic growth. Moreover, trade openness, imports, and exports are the main drivers of short-term economic growth. The results imply that trade liberalization and growth driven by exports are essential to Namibia's economic progress.

Objectives and Hypothesis

Examining how foreign trade affects India's economic growth is the study's goal. The study takes into account exports and imports of services as well as exports and imports of products independently in order to calculate the effects of both on per capita income in India for goods and services. This goal was studied using models for situations with and without control variables. This study also analyses and estimates the effects of globalization and economic reforms on economic growth. It is assumed that India's economic growth will not be significantly impacted by imports and exports of commodities and services.

Data, Variables and Methodology

Secondary time series data were selected with the study's objectives in mind and are used in this investigation. The annual time series data utilized in the analysis, which covered the years 1975 through 2022, came from the World Development Indicators, Economic Survey of India, International Monetary Fund, and EPWRF India Time Series. Total labour employed and total capital creation act as the control variables. The GDPPC has been employed as a stand-in for economic activity. A dummy variable has been applied for economic reforms, where $D = 0$ if $Year<1991$ and $D = 1$ if $Year\geq1991$.

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The study's variables are presented in natural logarithmic form, with the exception of the dummy variable. The relevant statistical analytic tools are employed to analyse the gathered information and ascertain the impact of global trade on India's economic expansion. E-views, a statistical software, is used to analyse the data.

Table-1 below provides a summary analysis of the many variables taken into account in the proposed study.

Table 1: Analysis of Variables

S. No.	Variable Name andUse	Specification/Measurement	Expected algebraicsign with dependent variable
1.	Gross Domestic Product Per capita (GDPPC) Dependent variable	Economic growth of India	--
2.	Export of goods (GEXP) Independent variable	Goods produced in one country butsupplied to buyers in another country	Positive
3.	Import of goods (GIMP) Independent variable	Purchasing of foreign products andbringing them into one‘s home country	Positive
4.	Export of services (SEXP) Independent variable	Services produced in one country butsupplied to buyers in another country	Positive
5.	Import of services (SIMP) Independent variable	Purchasing of foreign services and bringing them into one‘s home country	Positive
6.	Economic reforms (D) Dummy Variable	Policy changes that aim to improvecountry‘s economic efficiency	--
7.	Workforce (EMP) Control variable	Total number of labour employed	Positive
8.	Gross Capital Formation (GCF) Control variable	Aggregate of gross additions to fixedassets	Positive

The stages below have been taken into consideration with regard to the methodology:

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Unit Root Test

The Phillips Perron (PP) and Augmented Dickey Fuller (ADF) tests have been run to see if the data for the current research unit root is stationary. One of two methods—one with an intercept only and the other with an intercept and a trend—is used in this work to estimate the Unit Root tests.

Optimum Lag Length Selection

Various methods have been employed to ascertain the optimal lag length, including the sequential modified LR test statistic, the final prediction error, the Akaike information criterion, the Schwarz information criterion, and the Hannan-Quinn information criterion.

ARDL Model

The current research uses the ARDL approach developed by Pesaran et al. (2002) to estimate the co-integration of a series. In investigating the relationship between the variables, the functional form of the models are specified as below: The models can be described as below:

Model I $LNGDPPC_t = \alpha + \beta_1 LNGEXP_{it} + \beta_2 LNGIMP_{it} + \beta_3 LNSEXP_{it} + \beta_4 LNSIMP_{it} + \beta_5 D_{it} + \varepsilon_{it}$

Model II $LNGDPPC_t = \alpha + \beta_1 LNGEXP_{it} + \beta_2 LNGIMP_{it} + \beta_3 LNSEXP_{it} + \beta_4 LNSIMP_{it} + \beta_5 D_{it} + \beta_5 LNEMP_{it} + \beta_6 LNGCF_{it} + \varepsilon_{it}$

To check the existence of long run relationship, the ARDL Model can be expressed in the long run form as shown below:

Model I $LNGDPPC_t = \beta_0 + \sum_{i=1}^{m1} \beta_{1i} LNGDPPC_{t-i} + \sum_{i=1}^{m2} \beta_{2i} LNGEXP_{t-i} + \sum_{i=1}^{m3} \beta_{3i} LNGIMP_{t-i} + \sum_{i=1}^{m4} \beta_{4i} LNSEXP_{t-i} + \sum_{i=1}^{m5} \beta_{5i} LNSIMP_{t-i} + \sum_{i=1}^{m6} \beta_{6i} D_{t-i} + \mu'_t$

