Exports, imports and economic growth in India: An empirical analysis

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Abstract. *The study examines the relationship between exports, imports and economic growth in India, spanning the period from 1980-2019. The study findings confirmed the long-run relationship among exports, imports and economic growth and also reported that there is a unidirectional causality from economic growth to exports; exports to economic growth; exports to imports; imports to economic growth in the short-run. In the long-run, author confirmed that there is a bidirectional causality relationship between economic growth and exports; and exports and imports. Finally, the study results indicate that both exports and imports increase economic growth in India.*

Keywords: India, trade, economic growth, cointegration, causality.

JEL Classification: C03, C32, F14.

1. Introduction

In the literature, there are many studies have conducted research on international trade. There results also inconclusive and there is a lot of scope to examine the relationship between international trade and its related sector. International trade includes both exports and imports, here when the countries have sufficient natural resources; those countries are exports goods and services to foreign countries and they can get foreign remittance further which will help to increase per-capita income of the people. Imports also increase per-capita income when countries have insufficient natural resource, they have to import natural resources or raw materials. Further they will use technology in the production process and export these goods and services to foreign countries, it will improve per-capita income. Therefore, we confirmed that international trade (exports and imports) increases economic growth.

In the existing literature, there are many studies have reported that international trade has a positive impact on economic growth, for example, Awokuse (2007); Erfani (1999); Vohra (2001); Shan and Sun (1999); Sultan and Haque (2011) for different countries.

In contrast, there are few studies have reported that international trade has a negative impact on economic growth. Moreover, the direction of causality also inconclusive, some studies have reported that there is a bidirectional causality between international trade and economic growth, see, Awokuse (2008); Hatemi-J (2002); Awokuse (2005). Some of them also reported that there is a unidirectional causality between the variables, see Çetintaş and Barişik (2009). A study by Tang (2006) could not established any long-run and short-run relationship between the international trade and economic growth.

International trade not only increase economic growth but also create job opportunities, increase per-capita income, improve infrastructure and increase economic scale. Based this international trade has a positive impact on economic growth. It implies that countries have well developmental plans, appropriate economic reforms, this will bring positive impact on economic growth, where international trade has a negative impact on economic growth. It implies that countries have not appropriate economic reforms, this may bring negative impact on economic growth. Those countries have need to improve their economic policies which is increase economic growth. The present study looks into Indian economy, whether international trade increase economic growth or not.

Given this background, the study examines the relationship between exports, imports and economic growth in India, spanning the period from 1970 to 2019. The applies ADF unit test to identify the stationarity properties, Johansen cointegration test to examines the long-run relationship between the variables and Granger causality test to identify the direction of causality between exports, imports and economic growth.

The rest of the paper is organised as follows: Section 2 reviews literature; Section 3 discusses the data and empirical methodology; Section 4 provides empirical analysis; and section 5 provides conclusions.

2. Review of literature

In the literature, there are many authors reported that international trade increase economic growth. International trade has a positive impact on economic growth. For example, a study by Kilavuz and Topcu (2012) examined the relationship between exports and economic growth for a panel of 22 development countries during the period of 1998-2006. They result indicate that growth of exports has a positive impact on economic growth. Awokuse (2007) studied the causality relationship between exports, imports and economic growth for a panel of transition economies, spanning the period from 1991:1-2004:3. His findings reported that exports and imports increases economic growth and also shows that international trade encourages economic growth. Ee (2016) used FMOLS techniques to examine the relationship between exports and economic growth for Sub-Saharan African countries covering the period from 1985-2014. Author findings confirmed that there is a long-run relationship between the variables and also reported that exports have a positive impact on economic growth. Gokmenoglu et al. (2015) studied the exports led growth hypothesis for Rica during the period of 1980-2013. The study results indicated that there is a long-run relationship between variable and also reported a unidirectional causality relation from economic growth to exports growth. Hye (2012) examined the relationship between exports, imports and economic growth for China covering the period from 1978-2009. The study results indicated that there is a long-run equilibrium relationship between exports, imports and economic growth. The empirical results also confirm the bidirectional long run relationship between the economic growth and imports, economic growth and exports, and exports and imports. Al-Khulaifi (2013) examined the relationship between exports, imports and economic growth for Qatar, spanning the period from 1980-2011. The study findings show that there is long-run relationship among exports, imports and economic growth. There is a unidirectional causality from imports to exports. Sultan Haque (2011) studied the relationship between exports, domestic investment and economic growth for India during the period of 1970-71 to 2007-08. The study exists the presence of long-run relationship between exports, domestic investment and economic growth. Exports and investments increase economic growth.

