

An Empirical Study of Nexus between Export Performance and Economic Growth

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Abstract

The relationship that exists between export and economic growth has always been a controversial issue. This paper investigates empirically how does the increasing exports affect the economic growth in India and whether the growth of India is a function of exports or not. The result of the paper via regression analysis highlights the fact that the increasing export has definitely its positive influence on the growth of Indian economy but in addition to it, there are several factors that contribute to the growth & development of the country. This paper also investigates the causal relation between export and GDP from 1961-2016 by using the data from WDI indices 2019. Time series data has been used to see whether the increasing real exports and real GDP are co integrated or not. The empirical results show the presence of cointegration relationship existing between exports and GDP. The long run relationship is also justified by VEC Model. The Granger Causality results show the bidirectional causality between export growth and economic growth in the long run. It means bi directional hypothesis is supported which suggests that growth of exports is bringing growth of GDP and growth of GDP helps in growth of exports so both are complementary. So, policy makers should take steps to enhance GDP which itself will help in growing the exports from India. The findings of the study will also help understanding why there is need for export promotion which will help in achieving sustainable growth in the long run.

Introduction

Every economy aims to achieve economic growth (Marwan et al., 2013). This economic growth for any economy is a complex phenomenon which involve the influence of many factors like increase in trade (export import), capital formation and its accumulation (human and physical capital), price fluctuations, how income is distributed and most importantly by the geographical conditions of the country. It is a sturdy fact that growth and welfare of any economy can not only be attributed to just an increase in the number of laborers and an accumulation of capital infact it involve a complex the process of the diverting the entire resource using pattern from a less productive sector to a more efficient and productive export sector. So, increasing export is no doubt an important determinant of growth of an economy; and it is considered as an engine through which the economic growth runs. (Hader, 1982; CNUCED, 2001; Emilio, 2001; Clare et al., 2002; Gabrielle, 2004; Herrerias and Orts, 2010; Javed & Waheed, 2011; Marwan et al., 2013; Wong, 2010; Hye, 2012; Szkorupova, 2014; Were, 2015; Sokolov et al., 2016; Yao, 2018). The hypothesis that specify export activities result in growth of an economy is simply termed as Export- led growth hypothesis (Konya, 2006).

An immense interest in export promotion as an agent of growth is credited to its ability to generate specialization in production which results in productivity gains. Exports also help a country to have more efficient resource allocation via switching to the factors of production towards the sector which is more productive - resulting in increase in the productive capacity and reaping the benefits of economies of large scale (Krueger, 1980; Michaely, 1977). The expansion of exports act as an incentive of foreign exchange earnings, it enables an economy to meet its developmental needs via inducing more import of new updated technology and source of new raw material while any decrease in exports represent a setback in trade's growth resulting in low level of growth of economy (Wu. et al., 2004; Konya, 2006; Jun, 2007; Chanda & Sahoo, 2007). An increase in exports acts as tool which brings multiplier effect working from growth of exports to growth of an economy for instance the growing demand for export of goods & services itself result in increasing demand for factors of production (derived demand) which raises the income level of economy. The increasing demand of goods and services as the result of an increase in income of the factors of production (because of growing exports) definitely spread to the rest of the sectors also. This result in the pressure on domestic capacity from the local market and the rest of the world which can induce a country to bring change in its technology and to open its gates for new investment opportunities in different fields. Thus it acts as a channel of capital formation which stimulates growth (Quddus et al., 2005).