Model II $LNGDPPC_t = \beta_0 + \sum_{i=1}^{m1} \beta_{1i} LNGDPPC_{t-i} + \sum_{i=1}^{m2} \beta_{2i} LNGEXP_{t-i} + \sum_{i=1}^{m3} \beta_{3i} LNGIMP_{t-i} + \sum_{i=1}^{m4} \beta_{4i} LNSEXP_{t-i} + \sum_{i=1}^{m5} \beta_{5i} LNSIMP_{t-i} + \sum_{i=1}^{m6} \beta_{6i} D_{t-i} + \sum_{i=1}^{m7} \beta_{7i} LNEMP_{t-i} + \sum_{i=1}^{m8} \beta_{8i} LNGCF_{t+i} + \mu'_t$

In case of the short run impact of independent variables on economic growth, the short run form of ARDL Model can be shown as below:

Model I $\Delta LNGDPPC = \alpha_0 + \sum_{i=1}^{n1} \alpha_{1i} \Delta LNGDPPC_{t-I} + \sum^{n2} \alpha_{2i} \Delta LNGEXP_{t-I} + \sum_{i=1}^{n3} \alpha_{3i} \Delta LNGIMP_{t-i} + \sum_{i=1}^{n4} \alpha_{4i} \Delta LNSEXP_{t-i} + \sum_{i=1}^{n5} \alpha_{5i} \Delta LNSIMP_{t-i} + \sum_{i=1}^{n6} \alpha_{6i} \Delta D_{t-I} + \sum_{i=1}^{n7} \alpha_{7i} \Delta LNEMP_{t-i} + \sum_{i=1}^{n8} \alpha_{8i} \Delta LNGCF_{t-i} + \gamma ECM_{t-1} + e'_t$

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Model II $\Delta LNGDPPC = \alpha_0 + \sum_{i=1}^{n1} \alpha_{1i} \Delta LNGDPPC_{t-i} + \sum_{i=1}^{n2} \alpha_{2i} \Delta LNGEXP_{t-i} + \sum_{i=1}^{n3} \alpha_{3i} \Delta LNGIMP_{t-i} + \sum_{i=1}^{n4} \alpha_{4i} \Delta LNSEXP_{t-i} + \sum_{i=1}^{n5} \alpha_{5i} \Delta LNSIMP_{t-i} + \sum_{i=1}^{n6} \alpha_{6i} \Delta D_{t-I} + \sum_{i=1}^{n7} \alpha_{7i} \Delta LNEMP_{t-i} + \sum_{i=1}^{n8} \alpha_{8i} \Delta LNGCF_{t-i} + \gamma ECM_{t-1} + e'_t$

Diagnostic Statistics

Testing has been done on the proposed data to verify the efficacy and coherence of the model using residual diagnostics, stability diagnostics and co-efficient diagnostics.

Analysis of Results

First, a matrix describing the variables and their correlation is established. The outcomes are shown in Table 2 below:

Table 2: Descriptive Statistics

	GDPPC	GEXP	GIMP	SEXP	SIMP	EMP	GCF
Mean	787.1150	1.16E+11	1.70E+11	6.29E+10	4.00E+10	221.5847	3.09E+11
Median	427.9250	3.63E+10	4.56E+10	1.31E+10	1.59E+10	226.2866	1.64E+11
Maximum	2301.410	4.58E+11	7.25E+11	3.09E+11	1.77E+11	246.1572	9.99E+11
Minimum	157.9300	4.67E+09	4.62E+09	8.41E+08	1.05E+09	183.8925	3.30E+10
Std. Dev.	657.0131	1.35E+11	2.06E+11	8.22E+10	4.60E+10	18.8304	2.93E+11
Skewness	0.9833	0.9562	1.0037	1.1888	1.1324	-0.7054	0.8585
Kurtosis	2.5038	2.4415	2.5770	3.3052	3.2885	2.3047	2.3121
Jarque-Bera	8.2280	7.9395	8.4181	11.4931	10.4257	4.9479	6.8436
Probability	0.0163	0.0188	0.0148	0.0031	0.0054	0.0842	0.0326

Source: Author‘s calculation.

