TRADE OPENNESS AND ECONOMIC GROWTH NEXUS: EVIDENCE FROM INDIA

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ABSTRACT: *This study empirically investigates the dynamic relationship between trade openness and economic growth for India in a multivariate framework. The study has used Johansen cointegration test and Granger Causality test in Vector Error Correction Model (VECM) framework to examine the export-led growth hypothesis, import-led growth hypothesis, and trade-led growth hypothesis. The results show that the direction of causality runs from exports to economic growth, imports to economic growth, and trade openness to economic growth. The study also found a bi-directional causality between foreign direct investment and economic growth. Therefore, it is suggested that the policymakers should adopt policies towards further trade liberalization and should focus both on export promotion and export diversification strategy and improve the investment climate and attract investments from both domestic and foreign investors to sustain economic growth in the long run.*

Keywords: Trade openness, Economic growth, Exports, Imports, Causality

1. INTRODUCTION

International trade has been one of the most important drivers of economic growth during the last few decades. The benefits of international trade are an efficient use of resources, availability of commodities at lower prices, and a wider choice of consumption [1]. The unprecedented growth of trade among the economies of the world can be attributed to the process of trade liberalization [2]. There is an increase in Regional Trade Agreements (RTAs) between countries since the early 1990s to cater to their growth and development needs [3].

Economic expansion and trade liberalization significantly promote international trade and thereby improve welfare [4]. India has turned from a rather closed economy into a nation strongly into the world economy [5]. It introduced a series of economic reforms to open up the economy and liberalize trade in the early 1990s [6]. However, with the advent of a new wave of globalization and the gradual reduction of trade barriers, India has made remarkable economic progress. The contribution of trade to India's GDP is continuously rising. It has shown impressive growth performance in the recent past. In absolute terms, India's share in world exports is consistently rising. India is the nineteenth-largest exporter (with a share of 1.7%) and the tenth-largest importer (with a share of 2.6%) of merchandise trade in the world in 2018-19. The cumulative value of exports and imports in 2018-19 was USD 331.02 billion and USD 507.44 billion respectively. India's merchandise exports noted a compound annual growth rate of 7.09 percent from 2009-10 to 2018-19.

India has been rather late in adopting the policy of bilateral and regional free trade agreements [7]. India has started strengthening the movement of the South Asian Association for Regional Cooperation (SAARC) countries toward a South Asian Free Trade Agreement (SAFTA) [8]. It has also started signing Free Trade Agreements (FTAs) with several Asian countries after the 2000s to forge deeper economic cooperation agreements. Exports have assumed an important place in the development of an economy and its performance plays a pivotal role in the development process [9]. With the introduction of market-oriented policies in the 1980s and 1990s, the Indian economy has witnessed rapid economic growth in the recent past. Its trade as a percentage of GDP, exports and imports of goods and services as a percentage of GDP have increased progressively since then. India has shown remarkable economic growth in the recent past and has contributed significantly to higher global economic output. Due to the increasing domestic and international demand for output, it has started to produce more output in the international market. After the trade liberalization in the 1990s India's exports of goods and services as a percentage of GDP increased from 7.05% in 1990 to 18.66% in 2019 and imports of goods and services as a percentage of GDP increased from 8.45% in 1990 to 21.36% in 2019. The total trade as a percentage of GDP increased from 15.51% in 1990 to 40.02% in 2019. Against this backdrop, this study empirically investigates the impact of trade openness on the economic growth of India by incorporating the key economic variables for the period, 1970 to 2019.

The rest of this article includes both the theoretical and empirical literature on trade openness and economic growth, an explanation of the methodology and data sources that have been used to fulfil the objectives of the study, an analysis of the empirical results of the study, and the conclusion of the study.

