

Trade Led Growth Hypothesis in India An Evidence



Economics

KEYWORDS : Vector Error Correction Model, Trade, Growth, Impulse Response Function, Variance decomposition.
JEL Classification: C22, C32, F10

Dr. Annapurna Dixit

Assistant Professor, Department of Economics, Arya Mahila PG College, Varanasi.

ABSTRACT

In the present study, an attempt has been made to examine the trade led growth theory in India. The effective way to explore connectivity in trade and economic growth would be the cointegration analysis between the variables. In the most of the studies on trade led growth the empirical work has been done by using Engel and Granger causality test and some others. For the purpose quarterly time series data from 1996 to 2012 has been taken for the variables gross domestic production at factor cost, export, import, trade balance and terms of trade of India. Data has been taken from various issues of Handbook of Statistics on Indian Economy and Press release on quarterly estimates of GDP of India from Central Statistical Organization. For detecting unite root we used two different test i.e. ADF and PP test. Cointegration test suggest for the model 5 (i.e. Quarterly Growth in GDP, export, import, trade balance and total trade) that there are four cointegrating vectors. The positive effect of trade liberalization results from positive effects of both import and export on economic growth.

Introduction

Economic growth of a country apart from internal resources depends on external resources. Specially in case of developing countries which are characterized by low capital formation, low savings which ultimately reveals shortage of resources needed for economic development and this resource gap can be fulfilled through foreign capital. Foreign capital, resources from various monetary/financial institution and surplus generated by international trade are possible sources of external resources which play vital role in the process of economic growth. In fact, in the initial phase of economic development, the underdeveloped countries need much larger imports in form of machinery, capital good, industrial raw materials etc. than they can possibly export.

As a result, the adverse balance of payment emerges as a prime feature of developing nations. This leads to a gap between the earning and expenditure of foreign exchange which can be filled up through foreign capital¹. Important sources of foreign capital are foreign aid, private foreign investment and resources from various monetary and financial institutions. Trade was considered to be not simply a device for attaining productive efficiencies it was also 'Engine of Growth'. For example, Adam Smith, a supporter of free trade had launched his frontal attack on the mercantilist regulation of international trade. Stressing that international trade increase the well-being of all the trading nations and that any restriction on it will be harmful². Benefits from international trade were put forward explicitly by David Ricardo in his comparative cost theory which is the backbone of the classical theory of the international trade³.

In absence of trade, the import of capital goods, so essential to a nation's growth, would be impossible. Trade also acquaints people with new and attractive goods that acts as incentive to greater effort. In all these ways, trade acts as "Engine of Growth"⁴. Trade enables the consumption capacities of the developing nations and provide access to scares resources and worldwide market for the product without which these countries may find it difficult to grow⁵. The economic progress of most of the present industrially developed nations of the world is due to their ever-expanding foreign trade. For example, large and growing markets in U.K. and Europe led to rapid expansion of exports of primary producing countries like U.S.A., Canada, Australia, New Zealand, Argentina, Uruguay and South Africa. By 1870, one-third of British capital exports went to these countries to build railway, sink mine shafts and finance cattle and wheat ranches; by 1913 it amounted to two third (Nurkse 1961). Thus, during the first half of the 20th century the volume of world trade has increased despite of depressions and wars. In this connection, it is significant to mention that development of foreign trade is of crucial importance for the developing countries. For these countries, rapid industrialization is the prime solution for eradication of problems like unemployment

and poverty. But in the process of industrialization, a major obstacle is the lack of availability of capital goods, equipment and technical know-how. In order to meet the developmental requirement, developing countries in general and India in particular are facing severe balance of payment problem.

Econometrics Methodology and Data:

In the present study, an attempt has been made to examine the trade led growth theory in India. The effective way to explore connectivity in trade and economic growth would be the cointegration analysis between the variables. For the purpose quarterly time series data from 1996 to 2012 has been taken for the variables gross domestic production at factor cost, export and import of India. Data has been taken from various issues of Handbook of Statistics on Indian Economy and Press release on quarterly estimates of GDP of India from Central Statistical Organization.

It is a common practice in time-series analysis of economic data to test the null hypothesis of a unit root. Augmented Dickey Fuller test and Phillips Perron test have been used for detecting the order of integration. In the most of the studies on trade led growth the empirical work has been done by using Engel and Granger causality test and some others. In the present paper an attempt has been made to detect any cointegration in between GDP, export, Import trade balance and terms of trade during 1996 to 2012 based on quarterly data. The statistical concept of cointegration has spawned a large literature and with good reason. Many economic theories are concerned with equilibrium relationships in which one or more series are expected to act as attractors to each other.