The pairwise correlation coefficients in Table 3 illustrate the strength of the association between some variables and others.

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Table-3: Correlation Matrix

	LNGDPPC	LNGEXP	LNGIMP	LNSEXP	LNSIMP	LNGCF	LNEMP
LNGDPPC	1.000						
LNGEXP	0.979	1.000					
LNGIMP	0.985	0.995	1.000				
LNSEXP	0.984	0.994	0.994	1.000			
LNSIMP	0.971	0.989	0.988	0.992	1.000		
LNGCF	0.981	0.996	0.990	0.993	0.990	1.000	
LNEMP	-0.867	-0.800	-0.819	-0.797	-0.773	-0.802	1.000

Source: Author‘s Calculation

The computed regression model seem not to have any multi-collinearity problems. None of the pairwise correlation coefficients between independent variables is 1.

The Unit Root test was examined using the Augmented Dickey Fuller (1981) and Phillips & Perron (1988) tests, and Table 4 presents the findings. According to the findings, the independent variables are a combination of orders I (0) and I (1), but the dependent variable is integrated of order I (1) Globalisation, Trade and Economic growth in India:An ARDL Approach

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Table 4: Results of Unit Root Test

Variable	Augmented Dickey Fuller Test				Phillips Perron Test			
	At Level		At First Difference		At Level		At First Difference	
	Intercept	Trend & Intercept	Intercept	Trend & Intercept	Intercept	Trend & Intercept	Intercept	Trend & Intercept
D	-1.406 (0.571)	-1.605 (0.775)	-6.782 (0.000)	-6.767 (0.000)	-1.405 (0.571)	-1.640 (0.761)	-6.782 (0.000)	-6.767 (0.000)
LNGDPPC	0.061 (0.959)	-1.301 (0.875)	-6.582 (0.000)	-6.515 (0.000)	-0.010 (0.952)	-1.493 (0.817)	-6.638 (0.000)	-6.576 (0.000)
LNGEXP	-0.343 (0.910)	-1.921 (0.624)	-3.691 (0.008)	-3.731 (0.032)	-0.356 (0.907)	-1.900 (0.638)	-6.215 (0.000)	-6.143 (0.000)
LNGIMP	-0.510 (0.879)	-2.289 (0.430)	-5.376 (0.000)	-5.337 (0.000)	-0.531 (0.875)	-2.012 (0.579)	-5.376 (0.000)	-5.337 (0.000)
LNSEXP	-0.225 (0.927)	-1.889 (0.643)	-4.348 (0.001)	-4.269 (0.007)	-0.550 (0.871)	-1.696 (0.737)	-4.348 (0.001)	-4.269 (0.007)
LNSIMP	-1.002 (0.745)	-3.002 (0.142)	-5.038 (0.000)	-5.074 (0.000)	-1.054 (0.726)	-2.389 (0.380)	-5.029 (0.000)	-4.991 (0.001)
LNGCF	-0.384 (0.903)	-2.542 (0.542)	-7.517 (0.000)	-7.426 (0.000)	-0.374 (0.905)	-2.080 (0.542)	-7.506 (0.000)	-7.418 (0.000)
LNEMP	-1.073 (0.718)	-2.177 (0.490)	-5.449 (0.000)	-5.411 (0.000)	-0.929 (0.770)	-2.152 (0.504)	-7.648 (0.000)	-7.418 (0.000)

Source: Author‘s calculation
Note – The values in the parenthesis are the probability values

The stationary test demonstrated that the order of variable integration was either at level I (0) or after the first difference, I (1), confirming the lack of second-order integrated variables. Therefore, the conditions for utilizing the ARDL are satisfied.

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Lag order selection criteria

The optimal lag length in this study for Model I and Model II was chosen to be 4 and 3 based on the many lag length selection criteria that were taken into consideration.

Co-integration Test

For both models, the anticipated results are shown in Table 7. The alternative hypothesis asserts that co-integration exists, in contrast to the null hypothesis, which claims that it does not.