2. LITERATURE REVIEW

The relationship between trade openness and economic growth has been examined widely both in the theoretical and empirical literature. Several studies have focused on understanding the causality between trade openness and economic growth and most of them supported the argument that trade openness stimulates economic growth [10, 11]. However, a strand of literature contradicts the positive impact of openness on economic growth [12, 13]. These debatable findings also appear in the empirical literature. On the empirical front, numerous studies have examined the relationship between trade openness and economic growth using time series and panel techniques. The evidence from the literature is varied and ddiffersacross methodologies and countries. Many studies have hypothesized the Trade Led Growth (TLG), Export-Led Growth (ELG), and Import Led Growth proposition.

Among the studies on trade openness and economic growth in India, [14] have investigated the relationship between economic growth, export growth, export instability, and investment from the period 1971 to 2005 for India. The results showed that all variables have a positive impact on GDP in the long run and there exists a unidirectional causality from exports to economic growth. [15] empirically

investigates the causality between openness and economic growth from the period 1950 to 2008 for India using techniques of the Cointegration test and Vector Error Correction Model (VECM) and has found a positive relationship between trade openness and economic growth. [16] examined the dynamic causal relationships between economic growth, trade openness, and financial sector depth in India from the period 1994 to 2011. Using ARDL and VECM approaches the study found that the variables are cointegrated and that trade openness, economic growth, and financial sector depth Granger cause each other. [17], over the period 1982 to 2014, have found bi-directional causality between economic growth and trade openness in India. [18] investigate the long-run relationship and direction of causality among economic growth, trade openness, and gross capital formation among BRICSs nations. The results revealed that a 1 percent increase in trade openness increases the GDP of India by 0.10 percent and that there is unidirectional causality from trade openness to economic growth in India. Maitra (2020), over the period 1996 to 2017, has found evidence of ILG both in the short run and long run respectively, however, the study found the support of ELG only in the short run.

Apart from these studies on the Indian economy, the trade-led growth relation has been extensively researched in the context of many other nations both developed and developing economies. Among others, [19] examined the relationship between openness and economic growth for Pakistan's economy by using Granger causality from the period 1960 to 2001. The results indicated a long-run relationship between openness and economic growth however, no such causality was seen in the short run. [20] examined the relationship between export and economic growth in the Malaysian economy from 1960 to 2005 using techniques of cointegration and error correction models. The findings of the study indicated a positive relationship between export and economic growth in the long run and short run. [21] tested the export-led growth hypothesis for Turkey using quarterly data from 1989 to 2006. The findings of the study confirmed the export-led growth hypothesis. They found unidirectional causal flow running from real exports to real GDP. [22] confirmed the validity of the openness-led growth hypothesis for Sri Lanka from the period 1965 to 2012 using the autoregressive distributed lag (ARDL) bounds test for cointegration. [23] investigated the relationship among foreign direct investment, domestic investment, trade openness, and economic growth in Bangladesh for the period 1976 to 2014 using the Vector Error Correction Model (VECM) framework. The causality results however found a unidirectional causality from growth to trade openness. [24] empirically investigates the relationship between trade liberalization and economic growth in Afghanistan for the period 1995 to 2016 using ARDL, JJ Cointegration and OLS methods. The results revealed the significant positive long run relationship between exports and economic growth and that causality runs from exports to economic growth. However, the study also found that the total volume of trade and imports have significant negative effect on the economic growth, whereas in this case causality runs from economic growth to total trade and imports.

3. DATA AND METHODOLOGY

The relationship between trade openness and economic growth has been studied for India. The following definitions are used: to capture the economic growth of the country, GDP per capita at constant 2010 US$ is used. Trade openness measure constitutes various aspects of trade. This study has used three different indicators of trade openness which include total trade as a percentage of GDP to measure trade openness, export of goods and services as a percentage of GDP to measure export openness, and import of goods and services as a percentage of GDP to measure import openness. Such disaggregation aims to examine the effect of all these trade flows separately on the GDP per capita. Investment also channelizes the economic growth of a country and thus, the gross fixed capital formation as a percentage of GDP has been included in the model. Foreign direct investment also plays a fundamental role in the economic growth of a country thus, FDI net inflows (% of GDP) have also been included in the model. This study uses annual time series data covering the period from 1970 to 2019 for India. The choice of a sample period is dominated by the consistent availability of the data for all variables. The data were collected from the World Bank's World Development Indicators [25]. Natural logs of all these variables are used for the econometric analysis.