Results of the study:

To detect unit root test in quarterly GDP, quarterly export, quarterly import, quarterly trade balance and quarterly total trade Augmented Dickey Fuller (ADF) and Phillips Perron (PP) tests have been used. The results are presented in table 1. In terms of original values PP and ADF test statistics reveals the fact that all the variables are stationary at level in terms of growth rate of quarterly data for all the variables. While the PP and ADF test statistics show that GDP, export, import, trade balance and total trade for the Indian economy is not stationary at level but stationary first difference. Hence these data sets are I(1) i.e. cointegrable of first order.

Table1: Stationary test for the variables : ADF and PP

Variable/ Test	Phillips-Perron Test		Augmented Dickey-Fuller test	
	In terms of original values at first difference@	In terms of growth at level #	In terms of original values at first difference @	In terms of growth at level #
GDP	-11.275*	-3.256***	-9.615*	-3.317***

Export	-8.294*	-3.949**	-7.388*	-5.281*
Import	-11.903*	-3.825**	-6.999*	-4.977*
Trade Balance	-19.322*	-4.622*	-8.523*	-4.938*
Total trade	-10.394*	-3.682**	-7.588*	-4.959*
Test critical values:				
1% level	-4.103	-4.110	-4.108	-4.115
5% level	-3.479	-3.482	-3.482	-3.485
10% level	-3.167	-3.169	-3.169	-3.170

*1 percent level, **5 percent level, **** 10 percent level

@ stationary at I(1); # represents stationary at I(0). Model: Trend and Intercept and 2nd lag

and Maximum Eigen value statistics are calculated for the cointegration of series and presented in table 2. The null hypothesis is of r cointegration relations against the alternative of k cointegrating relation, where k is the number of endogenous variables. To consider the hypothesis that the variables are not cointegrated ($r=0$) against the alternative of one or more cointegrating vectors ($r>0$), we have to consider the value of λ_{trace} .

Table 2: Johansen Cointegration test Trace and Maximum Eigen value

Model	Trace				Max-Eigen			
	Null hypothesis	Alternative hypothesis	λ_{trace} value	Critical Value (0.05)	Null hypothesis	Alternative hypothesis	λ_{max} value	Critical Value (0.05)
GDP, Export and Import (1 st Model)	$r=0$	$r>0$	33.440	29.797	$r=0$	$r=1$	20.363*	21.132
	$r\leq 1$	$r>1$	13.078*	15.495	$r=1$	$r=2$	12.382	14.265
	$r\leq 2$	$r>2$	0.696	3.841	$r=2$	$r=3$	0.696	3.841
GDP, Trade Balance and Total Trade (2 nd Model)	$r=0$	$r>0$	33.445	29.797	$r=0$	$r=1$	20.367*	21.132
	$r\leq 1$	$r>1$	13.079*	15.495	$r=1$	$r=2$	12.383	14.265
	$r\leq 2$	$r>2$	0.696	3.841	$r=2$	$r=3$	0.696	3.841
Quarterly Growth in GDP, Export and Import (3 rd Model)	$r=0$	$r>0$	37.811	29.797	$r=0$	$r=1$	18.610*	21.132
	$r\leq 1$	$r>1$	19.202	15.495	$r=1$	$r=2$	13.702	14.265
	$r\leq 2$	$r>2$	5.500*	3.841	$r=2$	$r=3$	5.500	3.841
Quarterly growth in GDP, trade balance and total trade (4 th Model)	$r=0$	$r>0$	43.301	29.797	$r=0$	$r=1$	24.340	21.132
	$r\leq 1$	$r>1$	18.960	15.495	$r=1$	$r=2$	13.449*	14.265
	$r\leq 2$	$r>2$	5.512*	3.841	$r=2$	$r=3$	5.512	3.841
Quarterly growth in GDP, export, import, trade balance and total of trade (5 th Model)	$r=0$	$r>0$	91.483	69.819	$r=0$	$r=1$	38.146	33.877
	$r\leq 1$	$r>1$	53.337	47.856	$r=1$	$r=2$	20.728*	27.584
	$r\leq 2$	$r>2$	32.609	29.797	$r=2$	$r=3$	17.283*	21.132
	$r\leq 3$	$r>3$	15.327	15.495	$r=3$	$r=4$	9.186*	14.265
	$r\leq 4$	$r>4$	6.141*	3.841	$r=4$	$r=5$	6.141	3.841

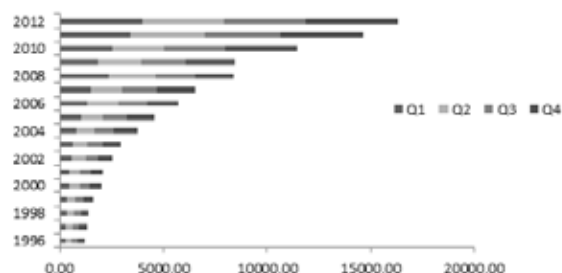
Note: * less than critical values

Table 2 indicates the value of λ_{trace} equal to each number of the cointegrating vector. For 1st model λ_{trace} for $r=0$ is 33.440, $r=1$ is 13.078 and $r=2$ is 0.696. Since the value of λ_{trace} (0) exceeds the critical value 29.797 at the 0.05 significance level, we can reject the null hypothesis of zero cointegrating vector. For model 2 we have found similar result. In case of quarterly growth rate of GDP, export growth and import growth (i.e. for Model 3) there are two cointegrating vectors. Trace statistics for Model 4 also reveals the fact that there are two cointegrating vectors. But for Model 5 (i.e. Quarterly growth in GDP, export, import, trade balance and total of trade) there are 4 cointegrating vectors.

