

An Analysis on India's Foreign Trade during Post Liberalization Period

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ABSTRACT

The economic development of a country is largely influenced by its foreign trade and hence, it is considered as engine of economic growth. According to the classical theories of international trade developed by Adam Smith and David Ricardo, when a country enters in to foreign trade, it benefits from specialization and efficient resource allocation. It helps to produce commodities which have a cheaper cost and also helps to maintain favorable balance of payment position. The direction and composition of India's foreign trade has undergone many changes after the implementation of liberalization policy by Indian government in 1991.

The direction of India's foreign trade shows concentration of exports and imports to the countries of Asia and Oceania regions. The amount of India's international trade has grown in recent times, but the difference between imports and exports has also grown, which is represented in an expanding trade imbalance. With this backdrop the present study makes a moderate attempt to study the relationship between foreign trade and economic growth using cointegration analysis during post liberalisation period.

Keywords: Economic Growth, Export, Import, Cointegration

1. Introduction

A country has to be involved in activities like import and export to be in economic contact with another country. Capital shortage and saving gap that arise because of the insufficient income level in the underdeveloped or developing countries have interrupted the growth and development processes. Because of this, interaction between import and export that means foreign trade have taken complicated aspects and mutual cause and effect relations may be seen. Underdeveloped countries may ensure their economic development by importing their industrial and investment goods in exchange for income that they had gained from export. (Kilic & Beser, 2017). The argument concerning the role of exports as one of the main deterministic factors of

economic growth is not new. It goes back to the classical economic theories by Adam Smith and David Ricardo, who argued that international trade plays an important role in economic growth and that there are economic gains from specialisation. The argument of the neo-classical economists is that competition in international market promotes economies of scale and increases efficiency by concentrating resources in sectors in which the country has a comparative advantage. These positive externalities promote economic growth (Mishra, 2012). The neoclassical theory of international trade provides an unambiguous support to the economic and welfare gains of free trade. Paradoxically, the neoclassical theory of economic growth (Solow, 1956; Swan, 1956) does not recognise the role of trade in growth, and it assumes that the growth is driven by an increase in the use of factor inputs, capital and labour, and the exogenous improvements in technology (T. Singh, 2011).

It is found that though import has a negative influence on economic growth, the volume of trade reflected by economic openness have a positive impact on the economic growth of India and its magnitude is increasing continuously (A. P. Singh, 2014). Kilic & Beser, (2017) also argued that export and import are important determinants of economic growth in Eurasian countries. For this reason, countries need to increase the value given to import and implement export promoting practices will increase economic growth. Import is going to increase productivity by enabling to learn by doing and improve skill by following the modern technologies and it is going to cause to economic growth in conclusion (Grosman & Helpman, 1991). With this backdrop the fundamental objective of this research study is to examine the interlinkages between economic growth with export and import of India during post liberalisation period.

2. Objectives

- To study the direction of foreign trade in India.
- To analyse the relationship between foreign trade and economic growth in India during post liberalisation period.

3. Hypothesis

- There is a long run relationship between economic growth with Export and Import.

4. Methodology

The present research work is purely based on secondary data collected from Federal Reserve Economic Data, Trade map and Director General of Foreign Trade, Govt of India. The Quarterly data is collected for the period from 01-04-1996 to 01-04-2022. The collected data has been converted into logarithm form and the variables selected for the analysis are listed in Table 1.

Table 1: Variables of the Study

Variable	Frequency of Data	Time Period
GDP at Current Prices	Quarterly	01-04-1996 to 01-04-2022
Export	Quarterly	01-04-1996 to 01-04-2022
Import	Quarterly	01-04-1996 to 01-04-2022

Research Techniques Used

- ANOVA
- Johansen’s Methodology of Cointegration
- Vector Error Correction Model
- Granger Causality Test

5. Results and Discussion

Composition of trade means a study of the goods and services of imports and exports of a country. Direction of trade means a study of the countries to whom the exports are made and from whom the imports are made. Therefore, it indicates the structure and level of economic development of a country.