3.1 Econometric Model

The empirical literature on trade openness and economic growth has used a variety of econometric techniques to analyze the relationship between them. Panel data analysis, cross-section analysis, and time series analysis have been used in a variety of studies. The present study will employ the time series technique to analyze the relationship between trade openness and economic growth for India.

The equation of interest for the study is the GDPPC as a function of other variables. Symbolically,

$$GDPPC = f(TOPN, EXP, IMP, GFCF, FDI) \quad (1)$$

Where,

LGDPPC = Log of GDP per capita

LTOPN = Log of trade as a percentage of GDP

LEXP = Log of exports of goods and services as a percentage of GDP LIMP = Log of imports of goods and services as a percentage of GDP

LGFCF = Log of Gross Fixed Capital Formation as a percentage of GDP

LFDI = Log of Foreign Direct Investment, net inflows percentage of GDP

The empirical model for estimation is specified in a log form and it can be illustrated as follows

$$LGDPPC = a_0 + a_1 LTOPN + a_2 LEXP + a_3 LIMP + a_4 LGFCF + a_5 LFDI + \varepsilon_t \quad (2)$$

Where α_i(i = 0, 1, 2, 3, 4, 5) are the parameters to be estimated, ε_t is the disturbance term and the subscript t is the time period

.

The error correction form of equation (2) is written as

$$\begin{bmatrix} \Delta LGDPPC_t \\ \Delta LTOPN_t \\ \Delta LEXP_t \\ \Delta LIMP_t \\ \Delta LGFCF_t \\ \Delta LFDI_t \end{bmatrix} = \begin{bmatrix} \Delta a_0 \\ \Delta \beta_0 \\ \Delta \gamma_0 \\ \Delta \delta_0 \\ \Delta \lambda_0 \\ \Delta \omega_0 \end{bmatrix} + \sum_{i=1}^{m} \begin{bmatrix} \alpha_{1i} + \alpha_{2i} + \alpha_{3i} + \alpha_{4i} + \alpha_{5i} + \alpha_{6i} \\ \beta_{1i} + \beta_{2i} + \beta_{3i} + \beta_{4i} + \beta_{5i} + \beta_{6i} \\ \gamma_{1i} + \gamma_{2i} + \gamma_{3i} + \gamma_{4i} + \gamma_{5i} + \gamma_{6i} \\ \delta_{1i} + \delta_{2i} + \delta_{3i} + \delta_{4i} + \delta_{5i} + \delta_{6i} \\ \lambda_{1i} + \lambda_{2i} + \lambda_{3i} + \lambda_{4i} + \lambda_{5i} + \lambda_{6i} \\ \omega_{1i} + \omega_{2i} + \omega_{3i} + \omega_{4i} + \omega_{5i} + \omega_{6i} \end{bmatrix} \begin{bmatrix} \Delta \mathrm{LGDPPC}_{t-i} \\ \Delta \mathrm{LTOPN}_{t-i} \\ \Delta \mathrm{LEXP}_{t-i} \\ \Delta \mathrm{LIMP}_{t-i} \\ \Delta \mathrm{LGFCF}_{t-i} \\ \Delta \mathrm{LFDI}_{t-i} \end{bmatrix} + \begin{bmatrix} \Delta a_1 \\ \Delta \beta_2 \\ \Delta \gamma_3 \\ \Delta \delta_4 \\ \Delta \lambda_5 \\ \Delta \omega_6 \end{bmatrix} [\mathrm{ECT}_{t-1}] + \begin{bmatrix} \Delta \mu_t \\ \Delta \varepsilon_t \\ \Delta V_t \\ \Delta W_t \\ \Delta \rho_t \\ \Delta \phi_t \end{bmatrix} \quad (3)$$