Moreover, the increasing exports generate greater capacity utilization; beget more employment, improve the per capita output of labor; enhance the resource allocation of scarce means in the economy by bringing about technological progress (Abou-Stait, 2005). In the economies increasing exports enhance the TFP, brings improvement in the well-being of the country as it attracts the foreign direct investment and apart from it increases the native country's external earnings which reduce the balance of payment pressure (World Bank, 1993; Herrerias & Orts, 2010). Furthermore, induced by the returns from foreign markets, exporters try to bring innovation and improved production technology and are apt to face the global competition that make them more efficient (Dritsaki and Stiakakis, 2014). Recently it has been found learning opportunities come from exporting effect which energizes the economic growth and result in high productivity in an economy (Grossman and Helpman, 1991; Clerides et al., 1998; Lee, 2011; Julian et al., 2012; Dai and Yu, 2013; Foster-McGregor, 2014; Lin, 2015; Hu and Tan, 2016)

The success stories of developed nations like Canada, U.S.A, Hong Kong, England etc have empirically confirmed the fact that export expansion had always been the key factor of enhancing the economic growth of these economies. Over the last few decades, enough evidences have come from developing countries which prove the fact that exports

are the driving force for stimulating the economic growth (Shahbaz, et al., 2011), for instance the rapid growth of Mexico has been credited to its growing exports (Emilio, 2001; Tang, 2006; Sahoo, 2014). Today, the best example of exports promoting growth can be manifested from Asian Miracle economies i.e. China, India, Japan, Korea, Singapore and Taiwan (James et al., 2015; Tang, 2015).

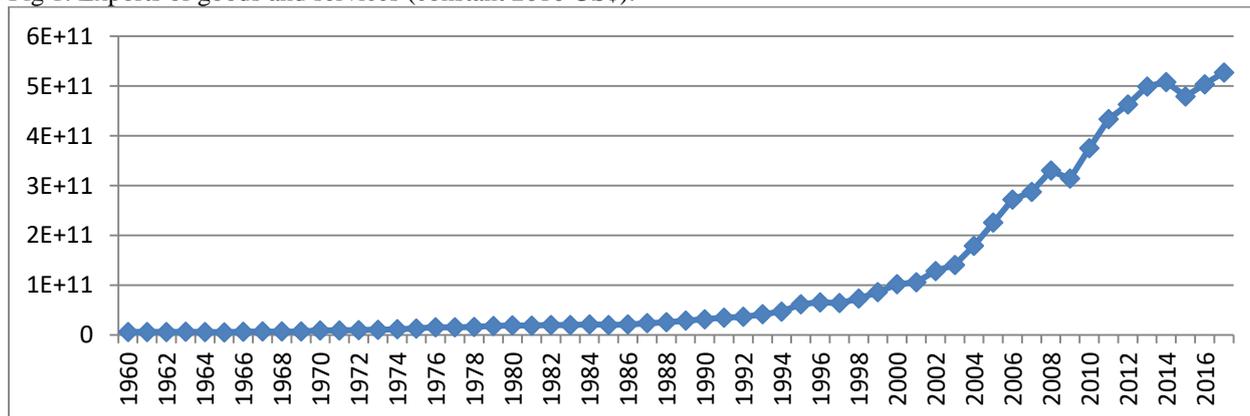
Developing countries mainly want growth to be achieved, the expanding exports is a ray of hope and the principle factor to achieve the same and a number of ways are available through which exports can augment growth and development both directly as well as indirectly. The indirect contribution involve – local producers who supply goods to limited markets get chance to gain efficiency via economies of scale reaped by them from expanding exports market. Apart from it, in reciprocal there is an increased import as exports open ways to them. The increasing instance of competition at an international level will create more urgency of bringing up the structured ways and means in production inducing factors of the home country as well. In addition to it, the increasing international trade which will act as a means of transferring the technological know- how through the interactions with the international businesses taking place (Chenery and Strout, 1966; Balassa, 1978; Grossman and Helpman, 1991; Aw, 1998; De Loecker, 2007; Balcilar and Ozdemir, 2013; Lin, 2015). So with the increasing exports there increases the positive spillover effect and externalities which contribute to overall growth of both high income countries as well as low income countries and increasing export revenues has become a way of achieving higher economic growth (Parikh and Stirbu, 2004; Girma et al. 2004; Mamun and Nath, 2005; Abou-Stait, 2005; Tang, 2006; Couto et al., 2006). This accumulating export earning is the best reason behind the robust growth of Asian tigers like Taiwan, Hong Kong, Singapore, Malaysia and South Korea . The best recent example of growth from increasing exports is of China and there are evidences of the fact even at the micro level with degree of export participation, the country has reaped improvement in TFP at the grass root level (Bahmani-Oskooee, 1993; Giles and Williams, 2000; Van Biesebroeck, 2005; Mamun and Nath, 2005; Maneschiold, 2008; Haidar, 2012; Julian et al., 2012; Tingvall and Ljungwall, 2012; Belloumi, 2014; Tang et al., 2015; Ang et al., 2015; Shafiullah et al., 2017; Hu and Tan, 2016; Yao, 2014; Yao et al., 2018). In nutshell, exports are considered to be aiding the economic growth via the spillover of technologies, transfer of technical knowhow and economies of scale (Grossman and Helpman, 1991; Lee, 2011) but Foster (2007) highlights the fact although countries like Africa has reaped the positive benefits of higher economic growth but after reaching a certain level of development this state of affair doesn't continue for longer period (Pistoresi and Rinaldi, 2012).