Table 2: Results of ANOVA Test for Export with Different Regions

Regions	N	Mean	Std. Deviation	Std. Error
SAARC	18	11306396.1111	6820998.51470	1607724.76807
ASEAN	18	20971256.4444	12054768.40054	2841336.16055
BRICS	18	17145908.7778	9493970.85169	2237750.38987
EU	18	36659049.7222	16268349.03388	3834486.64019
NAFTA	18	30610197.4444	15985048.26489	3767712.00857
OPEC	18	33382507.8333	19367119.61849	4564873.87143
Total	108	25012552.7222	16482522.24090	1586031.44212

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9055900061477930. 000	5	1811180012295586. 000	9.231	.000
Within Groups	20013168656643828 .000	102	196207535849449.3 80		
Total	29069068718121768 .000	107			

The Table 2 shows that there is a significant difference in India’s export level among different regions of the world. To check the regional difference in Export level of India, the present study has employed ANOVA test by considering SAARC, EU, NAFTA, BRICS, ASEAN and OPEC country regions. Since the probability value is 0.000 the result is statistically significant at 1% level of significance. Hence, it is concluded that there is a significant difference in India’s export level among different regions of the world selected by the study.

Table 3: Post Hoc Test Results for Export

Group	N	Subset for alpha = 0.05	
		1	2
SAARC	18	11306396.1111	
BRICS	18	17145908.7778	
ASEAN	18	20971256.4444	
NAFTA	18		30610197.4444
OPEC	18		33382507.8333
EU	18		36659049.7222
Sig.		.052	.226

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 18.000.

It is proved by the Duncan test results reported in Table 3 is that the Export is significantly less in the SAARC, BRICS and ASEAN regions and significantly high in the NAFTA, OPEC and EU regions.

Table 4: Results of ANOVA Test for Import with Different Regions

Regions	N	Mean	Std. Deviation	Std. Error
SAARC	18	81750116.7778	60710569.43472	14309618.44566
ASEAN	18	28041568.1111	16666927.90261	3928432.58049
BRICS	18	47403826.7222	31267877.17766	7369909.32854
EU	18	36189266.8333	14951129.31805	3524014.97573
NAFTA	18	20689873.2778	11174289.94263	2633805.39779
Total	90	42814930.3444	38383059.28936	4045929.69732

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	41196177205333408.000	4	10299044301333350.000	9.735	.000
Within Groups	89923895191233264.000	85	1057928178720391.000		
Total	131120072396566592.000	89			

The Table 4 infers that there is a significant difference in India’s import level among different regions of the world. To check the regional difference in Import level of India, the present study has employed ANOVA test by considering SAARC, EU, NAFTA, BRICS and ASEAN country regions. Since the probability value is 0.000 the result is statistically significant at 1% level of significance. Hence, it is concluded that there is a significant difference in India’s import level among different regions of the world selected by the study.

Table 5: Post Hoc Test Results for Import

Group	N	Subset for alpha = 0.05		
		1	2	3
NAFTA	18	20689873.2778		
AEAN	18	28041568.1111	28041568.1111	
EU	18	36189266.8333	36189266.8333	
BRICS	18		47403826.7222	
SAARC	18			81750116.7778
Sig.		.182	.095	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 18.000.

It is also proved by the Duncan test results reported in Table 5 is that the import is significantly less in the NAFTA, ASEAN and EU regions and significantly high in the SAARC region.

Unit Root Tests

Before going for Johansen Method of Cointegration, it is necessary to test whether all the variables that had taken into consideration fulfilled the properties of cointegrated series or not. Thus, to check whether all the variables considered integrated at same level, the ADF and PP tests were conducted and the results of which are presented in Table 6.

Table 6: Results of tests for Stationarity

Unit Root Test	Level	GDP	Export	Import	Residual
ADF Test	At Level	-2.769 (0.211)	-1.465 (0.835)	-1.720 (0.735)	-2.782 (0.005)
Phillips-Perron Test	At Level	-0.3408 (0.913)	-1.382 (0.860)	-1.706 (0.741)	-2.277 (0.022)
ADF Test	First Difference	-9.124 (0.000)	-11.352 (0.000)	-10.406 (0.000)	-
Phillips-Perron Test	First Difference	-13.552 (0.000)	-11.344 (0.000)	-10.417 (0.000)	-

From the Table 6, it is observed that, the series concerning GDP, Export and Import are stationarity at first difference. The results of both Augmented Dicky Fuller Test and Phillips-Perron Test are significant at 1 percent level of significance which implies that series are stationary at first difference.