Where $\mu_t, \varepsilon_t, V_t, W_t, \rho_t, \phi_t$ are residuals in period t, with zero mean and constant variance. Δ is the first difference operator, α, β, γ, δ, λ, ω, are short run parameters, and m is the lag length chosen based on the lag length criteria. ECTs are the error correction terms that are the stationary residuals generated from the long run cointegrating of Johansen multivariate process representing a disequilibrium position in period t. in other words, ECTs represent the adjustment of variables towards a long run equilibrium value. The coefficients α_1, β_2, γ_3, δ_4, λ_5, ω_6, are the short run adjustment coefficients.

4. RESULTS AND DISCUSSION

The empirical results are analysed in the following sub-sections.

4.1 Unit Root Test

The empirical analysis begins with the specification of the stationary and the order of the integration of the selected variables. Augmented Dickey-Fuller (ADF) test and Phillips-Perron test (PP) were employed to check the stationarity of LGDPPC, LTOPN, LEXP, LIMP, LGFCF, and LFDI. The unit root test results are presented in Table 1. The test results revealed that the null hypothesis of having a unit root in each of the variables at the level is accepted (taking the assumptions 'intercept' and 'intercept and trend') because the p-value is greater than the 5% level of significance. This confirms the non-stationary of these variables at the level. However, upon first differencing of the variables LGDPPC, LTOPN, LIMP, LGFCF, and LFDI, we failed to accept the null hypothesis of unit root, meaning that the variables have become stationary at first difference. The variable LEXPs intercept term in the ADF test result at the first difference is not significant at the 5 per cent level of significance as the p-value is a little above 5 per cent. However, the result of the PP test has shown that it is significant at 5 per cent. The Phillips-Perron (PP) test results also show that all six variables are stationary at first difference. The results of the PP test results are consistent with the ADF test results. Thus, the order of integration of each of these variables is one, that is, these are I (1) stationary. Thus, we could test for the presence of cointegration among these variables using the Johansen Cointegration Test.

Table 1: Results of unit root tests

Variables	Deterministic	Level		First Difference	
		ADF	PP	ADF	PP
LGDPPC	Intercept	3.211 (1.000)	9.410 (1.000)	-4.810* (0.000)	-4.810* (0.000)
	Intercept and trend	-1.176 (0.901)	-1.024 (0.928)	-6.158* (0.000)	-12.650* (0.000)
LTOPN	Intercept	-0.720 (0.829)	-0.795 (0.809)	-4.996* (0.000)	-5.041* (0.000)
	Intercept and trend	-0.915 (0.943)	-1.446 (0.830)	-4.974* (0.001)	-5.004* (0.001)
LEXP	Intercept	-0.994 (0.745)	-1.004 (0.742)	-2.891** (0.055)	-6.260* (0.000)
	Intercept and trend	-0.726 (0.963)	-1.120 (0.912)	-6.266* (0.000)	-6.304* (0.000)
LIMP	Intercept	-0.578 (0.864)	-0.702 (0.834)	-4.763* (0.000)	-4.754* (0.000)
	Intercept and trend	-1.308 (0.871)	-1.845 (0.663)	-4.683* (0.003)	-4.661* (0.003)
LGFCF	Intercept	-1.570 (0.488)	-1.567 (0.489)	-6.942* (0.000)	-6.897* (0.000)
	Intercept and trend	-1.277 (0.878)	-1.436 (0.833)	-7.113* (0.000)	-7.100* (0.000)
LFDI	Intercept	-0.905 (0.775)	-0.604 (0.858)	-6.588* (0.000)	-7.605* (0.000)
	Intercept and trend	-3.104 (0.119)	-3.104 (0.119)	-4.541* (0.005)	-7.516* (0.000)