2. India's Export Scenario

India at present is the fastest- burgeoning trillion-dollar economy in the world and is the fifth the largest economy in terms of global ranking with a nominal GDP - **2.94 trillion US \$ and 10.51 trillion US\$** in terms of PPP (WEO, 2019). India by 2050 is expected to be the second largest economy in terms of ppp in the world (Hawksworth et al., 2017). For achieving such growth level, India needs to strengthen its exports capacity by properly exploiting economies of scale which can be gifted by gaining access of the large world markets (Agarwal, 2015).

Trends in the exports of India are shown in figure1. It can be observed that growth of exports from 1961-2017 have shown considerable growth over years. After independence, India adopted inward looking strategy (Import substitution) and export was confined to only goods with surplus production which resulted in slow growth of economy however with the adoption of new economic policy there was a U turn which changed the slow pace of growth and there was impressive growth.

Fig 1: Exports of goods and services (constant 2010 US\$).



Source: Authors own calculations from WDI 2019

Exports gained importance in 1960's and no serious efforts were made towards it, so it grew moderately. During this phase India's exports were confined to agricultural commodities like tea, jute, oils, cotton etc. with inelastic demand. Various steps were taken for the promotion of exports at this stage like Cash Assistance Scheme (CAS) which later was named as Cash Compensatory Support (CCS) , Duty Drawback Scheme (DDS) and opening of institute like Indian Institute of Packaging; Export-Import Bank of India etc. After the adoption of new economic reforms there was much impressive growth, talking about Indians merchandise exports growth which was 0.6% in 1991 increased to 1.7% per annum in 2018 (IES, 2019). Fig.1. show the exports from India have increase over years as at the time of Independence these were only 1269 million US\$ (1950-51) which has increased to 302840 million US\$ in 2017-18 (GOI, 2018).

Recent trend in exports are further shown in table 1. Which clearly show the increase in exports which was 36.3 billion US\$ to 299.3 billion US\$.

Table 1: Exports (billion US \$)

