

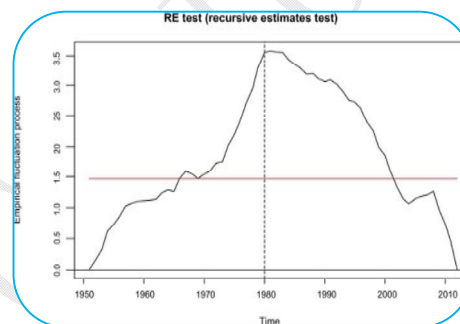


THE NEXUS BETWEEN EXPORT AND ECONOMIC GROWTH IN INDIA: AN EMPIRICAL INVESTIGATION IN THE POST-REFORM ERA

Nirmali Borkakoty

ABSTRACT:

Exports have received an important place in the developmental efforts of most of the countries as a part of their steps towards market-driven economy in past few decades. The potential impact of export-led strategy in the growth process of an economy has been recognised by the development economist long back. This study examines the export-growth relationship in case of India over the post-reform period with the help of Cointegration analysis (Johansen Cointegration Test) and Vector Auto-Regression (VAR) model. The results reveal that although there is no long-term cointegration between exports and Gross Domestic Product (GDP), uni-directional causality from exports to GDP exists in case of India during the study period. In view of the strong impact of exports on GDP growth, this study suggests that Govt. of India should boost up its export promotion measures in order to achieve rapid growth in a period when the Indian economy is moving through a phase of radical liberalisation.



KEYWORDS: Export, GDP, Economic Growth, Export-Led Growth, Cointegration, Vector Auto-Regression.

1. INTRODUCTION :

Exports have received an important place in the developmental efforts of most of the countries as a part of their steps towards market-driven economy in past few decades. Expansion of exports may lead to larger output and employment. It allows fuller utilisation of capacity, increased exploitation of economies of scale and separation of production pattern from domestic demand. At micro level, exports make provision

for important outlets for a number of industries. Development economists have long recognized the potential impact of export-led strategy in the growth process of national income. The Export-Led Growth Hypothesis (ELGH) postulates that export expansion is one of the key determinants of economic growth. Ramos (2001) suggests that the hypothesis of export-led growth (ELG) is substantiated by the following four arguments: first, export growth leads to an expansion of production and employment by the foreign trade multiplier.

Second, the foreign exchange made available by export growth allows the importation of capital goods, which, in turn, increase the production potential of an economy. Third, the volume of and the competition in export markets cause economies of scale and an acceleration of technical progress in production. Fourth, given the three arguments mentioned above, the observed strong correlation of export and production growth is interpreted as empirical evidence in favour of the ELGH. A number of studies have been

conducted to examine the export -growth relationship in an attempt to provide policy recommendations geared towards enhancing growth of exports and subsequently economic growth of countries. However, the export-growth nexus has exhibited mixed results in case of different countries. The results for time series data covering 1950-1981 for 37 LDC's obtained by Jung and Marshall (1985) did not support the export led economic growth in 33 countries except in Egypt, Costa Rica, Indonesia and Ecuador. Ukpolo (1994) did a study of 8 African LDC's over the period 1969-1988 using time series data for each of the countries. The findings showed a unidirectional causality running from non-manufactured exports to output. Ismail and Harjito (2003) empirically tested the relationship between export and economic growth in the case of ASEAN countries over the period 1966-2000 using a co-integration and causality framework. They found that exports and economic growth are integrated in Indonesia and Singapore while, in other countries there exists a short run relationship between exports and economic growth. Secondly, a two-way causality relationship between exports and economic growth was found in Indonesia and the Philippines and a unidirectional causality running from exports to economic growth was found in case of Singapore. Shirazi (2004) also found the existence of a unidirectional relationship that runs from exports to output in case of Pakistan during the period 1960-2003. Medina-Smith (2000) tested the ELGH in case of Costa Rica for the period 1950-1997. The study found that the ELGH is valid in case of the country; however, the empirical results also showed that physical investment and population mainly drove Costa Rica's overall economic performance from 1950 onwards.