Notes: (1) * and ** represent significance at 5% and 10% Respectively.
(2) Values in parentheses are p-value

4.2 Lag Order Selection

To identify the number of optimal lags, normal unrestricted Vector Autoregressive (VAR) is used for optimal lag lengths of the series. The lags for the model were chosen based on the Akaike information criterion (AIC), Schwarz information criterion (SIC), Hannan-Quinn information criterion (HIQ), and Final prediction error (FPE) criterion. The results are presented in Table 2. The majority of the methods have chosen lag 3 as an optimal lag for the model to be estimated. Only the Schwarz information criterion (SIC) has chosen a lag of 1 for the model. Based on these results, a lag of 3 was chosen as an optimal lag for the model.

Table 2: VAR Lag order selection criteria

Lag	LogL	LR	FPE	AIC	SIC	HIQ
0	229.1864	NA	2.32e-13	-12.06413	-11.80290	-11.97203
1	441.7938	344.7688	1.71e-17	-21.61048	-19.78187*	-20.96581
2	489.3146	61.64856	1.07e-17	-22.23322	-18.83723	-21.03597
3	542.7598	52.00080*	6.62e-18*	-23.17621*	-18.21284	-21.42639*

Notes: (1) LR: sequential modified LR test statistic (each test at 5% level); Akaike information criterion (AIC); Schwarz information criterion (SIC); Hannan-Quinn information criterion (HIQ); Final prediction error (FPE).
(2) * indicates lag order selected by the criterion.

4.3 Cointegration Test

Upon finding the non-stationarity property of selected variables a study of cointegration is essential to confirm the long run relationship. Accordingly, the Johansen cointegration test based on Trace and Maximum Eigenvalue statistic was employed to infer whether there exist long run relationships among the variables. The null hypothesis 'no cointegration', implying the variables are not cointegrated, is tested against the alternative hypothesis 'at most one' cointegrating relationship. The two different types of test statistics that are Trace Statistics and Maximum Eigenvalue Statistics obtained through EViews 10 software are presented in Table 3 and Table 4.

Both the Trace and Maximum Eigenvalue test statistics, therefore, reject the null hypothesis of no cointegrating relation at a 5 per cent level of significance, thus confirming the existence of long run relationships among the variables. Similarly, to confirm whether more than one cointegrating relation is present, the null hypothesis 'at most one' cointegrating relation against 'at most two' cointegrating relation. We fail to accept the null hypothesis of 'at most one' cointegrating relation, thus confirming the presence of 'at most two' cointegrating relation. In the same manner, we have tested the presence of 'more than two' cointegrating relations and have found support for the hypothesis.

Thus, the unrestricted cointegration rank tests based on Trace statistics and Maximum eigenvalue statistics indicate that there exist three cointegrating relationships. The test results of the Maximum Eigenvalue statistic are consistent with the Trace statistic as both the test statistics show the existence of three co-integrating equations.

Table 3: Johansen Cointegration Test Results of Trace Statistic

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.867622	193.6201	95.75366	0.0000
At most 1 *	0.767855	120.8247	69.81889	0.0000
At most 2 *	0.674779	68.25059	47.85613	0.0002
At most 3	0.400201	27.81358	29.79707	0.0833
At most 4	0.181826	9.411798	15.49471	0.3287
At most 5	0.058950	2.187309	3.841466	0.1392

Notes: (1) Trace test indicates 3 cointegrating eqn(s) at the 0.05 level.
(2) * denotes rejection of the hypothesis at the 0.05 level.

Table 4: Johansen Cointegration Test Results of Maximum Eigenvalue Statistic

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.867622	72.79542	40.07757	0.0000
At most 1 *	0.767855	52.57410	33.87687	0.0001
At most 2 *	0.674779	40.43701	27.58434	0.0007
At most 3	0.400201	18.40178	21.13162	0.1155
At most 4	0.181826	7.224489	14.26460	0.4629
At most 5	0.058950	2.187309	3.841466	0.1392

Notes: (1) Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level.
(2) * denotes rejection of the hypothesis at the 0.05 level.