Table 7: Results of ARDL Bounds Testing

Model	Test Name	Test Value	Significance level	I(0)	I(1)	Decision
I	F-Statistic k	12.309 5	10% 5% 2.5% 1%	2. 2.86 3.25 3.74	3.52 4.01 4.49 5.06	Reject H_0 Co-integration exists
II	F-Statistic k	6.842 7	10% 5% 2.5% 1%	2.03 2.32 2.6 2.96	3.13 3.5 3.84 4.26	Reject H_0 Co-integration exists

Source: Author‘s calculation

The parameter k, as shown in Table 7, is simply equal to the total variables minus one. The calculated F statistic for both the models lies outside the upper bound I (1) values at all significant levels, indicating co-integration among the variables in both models.

Table 8: Estimates of ARDL Model: Long Run

Variable	Model I			Model II		
	Coefficient	**t-Statistic**	**Probability**	**Coefficient**	**t-Statistic**	**Probability**
LNGEXP	0.315	1.029	0.314	0.166	0.617	0.543
LNGIMP	-0.164	-0.626	0.537	-0.127	-0.739	0.467
LNSEXP	0.184	1.248	0.224	0.263	2.791	0.010
LNSIMP	0.303	2.162	0.041	0.018	0.172	0.864
D01	-0.374	-3.697	0.001	-0.266	-3.909	0.000
LNEMP	-	-	-	-0.775	-2.909	0.008
LNGCF				0.285	1.473	0.155

Source: Author‘s calculation

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As per Table 8, there is no long-term correlation seen between the variables GEXP, GIMP, and SEXP in Model I with economic growth. Conversely, the variable SIMP exhibits long-run ARDL model coefficients that are significant at the 5% level of significance and possess the expected signs. When control variables are included in Model II, only SEXP has statistical significance. The values of the Dummy variable's coefficients (-0.374 and -0.266) in both models likewise demonstrate that the autonomous growth exhibits a declining tendency as a result of the economic changes implemented throughout the relevant study period.

Table 9 displays the findings from the estimation of the error correction model (ECM), which examines short-run dynamics.

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Table 9: Estimates of ARDL Model: Short Run

Variable	Model I			Model II		
	Coefficient	**t-Statistic**	**Probability**	**Coefficient**	**t-Statistic**	**Probability**
C	-3.408	-9.462	0.000	-2.891	-8.501	0.000
D(LNGDPPC(-1))	-0.253	-2.696	0.012	-	-	-
D(LNGEXP)	-0.196	-2.151	0.042	-0.219	-3.224	0.004
D(LNGEXP(-1))	-0.205	-2.351	0.027	-0.260	-3.210	0.004
D(LNGEXP(-2))	-0.129	-1.475	0.153	-0.282	-4.479	0.000
D(LNGIMP)	0.324	4.384	0.000	0.229	4.163	0.000
D(LNGIMP(-1))	0.174	2.253	0.034	0.098	1.558	0.134
D(LNGIMP(-2))	0.135	1.643	0.113	0.235	4.591	0.000
(LNGIMP(-3))	0.131	2.969	0.006	-	-	-
D(LNSEXP)	-0.228	-3.062	0.005	-0.163	-2.706	0.013
D(LNSEXP(-1))	-0.244	-2.948	0.007	-0.230	-3.185	0.004
D(LNSEXP(-2))	-0.279	-3.833	0.000	-0.256	-4.045	0.000
D(LNSIMP)	0.463	6.672	0.000	0.209	3.894	0.000
D(LNSIMP(-1))	0.097	1.313	0.202	0.176	2.762	0.011
D(LNSIMP(-2))	0.139	2.223	0.036	0.138	2.543	0.018
D(D01)	-	-	-	-0.108	-3.349	0.003
D(LNEMP)	-	-	-	-0.027	-0.263	0.794
D(LNGCF)	-	-	-	0.371	5.250	0.000
CointEq(-1)*	**-0.405**	-9.482	0.000	**-0.693**	-8.543	0.000
R^2			0.914			0.939
Adjusted R^2			0.869			0.904
F statistic	20.091		0.000	26.997		0.000

Source: Author‘s calculation

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Moreover, the data demonstrate that GEXP and SEXP, whether from the previous year or the current one, have a noteworthy, although unfavourable, effect on economic growth in Model I and Model II. In Model II, the SIMP and economic growth are significantly correlated for each year; whereas, in Model I, the SIMP has a strong beneficial impact on economic growth just for the present year. In contrast, GIMP has a positive and significant impact on economic growth in Model I, regardless of whether the data is from the prior or current year; but, in Model II, GIMP's impact is limited to the current year. Additionally, the autonomous growth exhibits a declining trend in the short term, as indicated by the value of the coefficient of the Dummy variable.