The foreign trade policy regime of the developing countries was governed by import substitution policies until the mid-1970s. But in late 1980s developing countries had to make a decision to go either for export promotion measures or import substitution policies where many developing countries opted for export promotion measures ahead of import substitution (Sharma and Dhiman, 2014). It was hoped that expansion of exports would lead to better resource allocation, creation of economies of scale and production efficiency through technological development, capital formation and employment generation (Shirazi and Manap, 2005). India's export policy in the pre-reform period has been classified by Bimal Jalan, the former Governor of Reserve Bank of India, into three phases. The first phase covered up to the first oil shock of 1973, was mostly characterised by export pessimism with a stagnant demand for exports. The second phase covered the period starting from 1973 and continued for a decade. In this phase, exports were accorded high priority and the policies were followed accordingly. The third phase covered roughly the latter half of the Sixth Plan and the whole of the Seventh Plan. During this period, export promotion experienced a more positive approach and the Government of India enhanced incentives for export production and exports were incorporated as an integral part of industrial and development policies. With the onset of liberalisation in 1991, the importance of globalisation through trade and taking exports as engine of growth of the economy has been broadly recognised in the country. The Government of India has undertaken various export promotion schemes to boost up export sales growth and has established various institutions to assist the export trade sector. These organizations do not directly involve in trade activity but they provide organizational support to the exporters and help them to promote their export business. Presently, when the country is close to complete three decades of the initiation of economic reforms and it is moving through radical policy changes in order to become a more liberalised economy, it will be interesting to understand whether India's exports have any effect on the country's economic growth as per the expectation. In this context, this study attempts to examine the relationship between export growth and economic growth in India in the post-reform era.

The rest of the paper has been designed as follows: Section 2 outlines the objective of the study. In section 3 the methodology of the study has been specified. Section 4 gives an overview of the trends in the growth of India's exports; section 5 includes the results of the empirical analysis and its discussions and finally the section 6 concludes the study.

2. OBJECTIVE

The objective of this study is to examine the relationship between export and economic growth in India over the post-reform era and to test the validity of Export-Led Growth hypothesis in the economy during this period.

3. DATA SOURCES AND METHODOLOGY

The required data for the purpose of this study were sought from published reports of Ministry of Statistics and Programme Implementation (MoSPI) and Handbook of Statistics on Indian Economy, RBI, for the period elapsed between 1991-92 and 2017-18. Data which are collected for this analysis are: the values of Exports from India (in Crores) and the values of Gross Domestic Product (GDP) in Crores. In this study, export and GDP are converted into real terms for analytical purpose. Real export and real GDP are the indicators for export growth and economic growth respectively.

The model used to investigate the relationship between export and economic growth in case of India can be formulated as:

$$\text{Growth} = f(X) \quad (1)$$

Where, growth represents economic growth of India measured by real GDP and X stands for value of real exports.

The equation can be specified as:

$$\text{RGDP}_t = \beta_0 + \beta_1 \text{RX}_t + U_t \quad (2)$$

Where, RGDP= Natural log of Real GDP

RX= natural log of Real Exports

β_0 is the intercept term of the model

β_1 is the slope coefficient for RX

U_t is the error term

t stands for current time period

In its non-linear form the model can be re-written as:

$$\ln \text{RGDP}_t = \beta_0 + \beta_1 \ln \text{RX}_t + U_t \quad (3)$$

The study was conducted by using Vector Auto-Regression (VAR) model with the appropriate techniques for the work of the analysis to test the null hypothesis and the alternative hypothesis which are:

H_0 : There is no relationship between real export and real GDP growth in India.

H_1 : There is a causal relationship exists between real export and India's real GDP growth.

The empirical model used to test the causality between export and economic growth by the technique of VAR can be specified as:

$$\ln \text{RGDP}_t = \alpha + \sum_{j=1}^k \beta_j \ln \text{RX}_{t-j} + \sum_{j=1}^k \gamma_j \ln \text{RGDP}_{t-j} + U_{1t} \quad (4)$$

$$\ln RX_t = \alpha_1 + \sum_{j=1}^k \theta_j \ln RGDP_{t-j} + \sum_{j=1}^k \lambda_j \ln RX_{t-j} + U_{2t} \quad (5)$$

This study approaches the issue of export-economic growth relationship in India through the following steps:

Step 1: Testing for Unit Root in $\ln RGDP$ and $\ln RX$ by applying Augmented Dickey-Fuller (ADF) test.