Kibria and Hossain (2020) investigated the relationship between exports and economic growth for Bangladesh covering the period from 1980-2018. They find a unidirectional causality from exports to economic growth and a bidirectional causality relationship between exports to economic growth. Raghuramapatruni and Surya Chaitanya (2020) examined the impact of international trade on economic growth for India, spanning the period 1991-2017. Their evidence indicated that international trade has a positive impact on economic growth and a unidirectional causality from exports to economic growth. Hassan (2020) studied the relationship between exports and economic growth for a panel of two groups namely MENA and South Asian countries during the period of 1990-2018. The findings confirmed that there is no long-run equilibrium relationship between the variables and a unidirectional causality from economic growth to exports. Hamdan (2016) studied the impact of exports, imports on economic growth for a panel of 17 countries, spanning the period 1995-2013. Author findings confirmed that exports and imports have a positive impact on economic growth. Bakari and Mabrouki (2016) studied the relationship between exports, imports and economic growth for Turley covering the period

from 1960 to 2015. Their results showed that there is no long-run relationship between exports, imports and economic growth and a unidirectional causality from exports to economic growth and imports to economic growth. Bakari and Krit (2017) examined the nexus between imports, exports and economic growth for Mauritania covering the period of 1960-2015. Their findings indicated the presence of long-run relationship between the variables. Exports have a positive impact on economic growth and imports have a negative impact on economic growth while there is a unidirectional causality from imports to economic growth. Zang and Baimbridge (2012) investigated the nexus between imports, exports and economic growth for both South Korea and Japan during the period of 1963-2003 and 1957-2003. They found a bidirectional causality relationship between imports and economic growth. Baharumshah and Rashid (1999) studied the causality relationship between exports, imports and economic growth for Malaysia covering the period 1970:1 – 1994:4. Their empirical results reported a bidirectional causality relationship exports and economic growth.

Given this background, in the literature, results are not uniform. Therefore, the present study examines the relationship between exports, imports and economic growth by updated data sets. The finding may useful for policy makers and academician.

3. Data and methodology

3.1. Data

The study uses data from 1970-2019 for India. Data on GDP per-capita 2010 constant US dollar is used as a proxy for economic growth, exports as a percentage of GDP is used as a proxy for exports and imports as a percentage of GDP used as a proxy for imports. The required data is collected from world development indicator published by World Bank.

3.2. Methodology

The study examines the relationship exports, imports and economic growth. For this purpose, author framed a model.

$$Y_t = f(EX_t, IM_t) \tag{1}$$

Where Y, EX, IM indicates economic growth, exports and imports, t is indicating time period.

The study examines the long-run relationship among economic growth, exports and imports and long-run equation is as follows.

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^{n} \ln\left(1 - \hat{\lambda}_i\right) \tag{2}$$

$$\lambda_{max}(r, r+1) = -T \ln\left(1 - \hat{\lambda}_{i+1}\right) \tag{3}$$

Where λ_i estimated characteristic and T is the number of usable observations. The λ_{trace} test the null hypothesis $r = 0$ against the alternative of $r > 0$ and λ_{max} test the null hypothesis is $r = 0$ against the alternative of $r = 1$.