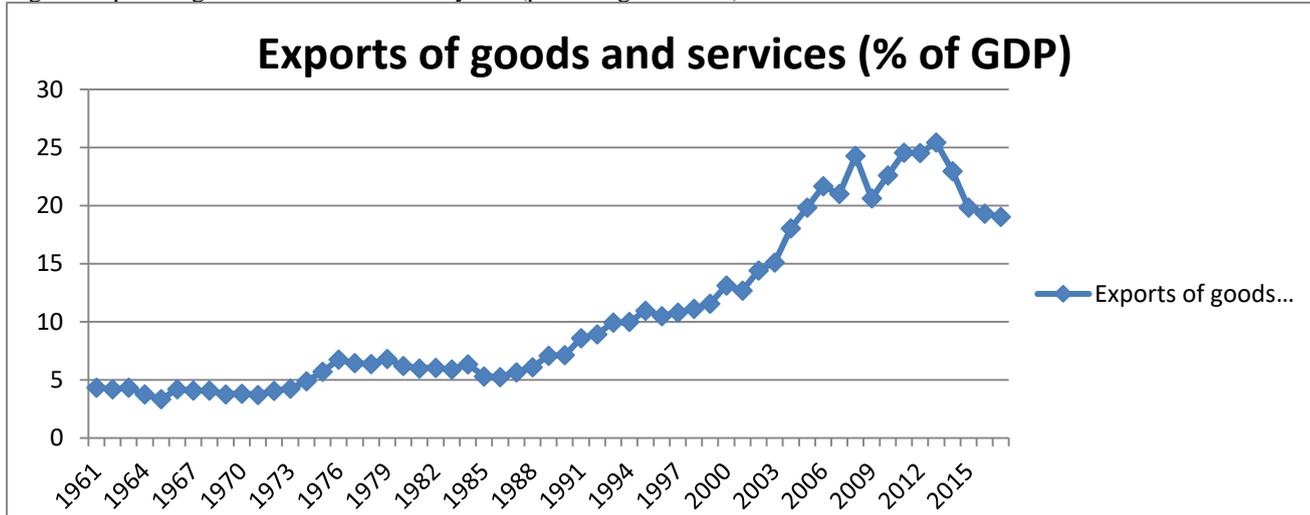
Country	1999	2000	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2017
<u>India</u>	36.3	43.1	44.5	44.5	57.24	69.18	76.23	112	176.4	168.2	201	299.4	298.4	313.2	299.3

Source: Export Import data, CIA world fact book

Exports of goods and services over years as percentage of GDP

The contribution of exports of goods and services has been increasing especially since late 1980's Fig.2. further throws light on growing exports contribution in GDP of India

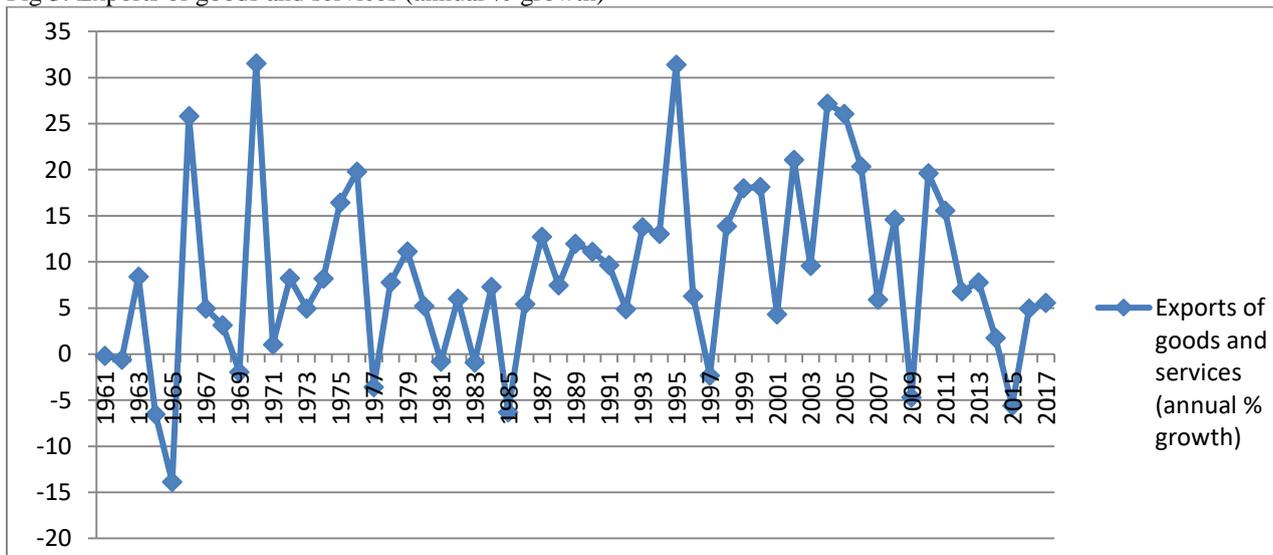
Fig 2: Export of goods and services over years (percentage of GDP)