Step 2: Testing for Cointegration between $\ln RGDP$ and $\ln RX$ by applying Johansen's Test for cointegration.

Step 3: Application of VAR model and Granger Causality Test.

4. TREND IN THE GROWTH OF INDIA'S EXPORTS

The progress of Indian economy in terms of exporting goods has been remarkable since the mid 1990s. The exports from India are broadly classified into four categories, namely, primary products, manufactured products, petroleum products and other products. Table 2 presents the annual growth of exports under different heads from 1991-92 to 2017-18. In this study, trend in the growth of India's exports has been analysed with the help of Annual Growth Rate (AGR) expressed in percentage for smooth comparison.

Table 1: Trend in the growth of India's exports (1991-92 to 2017-18)
(In percent)

YEAR	AGR _p	AGR _m	AGR _{pp}	AGR _o	AGR _x
1991-92	-	-	-	-	-
1992-93	-6.26	6.77	14.83	-12.64	3.76
1993-94	26.91	18.65	-16.46	80.35	19.97
1994-95	6.08	22.50	4.80	9.96	18.4
1995-96	39.17	16.38	8.83	14.46	20.75
1996-97	10.72	3.65	6.19	0.62	5.27
1997-98	-4.33	7.85	-26.77	23.69	4.59
1998-99	-9.88	-2.84	-74.66	-2.33	-5.11
1999-00	-5.83	15.21	-56.49	32.90	10.85
2000-01	9.23	15.55	4706.43	125.58	21.01
2001-02	0.52	-2.81	13.34	-4.47	-1.65
2002-03	21.53	20.60	21.58	1.53	20.29
2003-04	13.73	20.49	38.50	57.70	21.1
2004-05	36.88	25.24	95.87	20.33	30.85
2005-06	20.84	19.48	66.53	10.97	23.41
2006-07	20.20	17.03	60.10	26.39	22.62
2007-08	39.96	21.27	52.21	26.39	28.87
2008-09	-8.04	19.59	-2.88	130.99	13.74
2009-10	4.19	-6.47	2.34	-3.04	-3.53
2010-11	24.43	37.17	47.13	109.50	40.49
2011-12	39.82	17.36	35.10	-1.27	21.83
2012-13	0.60	-0.92	7.59	-44.23	-1.82
2013-14	-16.86	2.31	4.79	139.99	4.67
2014-15	-5.44	5.29	-10.11	-22.26	-1.29
2015-16	-16.96	-7.62	-46.43	-3.86	-15.49
2016-17	8.52	6.30	3.94	-7.89	5.17
2017-18	16.49	7.80	18.45	6.78	9.98

Notes: AGR_p, AGR_m, AGR_{pp}, AGR_o, AGR_x denotes Annual Growth Rate of primary products, manufactured products, petroleum products, other products and total exports respectively. Growth rates are expressed in percentage.

Source: Author's calculation based on Handbook of statistics on Indian Economy, various issues, RBI;