Diagnostic and Stability Tests

The Jarque-Bera test findings for histogram normality are displayed in Figures -1 and -2.

Model I

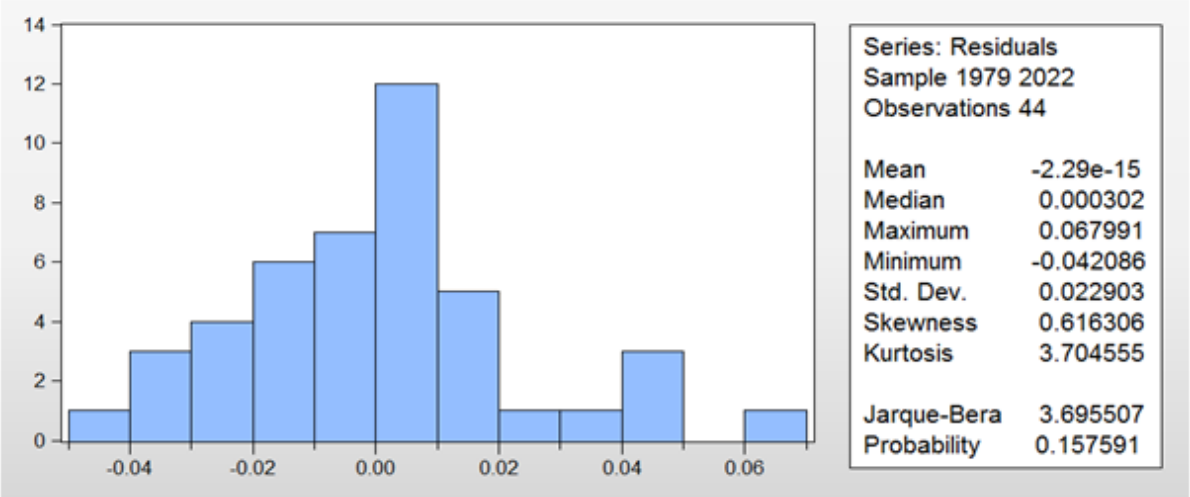

Figure 1: Histogram - Normality Test

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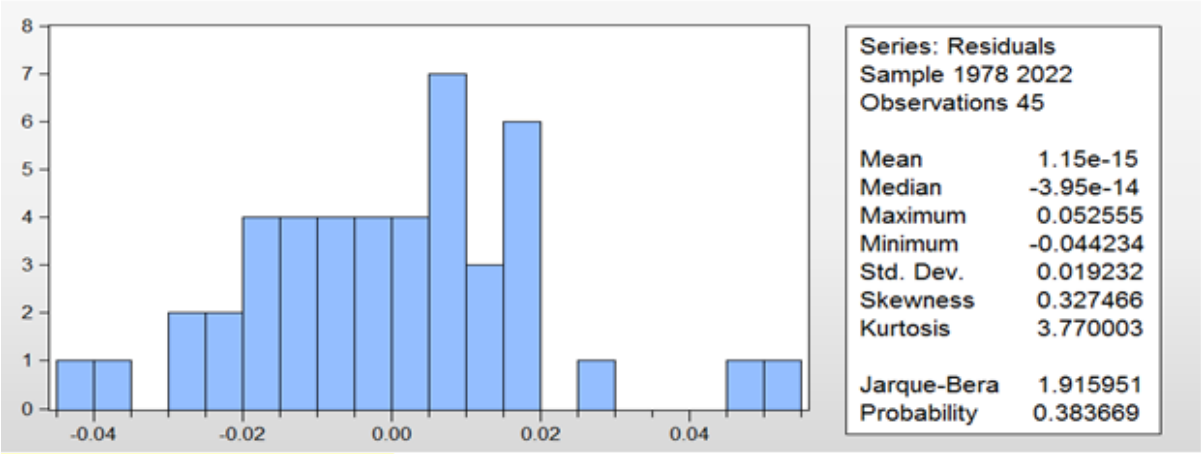
Model II



Source: Author‘s Calculation

Figure 2: Histogram - Normality Test

Since the ρ value in both models is larger than 5%, according to the data, the null hypothesis which claims that the residuals are normally distributed, cannot be rejected.