In this model, the study has taken changes in GDP (Y_t) to be affected by changes in Export ($X1_t$) and Import ($X2_t$), which has been represented in the following equation:

$$Y_t = \beta_1 + \beta_2 X1_t + \beta_3 X2_t + e_t \dots\dots\dots(1)$$

From Equation 1, we are able to generate linear combination of the residuals which has been represented in the second equation

$$e_t = Y_t - \beta_1 - \beta_2 X1_t - \beta_3 X2_t \dots\dots\dots (2)$$

To test the stationarity of the residual series, which was generated through linear combination, Philips Perron Test and Augmented Dickey Fuller test were used. As test statistic of these tests represented in Table 6 is significant at 1 percent level of significance at level, it could be inferred that the series could be cointegrated.

Table 7: Results of Johansen’s Cointegration Test

Hypothesized No. of Cointegrated Equations	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.
None	0.273844	44.51873	24.27596	0.0000
At most 1	0.076402	12.51971	12.32090	0.0463
At most 2	0.044690	4.571927	4.129906	0.0386

The non-stationary time series data integrated of order one for GDP with Export and Import have been used for the cointegration analysis. The Johansen co-integration test was used to find the long-run relationship among these variables. It has been found from the co-integration test results reported in Table 7 is that the trace statistic has identified three cointegrating equations. Means, all the parameters used in this analysis have been cointegrating with each other. Accordingly, there has been long run stable relationship between GDP, Export and Import in India. Hence, GDP, Export and Import in India are inter-dependent.

Since, the series are cointegrated, we can use Vector Error Correction Model. If the cointegrated series are subject to any shock, Error correction models helps us in estimating the speed at which the dependent variable returns to equilibrium for a given change (shock) in other variables. Before running vector Error Correction model, it is necessary for us to estimate optimum lag. To estimate optimum lag, first and foremost we should run standard Vector Auto Regression taking all the variables. With that we can estimate optimum lag length criterion (Chetan Kumar et al., 2021). The estimates of optimum lag length criterion are summarized in Table 8.

Table 8: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	23.12146	NA	0.000133	-0.414876	-0.335245	-0.382677
1	459.8699	837.4764	1.96e-08*	-9.234431	-8.915910*	-9.105637*
2	467.3815	13.93904	2.02e-08	-9.203742	-8.646330	-8.978352
3	476.7605	16.82415	2.01e-08	-9.211556	-8.415254	-8.889570
4	487.0520	17.82445*	1.96e-08	-9.238185*	-8.202992	-8.819604
5	490.9269	6.471529	2.19e-08	-9.132513	-7.858430	-8.617336
6	494.5379	5.807397	2.46e-08	-9.021400	-7.508426	-8.409627
7	496.7876	3.478978	2.85e-08	-8.882219	-7.130354	-8.173851
8	501.2924	6.687514	3.17e-08	-8.789535	-6.798779	-7.984570

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

It is observed from the Table 8 is that FPE, SC and HQ tests suggested to use one lag. Since, majority of the criteria's suggested to use one lag, the results of Vector Error Correction model using one lag is summarized in Table 9.

Table 9: Results of Vector Error Correction Estimates

Error Correction:	D(LGDP)	D(LEXPORT)	D(LIMPORT)
CointEq1	-0.027617	0.016569	-0.081632
	(0.01328)	(0.02162)	(0.02618)
	[-2.07987]	[0.76642]	[-3.11790]
D(LGDP(-1))	-0.275882	-0.331623	-0.079540
	(0.13109)	(0.21344)	(0.25849)
	[-2.10445]	[-1.55368]	[-0.30771]
D(LEXPORT(-1))	0.006510	-0.087188	0.078592
	(0.08565)	(0.13945)	(0.16888)
	[0.07600]	[-0.62522]	[0.46537]
D(LIMPORT(-1))	0.067835	0.108956	0.035486
	(0.07889)	(0.12844)	(0.15555)
	[0.85989]	[0.84828]	[0.22813]
C	0.033863	0.044647	0.035440
	(0.00508)	(0.00828)	(0.01003)
	[6.66021]	[5.39336]	[3.53517]
R-squared	0.109032	Mean dependent var	0.028654
Adjusted R-squared	0.072666	S.D. dependent var	0.042979
S.E. of regression	0.041388	Akaike info criterion	-3.484316
Sum squared resid	0.167872	Schwarz criterion	-3.356417
Log likelihood	184.4423	Hannan-Quinn criter.	-3.432512
F-statistic	2.998194	Durbin-Watson stat	2.074542
Prob(F-statistic)	0.022156		