The study also estimates the short-run and long-run causality between variables and equations is as follows.

$$Y_t = \beta_1 + \sum_{j=1}^{p} \beta_{1j} Y_{t-j} + \sum_{j=1}^{p} \beta_{2j} X_{t-j} + \sum_{j=1}^{p} \beta_{3j} M_{t-j} + \lambda_4 ECM_{t-1} + \varepsilon_{1t} \qquad (4)$$

$$EX_t = \delta_1 + \sum_{j=1}^{q} \delta_{1j} Y_{t-j} + \sum_{j=1}^{q} \delta_{2j} EX_{t-j} + \sum_{j=1}^{q} \delta_{3j} IM_{t-j} + \lambda_4 ECM_{t-1} + \varepsilon_{2t} \qquad (5)$$

$$IM_t = \gamma_1 + \sum_{j=1}^{r} \gamma_{1j} Y_{t-j} + \sum_{j=1}^{r} \gamma_{2j} EX_{t-j} + \sum_{j=1}^{r} \gamma_{3j} IM_{t-j} +$$

$$+ \lambda_4 ECM_{t-1} + \varepsilon_{3t} \qquad (6)$$

Where Y_t is the natural logarithm of economic growth at time t; EX_t is the natural logarithm of exports at time t; IM_t is the natural logarithm of imports at time t; β, δ and γ are short-term coefficients and p, q and r are the log orders, $\varepsilon_{it} (i = 1,2,3)$ are serially uncorrelated error terms, ECM_{t-1} is the lagged error correction term, λ's are the speed of adjustment parameters.

4. Results and discussions

4.1. Stationarity

To know the stationarity properties, the study uses ADF test for economic growth, exports and imports and results are displayed in Table 1.

Table 1. *ADF test results*

Variables	At level		First difference	
	t-Statistic	Prob.	t-Statistic	Prob.
Y	8.172	1.000	-1.845	0.062***
EX	2.200	0.992	-2.926	0.004*
IM	2.146	0.991	-4.848	0.000*

Note: * and *** indicates significance at 1% and 10% level.

The study could not find stationarity at level. Therefore, the study converted economic growth, exports and imports variables into first order difference. Then, the study confirmed that economic growth, exports and imports variables are stationary at their first difference. Further, all variables are stationarity at first difference.

4.2. Long-run relationship

To find the long-run relationship among the economic growth, exports and imports, the study applies Johansen cointegration test. The cointegration results are reported in Table 2.

Table 2. Cointegration test results

Model: lnY = f (EX, IM)				
Hypothesized: No. of CE(s)	trace test	critical values	λ-max test	critical values
None	32.931	29.797*	20.268	21.131*
At most 1	12.66	15.494	12.438	14.264*
At most 2	0.224	3.841	0.224	3.841

Note: * indicates cointegration at 1% level.

The study results confirmed that there is a long-run equilibrium relationship among the economic growth, exports and imports. It implies that economic growth, exports and imports variables are moving together in the long-run.

4.3. Direction of causality

To identify the direction of causality between the economic growth, exports and imports. The applies Granger causality test and to estimate this method variables to be first difference. Therefore, author converted into first order and results are reported in Table 3.

Table 3. *Multivariate Granger causality results*

	F-Statistics for Short run causality			t-statistics for long run
Dependent Variable	Y	EX	IM	ECT_{t-1}
Y	-	4.494 [0.016]**	0.795 [0.457]	-1.708(0.090)***
EX	2.859 [0.068]*	-	5.608 [0.000]***	-1.674(0.096)***
IM	3.126 [0.054]*	0.993 [0.378]	-	-1.450(0.149)

Note: *, ** and *** indicates significance at 1%, 5% and 10% level, respectively.

The above results are confirmed that there is a unidirectional causality from economic growth to exports; exports to economic growth; exports to imports; imports to economic growth in the short-run. In the long-run, author confirmed that there is a bidirectional causality relationship between economic growth and exports; and exports and imports. The results are support the growth led growth hypothesis, exports led growth and imports led growth hypothesis under study.

5. Conclusions

The present study examines the relationship among economic growth, exports and imports during the period of 1970-2019. In general, both exports and imports are increases economic growth. Given this background, the study analyzed. The results are confirmed that there is a long-run equilibrium relationship among economic growth, exports and imports. The direction of causality, author reported that there is a unidirectional causality from economic growth to exports; exports to economic growth; exports to imports; imports to economic growth in the short-run. In the long-run, author confirmed that there is a bidirectional causality relationship between economic growth and exports; and exports and imports. Finally, the study results indicate that both exports and imports increase economic growth in India.