Source: Authors own calculations from WDI 2019

From figure 2 it is clear that the exports as percentage of GDP have been increasing with time. After Independence of India, exports were mainly stagnant up to 1960's as the exports were confined to agricultural commodities like tea, jute cotton etc. with inelastic demand. During 1960 various steps were taken for the increasing making an upsurge to exports like setting up Export Inspection Council, IIFT, export promotion zones, The Spices Trading Cooperation Indian Institute of Packaging, trade fair authority of India, Export Promotion Council, India Trade Promotion Organization, Export Houses, EXIM bank etc. Especially the adoption of globalization has acted as a lubricant to the growth of Indian exports as the result of all these efforts from 1972 to 2004 there was 20% increase in country's export. In 2004 -05 there was a remarkable increase in exports i.e. 30.8% increase in exports. In 2010-11, Indian exports grew by 37.5% which was the fastest annual growth achieved so far.

Fig 3: Exports of goods and services (annual % growth)



Source: Authors own calculations from WDI 2019

Fig. 3 clearly shows that the growth of exports over years has continuously facing ups and downs. Recently various schemes have been launched by GOI for the expansion of exports like Export Oriented Unit (EOU) Scheme, Services Exports from India Scheme (SEIS), market Development Assistance Scheme, Market Access Initiative (MAI) Scheme, Export Promotional Capital Goods (EPCG) Scheme etc for the promotion of exports.

Govt. has taken many schemes for increasing share of exports in like launching of Make in India campaign to further enhance the exports from India.

The increase in exports has been faster after 1990's, but the growth rate has been decreasing over last few years.

The studies mentioned in the existing literature have failed to generalize the particular view in regard to the existence of direction of causality amongst renewable energy and per capita economic growth. Some studies at an international level, mostly developed country cases have been made to visualize the nexus between renewable energy usage and economic growth; however, there is dearth of literature analyzing long run and short run renewable energy and the economic growth relationship in rapidly developing country like India. Present study will serve the purpose by contributing to existing literature via identifying the impacts of renewable energy on per capita GDP of India and will provide valuable insights to the policy-makers in future. The study shall address the dynamics of relationship amongst renewable energy use and economic growth in the long run as well as short run. The short run as well as long run analysis allows in generalizing the potential impact of energy transition from non-renewable forms of energy to renewables through cointegration and granger causality analysis. The long run analysis enables in forecasting the impact of increasing renewable energy share (*if undertaken*) on the economic growth in future.

The particular aims of the study include

1. To evaluate the trends in the exports and economic growth of India since 1961 till 2017.
2. To estimate the long run cointegration and Granger causality direction between exports and economic growth in India.

4 Review of literature

The relation between exports and its impact on economic growth has always been a subject of significant interest since 1960's (Konya, 2006). There is plethora of empirical work that has examined the part played by exports in promoting economic growth (Tang, 2015). Large theoretical and works in the literature is present, which try to prove that the increasing exports is one of the basic ingredient or determinant of economic growth of a country or region (Kravis, 1970; Michaely 1977; Krueger, 1980; Bahmani-Oskooee, 1993; Salvatore and Hatcher, 1991; Giles and Williams, 2000; Clare et al., 2002; Gabrielle, 2004; Giles and Williams, 2000; Parikh and Stirbu, 2004; Van Biesebroeck, 2005; Cuaresma and Worz 2005; Iqbal et al., 2011; Dritsaki, 2013; Tang et al. 2015; Raither, 2017). However there is no unanimity on the part of actual direction of causality that exist between the increasing export and economic growth (Jun, 2007).