Table 11: Serial Correlation LM test

Model	Test Name	Test Value	Probability	Null hypothesis	Decision
I	Breush-Godfrey	F statistic = 0.308 $N*R^2$ = 1.256	0.737 0.533	No serial correlation at up to2 lags	H_0 Accepted. Noserial correlationpresent.
II	Breush-Godfrey	F statistic = 0.154 $N*R^2$ = 0.719	0.858 0.697	No serial correlation at up to2 lags	H_0 Accepted. Noserial correlationpresent.

Source: Author‘s Calculation

The results of Table-11 indicates that the values of F-statistic and N*R2 are not statistically significant and thus the null hypothesis of no serial correlation is accepted.

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Table 12: Heteroscedasticity test

Model	Test Name	Test Value	Probability	Null hypothesis	Decision
I	Breush-Pagan-Godfrey	F-Statistic = 0.604 N*R Squared = 15.156	0.870 0.767	Homoscedasticity	H_0 Accepted. No Heteroscedasticity
II	Breush-Pagan-Godfrey	F-Statistic = 0.653 N*R Squared = 18.775	0.839 0.714	Homoscedasticity	H_0 Accepted. No Heteroscedasticity

Source: Author‘s Calculation

Table 12 shows that, based on the values of the F statistic and N*R2, there is no heteroscedasticity in any of the estimated models, thus the estimated models can be deemed suitable based on the results of this test.

Table 13: Regression equation specification error test

Model	Test Name	Test Value	Probability	Null hypothesis	Decision
I	Ramsey RESET test	t – statistic = 0.012 F – statistic = 0.000	0.989 0.989	No specification error	H_0 Accepted
II	Ramsey RESET test	t – statistic = 2.037 F – statistic = 4.153	0.055 0.055	No specification error	H_0 Accepted

Source: Author‘s Calculation

It is evident from the applied tests of t-Statistic and F-Statistic in both models that the values are determined to be statistically significant, indicating that the null hypothesis must be accepted and that the model's results do not contain specification errors.

The CUSUM and CUSUM of Squares Tests have been used to assess the models' stability. The findings are displayed in Figures 3, 4, 5, and 6. The stability of the examined model is demonstrated by the CUSUM and CUSUMSQ plots in the accompanying figures, which show that the designs are within a 95% confidence interval. The assessed model is therefore trustworthy for deriving unbiased statistical results and formulating plans.

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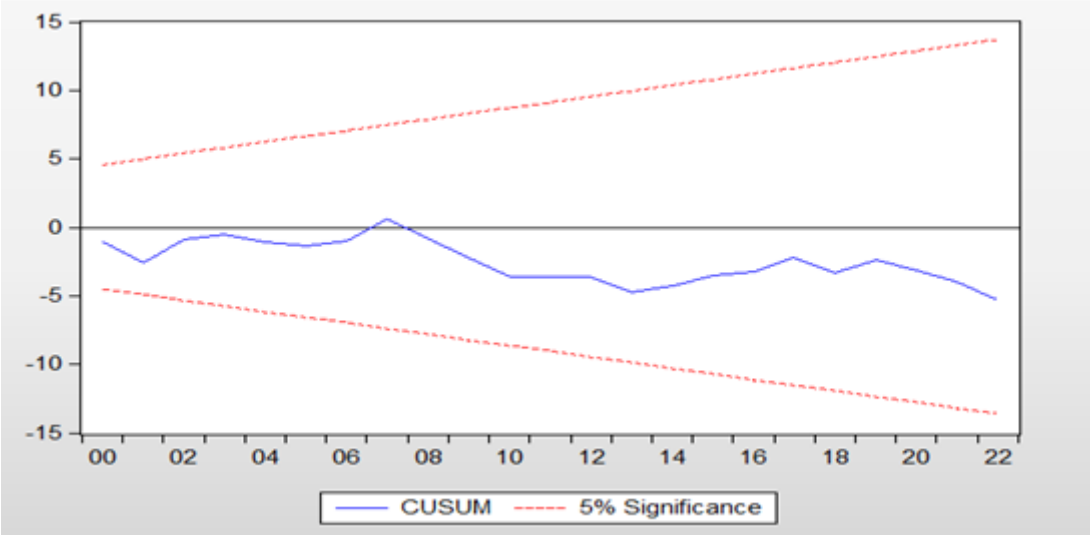