Note: Standard errors in () & t-statistics in []

The Vector Error Correction (VEC) model has been used to find the short-term disturbance in the long-run relationship and to identify the variable which responsible to restore the relationship. It helps us to estimate the speed at which the model will restore its equilibrium following any shocks or disturbances. When it comes to speed of adjustment or error correction

as displayed by Cointegrating Equation of Table 9, we observe that, 2.7 percent of disequilibrium is corrected every quarter. In addition, the negative error correction term in limport equation also supports the existence of a long run equilibrium relationship.

Table 10: Results of Long-Run Relationship between GDP with Export and Import

Cointegrating Eq:	CointEq1
LGDP(-1)	1.000000
LEXPORT(-1)	5.803640
	(0.92483)
	[-6.27534]
LIMPORT(-1)	-4.944074
	(0.91155)
	[5.42383]
c	-6.373882

Standard errors in () & t-statistics in []

The Table 10 presents the results of long-Run relationship between GDP with Export and Import. Lagged value of the export positively influenced on GDP. The coefficient value of export is 5.80, which means that as 1% increase in the export, GDP increases by 5.8%. It is also observed that import negatively influences on GDP during the study period as identified by (A. P. Singh, 2014).

6. Residual Diagnostic Tests

To ensure the stability of model, following tests were conducted and the results are summarised in the following headings.

Auto Correlation Test

Durbin Watson Test Statistic of the model is 2.07, which implies that there is no serious problem of Auto correlation in the model.

Heteroskedasticity Test

Table 11: VEC Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)

Joint test:		
Chi-sq	Df	Prob.
102.2940	84	0.0852

The results of the Heteroskedasticity are summarized in Table 11. Since Chi-Square statistic is insignificant, do not have enough evidence to reject null hypothesis and consequently it can be inferred that model is not suffering from Heteroskedasticity.

Table 12: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
LEXPORT does not Granger Cause LGDP	101	2.63342	0.0391
LGDP does not Granger Cause LEXPORT		0.70140	0.5930
LIMPORT does not Granger Cause LGDP	101	1.83597	0.1286
LGDP does not Granger Cause LIMPORT		0.25947	0.9032
LIMPORT does not Granger Cause LEXPORT	101	0.95337	0.4371
LEXPORT does not Granger Cause LIMPORT		3.58154	0.0092

It is found from the Table 12 is that there is a unidirectional relationship running from lexport to lGDP. The Granger Causality Test has been identified the causation of the Export on GDP in India. The causation from Export to GDP has also been identified by the several studies namely, Saaed and Majeed (2015), Ray, S. (2011) Amiri and Gerdtham (2011), etc. The result obtained is in accordance with the other studies. The result revealed that there is no causality between GDP and Import. It means GDP does not lead to Import and Import does not lead to GDP. The study

also found evidence of unidirectional causality running from Export to Import, it means in long term Export lead to Import but Import does not lead to Export.

7. Conclusion

The overall conclusion emerging from the analysis on India's foreign trade during post liberalization period is that, foreign trade significantly influences on economic growth. The objective of the research was to analyse whether, the GDP was cointegrated with Export and Import or not. From empirical study, it was concluded that the sectors are indeed cointegrated and interlinked.

After 1991 liberalisation policy the economy of India faced the problems of global economic crisis in 2008 and covid 19 during 2019-2021. These are the major shocks to India's foreign trade. However, due to Government fiscal efforts the foreign trade of India reverts back to equilibrium after shock. And it contributes to the growth of the Indian Economy.

The results from the empirical long run relationship lead to the conclusion that economic growth (GDP) is related to past deviations (error correction terms). It implies that economic growth has a tendency to quickly revert back to the equilibrium relationship. The causality running from Export to GDP in India provides the evidence of export driven growth over the study period. Hence, Government and monetary authority by adopting expansionary fiscal policy and monetary policy and allocating more credit to export oriented sector can further enhance growth of India to a great extent.

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