Growth hypothesis: This hypothesis implies a uni-directional relationship existing between exports and the growth of an economy. This hypothesis considers exports as important determining factor of growth of a country. Jung and Marshall (1985) supported this and found in four countries causality streaming from exports to growth in some countries. Kónya 2006 also found same to be true in case of Ireland, Denmark, Belgium, and Iceland, where increasing exports had resulted in growth of their economies. Other studies like Dodaro (1993); Bahmani-Oskooee et al. (2005); Konya,2006; Reppas & Christopoulos (2005) also establish similar results of unidirectional causal relationship to be true in a small chunk of countries as growing exports were empirically proved to be notable agent of growth in these countries.

Gokmenoglua et al. (2015) supported reverse of growth hypothesis as they found the uni- directional causal relation existing towards export from the increase in growth of economy which implies that with the rise in growth of an economy there is an increase in exports of a country. This hypothesis supports that with the advancement in growth of a country there will be an increase in exports. Konya (2006) empirically proved the unidirectional causal relationship running from rise in GDP of Costa Rica to the rise in exports of it.

Kwan and Cosomitis (1990) found two way causal relation existing between the rise in exports and growth of China from 1952 to 85. Oskooee et al. (1993) after applying causality test on quarterly data found a strong empirical support for bi-directional causality existing between growth of export and growth of GDP. Other studies that support the bi directional causality are Chow's (1987), Ghatak et al., (1997), Bahmani-Oskooee, (1993), Dodaro, S. (1993), Doraisami, (1996) Sharma & Dhakal (1994); Ramos, (2001) Wernerheim, (2000), Mah, (2005) Dritsaki et al., (2004), Bahmani et al. (2005); Awokuse, (2007), Wernerheim, (2000), Dritsaki et al. (2004), Konya, (2007), Fowowe, (2011).

Apart from support in unilateral or bilateral causality some studies found no relation existing between growing exports and the growth of economy. Darrat, (1986) found no causal relation between export and growth of the Little Dragons i.e. Hong kong, Singapore and south Korea, it implies causality tends to be neutral in these countries. Konya, (2006) came with the view point that in some countries like the UK, Australia, Luxembourg, Switzerland, Korea, and the United States of America there is no sign of causality in each of the directions. Marwan,et al., 2013 also found no causality between the growing export and economic growth in Sudan.

Table1: Regression Analysis of GDP and Exports

Regression Statistics				
R Square	0.1994			
Adjusted R Square	0.1849			
	Coefficients	SE	T Stat	P-value
Intercept	3.279379	.6747684	4.86	0.000
Export	.1961897	.0530007	3.70	0.000

Source: Authors own calculation

Thus the regression line from regression analysis is as under. These estimates have been derived from simple regression analysis for the study periods between 1961-2017

$$GDP=3.279379 (C)+1961897 (EX)------(1)$$

In the equation 1, GDP is the dependent variable which is dependent and Export is independent variable. However, C is the intercept/ constant or the autonomous variable in the above variable. With 1 percent change in Exports will

bring 0.1961897 percent increase in GDP. This regression proves that in long run exports bring positive role on growth of GDP in India. Table 1 also shows that the coefficient is low, this can be attributed to the fact that in comparison to exports of countries like China, USA, Asian Tigers etc the exports from India are very low and there is need of bringing competitiveness in this sector so that this sector may further help in growth of GDP.

Empirical Results and Discussions

To analyze empirically the relationship between exports and economic growth, cointegration and causality approach has been undertaken for the present study. First step in this direction involves checking the unit root properties of the data, due to the property of non-stationary associated with time series data. In order to remove the unit root problem, Augmented Dickey Fuller test has been used (Dickey and Fuller, 1979). The null hypothesis suggested presence of unit root in data.