Figure 3: Plot of Cumulative Sum of Recursive Residuals Model I

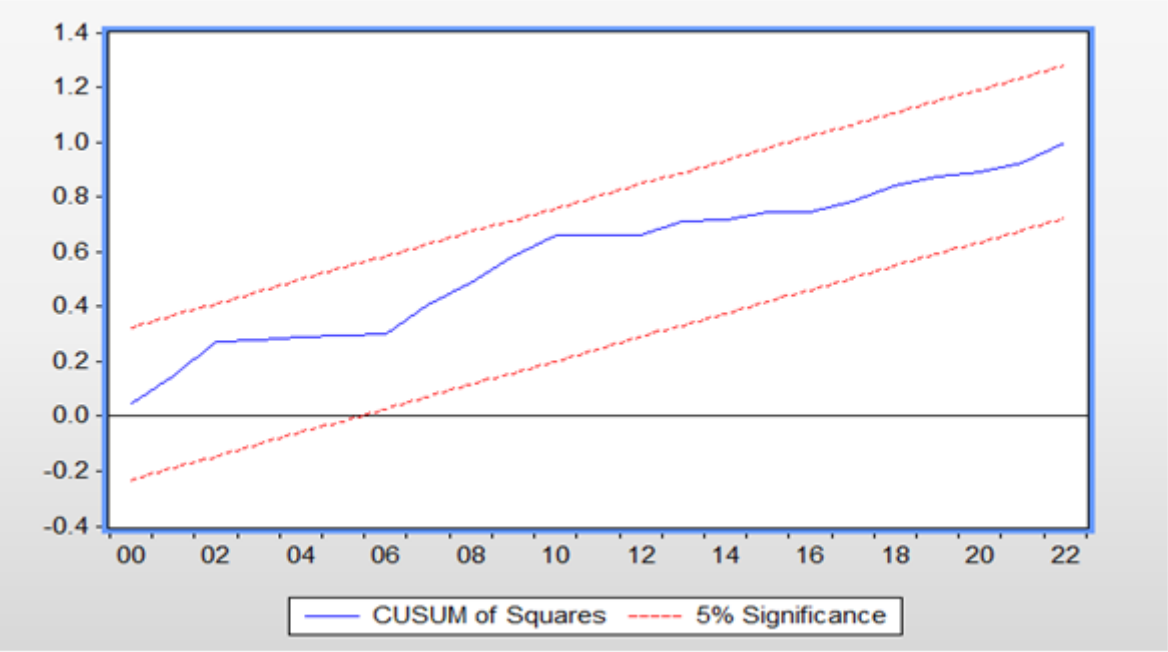

Figure 4: Plot of Cumulative Sum of Squares of Recursive Residuals Model I

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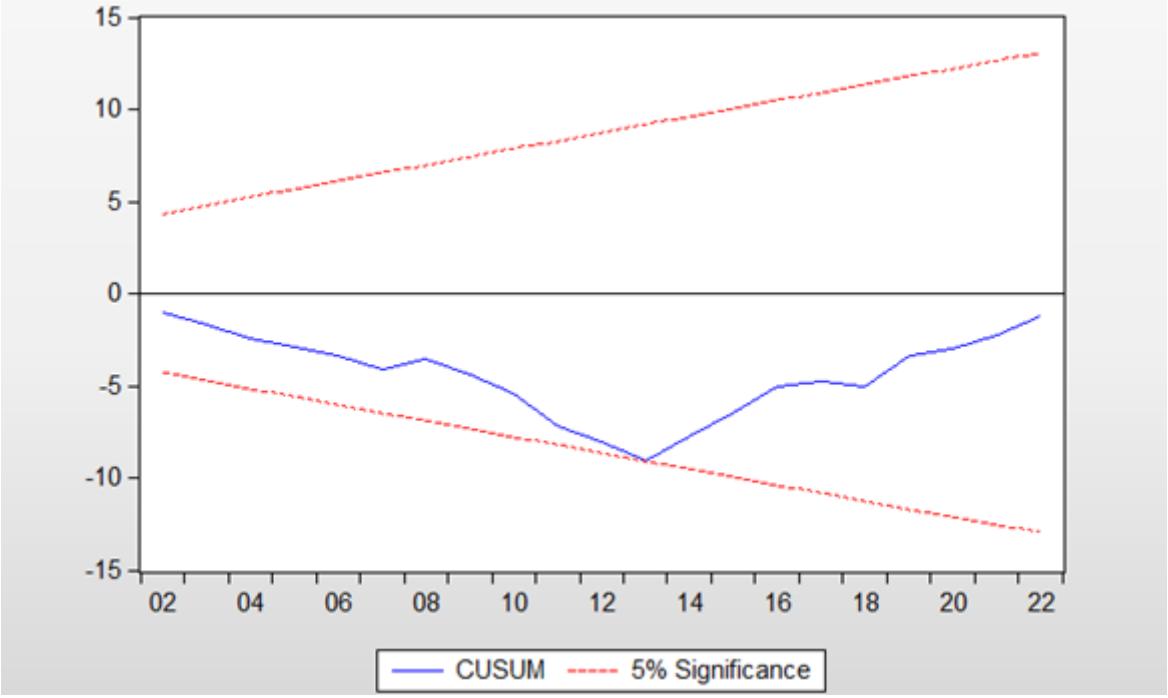