References

Al-Khulaifi, A.S., 2013. Exports and imports in Qatar: Evidence from cointegration and error correction model. *Asian Economic and Financial Review*, *3*(9), p. 1122.

Awokuse, T.O., 2007. Causality between exports, imports, and economic growth: Evidence from transition economies. *Economics Letters*, *94*(3), pp. 389-395.

Awokuse, T.O., 2008. Trade openness and economic growth: is growth export-led or import-led? *Applied Economics*, *40*(2), pp. 161-173.

Baharumshah, A.Z. and Rashid, S., 1999. Exports, imports and economic growth in Malaysia: Empirical evidence based on multivariate time series. *Asian Economic Journal*, *13*(4), pp. 389-406.

Bakari, S. and Krit, M., 2017. The nexus between exports, imports and economic growth: Evidence from Mauritania. *International Journal of Economics and Empirical Research*, *5*(1), pp. 10-17.

Bakari, S. and Mabrouki, M., 2016. The Relationship among Exports, Imports and Economic Growth in Turkey.

Çetintaş, H. and Barişik, S., 2009. Export, import and economic growth: The case of transition economies. *Transition Studies Review*, *15*(4), pp. 636-649.

Ee, C.Y., 2016. Export-led growth hypothesis: empirical evidence from selected Sub-Saharan African countries. *Procedia Economics and Finance*, *35*(2), pp. 232-240.

Erfani, G.R., 1999. Exports and economic growth in developing countries. *International advances in economic research*, *5*(1), pp. 147-148.

Gokmenoglu, K.K., Sehnaz, Z. and Taspinar, N., 2015. The export-led growth: A case study of Costa Rica. *Procedia Economics and Finance*, *25*(1), pp. 471-477.

Hamdan, B.S., 2016. The effect of exports and imports on economic growth in the Arab countries: A panel data approach. *Journal of Economics Bibliography*, *3*(1), pp. 100-107.

Hassan, K.G., 2020. Empirical investigation on the relationship between exports and economic growth in selected LDCs country groups (1988-2018). *Economic Journal of Emerging Markets*, *12*(1), pp. 1-12.

Hatemi-j, A., 2002. Export performance and economic growth nexus in Japan: a bootstrap approach. *Japan and the World Economy*, *14*(1), pp. 25-33.

Hye, Q.M.A., 2012. Exports, imports and economic growth in China: an ARDL analysis. *Journal of Chinese Economic and Foreign Trade Studies*.

Kibria, M.G. and Hossain, M.S., 2020. Does export affect the Economic growth?: An empirical investigation for Bangladesh. *American Journal of Economics and Business Management*, *3*(1), pp. 219-226.

Kilavuz, E and Topcu, B.A., 2012. Export and economic growth in the case of the manufacturing industry: panel data analysis of developing countries. *International Journal of Economics and Financial Issues*, *2*(2), pp. 201-215.

Raghuramapatruni, R. and Surya Chaitanya, R.V., 2020. An appraisal of the impact of international trade on economic growth of India-through the ARDL approach.

Shan, J. and Sun, F., 1999. Export-led growth and the US economy: some further testing. *Applied Economics Letters*, *6*(3), pp. 169-172.

Sultan, Z.A. and Haque, M.I., 2011. The estimation of the cointegration relationship between growth, domestic investment and exports: the Indian economy. *International Journal of Economics and Finance*, *3*(4), pp. 226-232.

Sultan, Z.A. and Haque, M.I., 2011. The estimation of the cointegration relationship between growth, domestic investment and exports: the Indian economy. *International Journal of Economics and Finance*, *3*(4), pp. 226-232.

Tang, T.C., 2006. New evidence on export expansion, economic growth and causality in China. *Applied Economics Letters*, *13*(12), pp. 801-803.

Vohra, R., 2001. Export and economic growth: Further time series evidence from less-developed countries. *International Advances in Economic Research*, *7*(3), pp. 345-350.

Zang, W. and Baimbridge, M., 2012. Exports, imports and economic growth in South Korea and Japan: a tale of two economies. *Applied Economics*, *44*(3), pp. 361-372.