The stationarity results of the variables is given in Table 2. From the table it can be stated clearly from the stationarity analysis that the null hypothesis of non-stationarity can be rejected at a level but cannot be rejected at first-order difference for both the variables. Thus, the test result shows that the variables are integrated of order 1. Table 2 will further help in showing

Table 2: Results of unit root test

Variables	Augmented Dickey-Fuller Test	
	Level	First Difference
GDP	-6.5527 (0.0000)	—
EXP	-0.3787 (0.9053)	-7.5492 (0.0000)

Source: Authors' estimation

Note: Values in parentheses are p-value.

Table 3. Johansen Cointegration Test Results of Trace Statistic

Hypothesized No. of CE(s)	Unrestricted Cointegration Rank Test (Trace)			
	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.474104	35.54883	15.49471	0.0000
At most 1	0.003683	0.202946	3.841465	0.6523

Source: Authors' estimation.

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

Hypothesized No. of CE(s)	Unrestricted Cointegration Rank Test (Maximum Eigenvalue)			
	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.474104	35.54883	12.26460	0.0000
At most 1	0.003683	0.202946	3.841465	0.6523

Source: Authors' estimation

(1) Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level.

Notes: (2) * denotes rejection of the hypothesis at the 0.05 level.

Table 5. Estimates of Vector Error Correction Model

Variable	Coefficient	Std. Error	t-statistic	Prob.
ECT	-1.366059	0.202452	-6.747567	0.0000
D(GDP(-1))	0.249615	0.139057	1.795061	0.0786
D(EXP(-1))	0.366060	0.320410	1.142474	0.2586
Constant	-0.046811	0.379551	-0.123333	0.9023

Source: Authors' estimation.

denote statistical significance at 5%.

Note: *

The study uses Johansen's cointegration test for the purpose of checking the long-run relationship existing between the two study variables as the variables are found to be stationary after the first order differentiation and the test results are given in Table 4 & 5. The results of the test obtained from the Johansen cointegration test clearly depicts that the null hypothesis of $r = 0$ or having no cointegration is rejected at the 5 percent critical value both by the Trace statistic value as well as

the maximum eigenvalue tests. So, the variables are found to be showing one cointegration equation among them. In other words, there exists a long-run equilibrium relationship between exports and economic growth in India, which provides us with the implication that exports is significant for the economic growth of India. This is in line to the works of Bahmani-Oskooee et al. (2005); Konya, 2006; Reppas & Christopoulos (2005); Mamun and Nath, (2005); Maneschiold (2008); Lee, (2011); Haidar (2012).

Table 6. Granger Causality Test Based on VEC Model

Dependent Variables	Chi-square statistics	
	GDP	EXP
GDP	—	4.8009 (0.0907)
EXP	17.7774 (0.0001)	—

Source: Authors' estimation.

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

Notes:

(2) *, **, and ***

The present study uses VECM the for examining the dynamics causality linkages between the exports and economic growth of India in both long run and short run. The ECT in VECM clearly shows how the disequilibrium is restored toward equilibrium in the long run. The results in Table 5 show that the disequilibrium in the long run is restored because the ECT in the model is negative and significant with the value -1.366059.

In the end, the results of the study are undertaken to estimate the short-run causality existing among the exports and economic growth via the use of the Wald test, and the results are given in Table 6. The null hypothesis of no causality from exports to GDP is rejected at the 5 percent level of significance, also the null hypothesis of no causality from GDP to Exports is also rejected at 10 percent significance level. The result shows causality running from both exports to GDP growth and from GDP growth to growth of exports. This proves bidirectional causality existing between growth of export and growth of GDP in India, it means that there is need for policy makers to come forward to bring improvement in both GDP and exports as an improvement in exports will bring improvement in GPD and also increase in GDP will result in improvement in exports.

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