Figure 5: Plot of Cumulative Sum of Recursive Residuals Model II

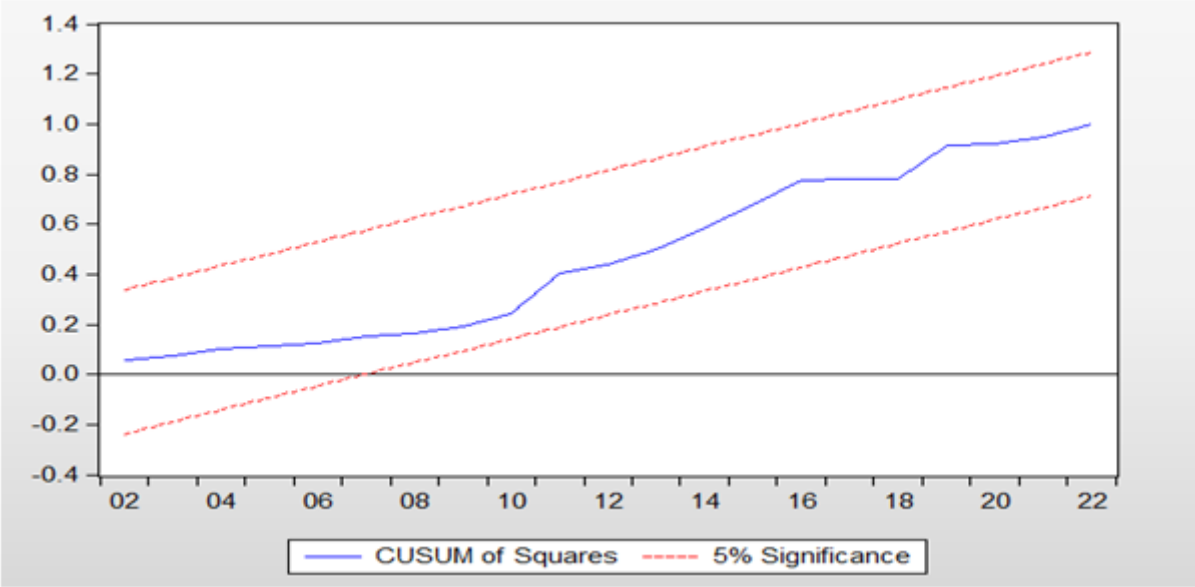

Figure 6: Plot of Cumulative Sum of Squares of Recursive Residuals Model II

As can be seen, the plot in figure 3, 4, 5 and 6 remains inside the critical 5% constraints (dotted lines), confirming the long-term link between the variables and demonstrating the stability of the coefficients.

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Findings and Implications

Using time series data from 1975 to 2022, the main objective of this study is to investigate the impact of exports and imports of goods and services taken separately on the economic growth of India.

Based on empirical analysis, it can be concluded that while service exports may have a substantial impact on India's economic growth when control variables are used, the long-term effects of products export, imports of goods, and imports of services do not significantly affect the country's economic growth. Furthermore, as the data show, both GEXP and SEXP from the prior year and the current one have a notable, although unfavourable, impact on economic growth. Conversely, SIMP has a large positive influence on economic growth, and GIMP has a favourable and considerable impact on economic growth. Therefore, rather than emphasizing short-term policies, the government should focus more on crafting long-term ones.

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