Table 1 reveals the trend in growth of exports in India during the study period. India's total exports have increased from Rs. 44042 Crores in 1991-92 to Rs. 1955541 Crores in 2017-18. However, the increase in exports has not been uniform over the years. At the onset of economic reforms, there is some welcome evidence of dynamic export growth in India facilitated by a supportive domestic new industrial policy. However, after that it has been increased in real terms but the annual growth rate was reduced in subsequent years till 1994-95. In the year 1994-95 manufactured exports recorded 22.50 percent growth whereas export of primary products and petroleum products were lower than the previous period's growth. However, the export of manufactured products had registered lower growth in the year 1995-96 over 1994-95. On the other hand, export of primary products, petroleum products and other products had increased by 39.17 percent, 8.83 percent and 14.46 percent respectively in the same period. The overall exports were increased by 20.75 percent during 1995-96 over the previous period. The annual growth of India's exports declined gradually from the next period and exports had registered a negative growth in the year 1998-99. It again increased sharply in the year 1999-2000 due to favourable terms of trade for non-oil exporting countries. However, this trend again came to an end when in 2001-02, the growth rate of exports diminished by 1.65 per cent. The contraction in export growth could be attributed to a marked deceleration in world output and trade. Exports recorded a robust growth of 20.29 per cent during 2002-03. The growth of exports in the year 2009-10 was negative which was the minimum in the entire decade of 2000-10 and it may be due to the negative growth in both the exports of manufactured products as well as other products. Moreover, the economic slowdown experienced by the countries during this period was another important reason for decline in exports. It revived in the next year with the 40.49 percent growth and it was the maximum during the entire study period. In the present decade, exports of the country have registered negative growth during 2012-13, 2014-15 and 2015-16 respectively. The rate of decline in exports was the highest in 2015-16 i.e. a decrease of 15.49 percent over the previous period which was also the maximum rate of decline during the entire study period. However, it has started to increase gradually from the next period. It is revealed that there is greater volatility in the growth of primary products exports during the study period. Exports of manufactured products recorded impressive growth in many years during the study period. The export of petroleum products also maintained remarkable growth during the later part of the study period.

The shares of exports in GDP throughout the study period have been presented on the Table 2. It is observed that export to GDP ratio had been gradually increasing since 1991-92 to till 2013-14 however, in recent years the share of exports in GDP is declining. The recent fall in export share since 2013-14 can be attributed to some structural factors like low technological adaptability and absence of technology intensive foreign investment; fluctuations in oil prices resulting in lower amount of foreign exchange earnings and slowdown of demand in global markets and moderation in commodity prices.

Table 2: Export to GDP Ratio in India (1991-92 to 2017-18)

(In percent)

YEAR	Export to GDP Ratio	YEAR	Export to GDP Ratio	YEAR	Export to GDP Ratio
1991-92	7.18	2001-02	9.96	2011-12	17.47
1992-93	7.63	2002-03	11.28	2012-13	17.41
1993-94	8.53	2003-04	11.56	2013-14	18.19
1994-95	8.65	2004-05	12.63	2014-15	15.21
1995-96	9.51	2005-06	13.46	2015-16	12.46
1996-97	9.13	2006-07	14.46	2016-17	12.04
1997-98	8.99	2007-08	14.31	2017-18	11.44
1998-99	8.37	2008-09	15.85		
1999-00	8.59	2009-10	13.84		
2000-01	10.58	2010-11	15.77		

Source: Author's calculation based on Handbook of statistics on Indian Economy, various issues), RBI; MoSPI, GOI.

5. RESULTS OF THE EMPIRICAL ANALYSIS AND DISCUSSION

5.1 Stationarity analysis

The first step of the analysis on the relationship between export and economic growth in India was to check for stationarity of variables. For this purpose, a univariate analysis of the two time series i.e. real GDP (RGDP) and real exports (RX) was carried out by testing for the presence of a unit root with the help of the Augmented Dickey-Fuller (ADF) test. The results of the ADF tests are summarised in the Table 3.

Table 3: Stationarity analysis: Results of ADF tests

Results of ADF tests in level of lnRGDP and lnRX		
	lnRGDP	lnRX
Without trend	-0.859	-1.057
With trend	-2.752	-0.756
Result	Non-Stationary	Non-Stationary
Results of ADF tests at First Difference of lnRGDP and lnRX		
	$\Delta_1 \ln \text{RGDP}$	$\Delta_1 \ln \text{RX}$
Without trend	-5.396***	-3.664**
With trend	-5.341***	-3.774**
Result	Stationary I(1)	Stationary I(1)

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

Source: Author's estimation

It can be seen from the table 3 that RGDP and RX are two non-stationary time series in level as the null hypothesis of a unit root cannot be rejected. The results of the ADF tests at the first differences of lnRGDP ($\Delta_1 \ln \text{RGDP}$) and lnRX ($\Delta_1 \ln \text{RX}$) show that the two time series are stationary implying they are integrated of order one.