4.4 Vector Error Correction Model and Short run Dynamics

Based on the Johansen cointegration test results of three cointegration relations, we estimated a Vector Error Correction Model to examine the short run and long run causal relationship between cointegrating variables. The significance of the error correction term (ECT) determines the long run relationship, and the lagged coefficients of the independent variables demonstrate the short run causal relationship at the convenient level of significance.

The cointegration and vector error correction equation of the LGDPPC, LTOPN, LEXP, LIMP, LGFCF, and LFDI can be estimated as given below. The error correction terms, and the number of lags is introduced as per the cointegrating vectors. The coefficients for the VECM of each variable are presented in Table 5. The first error correction term is significant, but it has a positive sign. The second error correction term has a wrong sign and is also insignificant. The third error correction term has a correct negative sign; however, it is found to be insignificant. The results, therefore, do not suggest the existence of long run causality among these variables. The first and second lags of LTOPN have a significant positive effect on the LGDPPC. However, the first and second lags of LEXP and LIMP have a significant positive impact on LGDPPC, while the second lag of LFDI has a significant negative impact on LGDPPC. The first and

second lags of LGFCF and the first lag of LFDI are not significant. Thus, total trade, exports, imports, FDI, and economic growth in India display short run causal relationships. The results are consistent with the findings of [26]

Table 5: Estimates of Vector Error Correction Model

Variable	Coefficient	Std. Error	t-statistic	Prob.
ECT 1	0.025569*	0.006439	3.971178	0.0007
ECT 2	9.553285	5.830654	1.638459	0.1162
ECT 3	-4.350986	2.684329	-1.620884	0.1200
D (LGDPPC (-1))	-0.194323	0.251881	-0.771486	0.4490
D (LGDPPC (-2))	-0.648132*	0.250460	-2.587769	0.0172
D (LTOPN (-1))	8.708429*	3.284975	-2.650988	0.0149
D (LTOPN (-2))	8.129596*	2.407545	-3.376717	0.0028
D (LEXP (-1))	3.935864*	1.475620	2.667262	0.0144
D (LEXP (-2))	3.669433*	1.079346	3.399683	0.0027
D (LIMP (-1))	4.729051*	1.802800	2.623170	0.0159
D (LIMP (-2))	4.401767*	1.325122	3.321782	0.0032
D (LGFCF (-1))	-0.048099	0.059304	-0.811063	0.4264
D (LGFCF (-2))	0.118426	0.070915	1.669984	0.1098
D (LFDI (-1))	-0.000125	0.005622	-0.022288	0.9824
D (LFDI (-2))	-0.018651*	0.007858	-2.373388	0.0272
Constant	0.081140	0.017517	4.632081	0.0001

Note: * denote statistical significance at 5%.

4.5 Diagnostic and Stability Test

The study has conducted a battery of diagnostic tests to examine whether the estimated model is well fitted or not. For Serial Correlation, the Breusch-Godfrey Serial Correlation LM test is done with Null hypothesis: No serial correlation is present in the residuals, for Normality, the Jarque-Bera test is done with Null hypothesis: Residuals are normally distributed, and for Heteroscedasticity, the Breusch-Pagan-Godfrey test is done with Null hypothesis: Residuals variance are all equal. These results are presented in Table 6. We failed to reject all these hypotheses of no serial correlation, residuals are normally distributed, and residuals variance are all equal at a 5 % level of significance. The model has passed these tests and it can be concluded that the estimated model is free from serial correlation; it is free from heteroscedasticity and non-normality.

Table 6: Diagnostic tests

Test types	Method used	Null hypothesis (H_0)	P-value
Serial correlation	Breusch-Godfrey Serial Correlation LM Test	No serial correlation	0.1329
Normality	Jarque-Bera Test	Normal distribution	0.3079
Heteroscedasticity	Breusch-Pagan-Godfrey Test	No heteroscedasticity	0.5585

To check the stability of the estimated parameters of the model cumulative sum (CUSUM), and the square of the cumulative sum (CUSUMQ) tests are performed. Figures 1 and 2 show the results of the CUSUM and CUSUMQ tests respectively. The residual plots lay within the critical bounds of a 5% level of significance. These residual plots indicate that there is stability in the parameters from the estimated model.

The Granger Causality test reveals whether there is a short run causal relationship among the variables included in the estimated VEC model. The test results based on previously estimated VECM are presented in Table 7. Total trade, exports, and imports show a causal relationship with the economic growth uni-directionally in the short run. The uni-directional causality runs from LOPEN to LGDPPC, LEXP to LGDPPC, LIMP to LGDPPC, and LFDI to LGDPPC. The direction of causality runs from exports and imports to economic growth thus supporting the validity of the Export-Led Growth (ELG) and Import-Led Growth (ILG) hypothesis in the short run in India. The results were in consonance with the findings of [27, 28]

Table 7: Granger Causality Test Based on VEC Model

Dependent variables	Chi-square Statistics					
	LGDPPC	**LTOPN**	**LEXP**	**LIMP**	**LGFCF**	**LFDI**
LGDPPC	—	0.335 (0.846)	0.946 (0.623)	0.094 (0.954)	3.493 (0.174)	6.159** (0.046)
LTOPN	12.527* (0.002)	—	1.956 (0.376)	0.579 (0.748)	0.153 (0.926)	10.209* (0.006)
LEXP	12.652* (0.002)	0.947 (0.623)	—	0.676 (0.713)	0.077 (0.962)	11.165* (0.004)
LIMP	12.141* (0.002)	0.792 (0.673)	1.882 (0.390)	—	0.208 (0.901)	9.671* (0.008)
LGFCF	4.382 (0.112)	5.672*** (0.059)	8.245** (0.016)	2.929 (0.231)	—	0.232633 (0.890)
LFDI	7.227** (0.027)	6.823** (0.033)	15.213* (0.001)	2.588 (0.274)	1.175 (0.556)	—

Notes: (1) Values in parenthesis are estimated p-values.
(2) *, **, and *** indicates significance at the 1%, 5%, and 10% respectively.

CONCLUSION

The current study investigated the dynamic interactions between trade openness and economic growth by incorporating several other economic variables in a multivariate framework over an extended period from 1970 to 2019. Appropriated econometric methods were used to serve the purposed of the study. The study found the existence of the long run relationship between the variables. The empirical results also confirmed the validity of the trade-led growth hypothesis, export-led growth hypothesis, and import-led growth hypothesis in the short run. The findings help in understanding the fact that exports and imports play a significant role in the economic growth of the country both in the long run and short run respectively. The results of the study are consistent with the findings of [29, 30, 26]

The conclusions of this research paper impart a multitude of implications for the policymakers in India. The findings of the study recommend that policymakers should prioritize further trade liberalization policies and focus on export promotion and export diversification such that the degree of trade openness can significantly raise and sustain the economic growth in India. Additionally, the positive influence of foreign direct investment on economic growth implies the requirement of an encouraging foreign direct investment policy that might bring higher economic growth in the long run. Finally, it also needs to fast-track reforms to improve the investment climate and attract investments from both domestic and foreign investors to facilitate economic growth. However, our research is limited to a few variables and there is a possibility that apart from the trade openness and economic growth, there are several other economic variables like exchange rate, inflation, and terms of trade that can affect the transmission between economic growth and trade openness in India. Therefore, in the future, it could be worthwhile to investigate the dynamic interactions between economic growth and trade openness by incorporating other macroeconomic variables.

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