5.2 Co-integration analysis

Two time series are said to be co-integrated if they have a long-term or equilibrium relationship between them. Before proceeding for further analysis, RGDP and RX were tested for co-integration by using Johansen co-integration test. The optimal lag structure of the VAR was selected on the basis of Akaike's information criterion (AIC), Schwarz's Bayesian information criterion (SBIC) and Hannan and Quinn information criterion (HQIC). The results of the co-integration analysis are presented in the Table 4. It can be seen from the table that the calculated trace statistics and max-eigenvalues are smaller than their critical values; therefore, the null hypothesis cannot be rejected. Thus, the two series are not co-integrated. It can be concluded that real exports and real GDP do not have long-term equilibrium relationship over the study period.

Table 4: Johansen's test for cointegrating vectors

H_0 = There is no co-integration between lnRGDP and lnRX.		
H_1 = lnRGDP and lnRX are cointegrated.		
Hypothesised no. of Co-integrating relationships	Trace statistic	Max-Eigenvalue
$r = 0$	10.3912 (15.41)	9.3743 (14.07)
$r = 1$	1.0169 (3.76)	1.0169 (3.76)

Notes: r indicates the number of co-integrating relationships. Figures in parentheses indicate critical values of Trace and Max-Eigenvalue.

Source: Author's estimation

5.3 Application of VAR: Granger causality test

In the next step VAR- model was applied in order to determine the causality direction between exports (RX) and economic growth (RGDP). The causality can be of four types – firstly, no causal relationship between exports and economic growth; secondly, unidirectional causality from exports to economic growth; thirdly, unidirectional causality from economic growth to exports and, fourthly, a bi-directional causality. The results of the Granger causality test are presented in the Table 5. It can be seen from the Table 5 that unidirectional causality from RX to RGDP exists in case of India during the study period.

Table 5: Results of the Granger causality test

Observation=26, Lag=1			
Time period	Hypothesis	F-Statistic	Direction of causality
1991-92	RX does not Granger cause RGDP	9.304*** (0.002)	RX → RGDP
to 2017-18	RGDP does not Granger cause RX	0.4942 (0.483)	No Causation

Note: Figures in parentheses are the p-values; *** indicates significant at 1% level.

Source: Author's estimation

The estimated pair of regression equation can be fitted as:

$$\ln \text{RGDP}_t = -0.6782807 + 0.4274872 \ln \text{RX}_{t-1} + 0.5991125 \ln \text{RGDP}_{t-1} \quad (6)$$

$$\text{SE} = (0.5010723) \quad (0.1401485) \quad (0.1246623)$$

$$p = (0.176) \quad (0.002) \quad (0.000)$$

$$\ln \text{RX}_t = 0.2662203 - 0.0539101 \ln \text{RGDP}_{t-1} + 1.033729 \ln \text{RX}_{t-1} \quad (7)$$

$$\text{SE} = (0.863683) \quad (0.768247) \quad (0.863686)$$

$$P = (0.389) \quad (0.483) \quad (0.000)$$

The equation (6) reveals that lagged values of real exports (lnRX) has strong positive effect on real GDP growth. The growth of real GDP is also significantly influenced by its own previous year's value. The unidirectional causality running from real exports (RX) to real GDP and the statistically significant effect of real export on real GDP growth supports the validity of export-led growth hypothesis in case of India over the study period. The growth of real exports however, does not significantly influenced by lagged valued of real GDP (equation -7) and results of the Granger Causality test also revealed the neutral causality from real GDP to real exports.

6. CONCLUSION

This study investigated the relationship between export and economic growth in India over the period 1991-92 to 2017-18 using VAR model and Granger Causality test. The variables considered for this purpose were real exports and real GDP. The results showed that these two time series were non-stationary in level and stationary in the first difference. The Johansen's Cointegration test revealed that there was no long-term equilibrium relationship between real export and real GDP during the study period. However, a unidirectional causality running from export to GDP was found in case of India. The VAR results revealed a strong effect of the lagged values of real exports along with the lagged values of real GDP on economic growth (real GDP). Thus, the findings of this study support the validity of Export-led Growth in India during the study period.

The findings of this study have important policy implications. The strong positive effect of exports on economic growth implies that the policies should be designed to encourage export production and in view of recent decline in exports it is utmost necessary on the part of the Government to adapt corrective measures to boost up India's exports so as to avoid any deteriorating effect on economic growth of the economy.

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