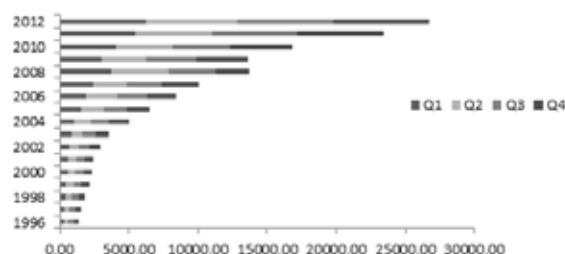
Conclusion:

In the present study we have taken quarterly data of five variables i.e. India's GDP, export, import, trade balance, total trade and their quarterly growth for the period 1996 to 2012. For detecting unit root we used two different test i.e. ADF and PP test. The tests suggest that unit root is present in all the five series of quarterly data at level. They are integrable at I(1) i.e. stationary at first difference. All the five series are reporting stationary at level in terms of quarterly growth rate. Johansen cointegration test (λ_{trace} value λ_{max} value) for five different models has been used for the cointegration of all the five variables under VAR framework. Cointegration test suggest for the model 5 (i.e. Quarterly Growth in GDP, export, import, trade balance and total trade) that there are four cointegrating vectors. The positive effect of trade liberalization results from positive effects of both import and export on economic growth.

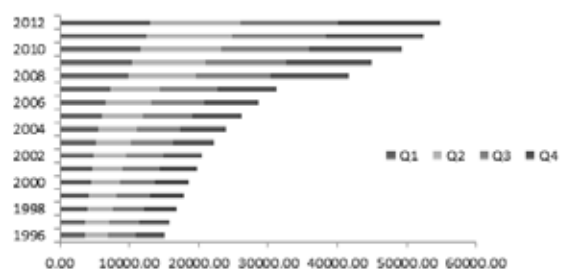
Graph 1: Quarterly India's Export from 1996 to 2012



Graph 2: Quarterly India's Import from 1996 to 2012



Graph 3: Quarterly India's Gross Domestic Production from 1996 to 2012



References:

1. Engle, R.F. and Granger, C.W.J., (1987), "Cointegration and Error Correction: Representation, Estimation and Testing", *Econometrica*, Vol. 55, pp.251-276.
2. Fuller, W.A., (1976), "Introduction to Statistical Time Series, John Wiley, New York.
3. Haberler, G., "International Trade and Economic Development", in James, D., Theberge (Ed.), "Economic of Trade and Development", John Wiley and Sons, New York, pp. 109-10.
4. Hsiao, M.C.W., (1987), "Tests of Causality and Exogeneity Between Exports and Economic Growth: The Case of Asian NICs", *Journal of Economic Development*, Vol. 12, No. 2, pp. 143-59.
5. Johansen, H., (1967), "The Possibility of Income Losses from Increased Efficiency or Factor Accumulation in the Presence of Tariffs", *Economic Journal*, Vol. 77, pp. 151-154.
6. Johansen, Soren, (1991), "Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models," *Econometrica*, 59, 1551-1580.
7. Kindleberger, C.P., (1958), "Economic Development", McGraw Hill, New York.
8. Krueger, A.O., (1995), "Trade Policies and Developing Nations", Washington: Brookings Institution.
9. Krugman, Paul R., (1979), "International Trade and Income Distribution: A Reconsideration", NBER Working Papers 0356, National Bureau of Economic Research, Inc.
10. Kuznets, S., (1966), "Modern Economic Growth", Oxford and IBH Publishing Co., New Delhi.
11. Lall, S. and Streeten, P., (1977), "Foreign Investment, Transnational and Developing Countries", Macmillan, London.
12. Lewis, W.A., (1960), "The Theory of Economic Growth", George Allen and Unwin, London.
13. Lewis, W.A., (1978), "The Evolution of the International Economic Order", Princeton University Press, Princeton, N.J., p. 74.
14. Meier, G.M. (1995), "Trade as an Engine of Growth-Note", in G.M. Meier (Ed.), "Leading Issues in Economic Development", Oxford University Press, Delhi, Sixth Edition, p. 461.
15. Meier, G.M. and Baldwin, R.E., (1957), "Economic Development", John Wiley and Sons Inc., New York.
16. Meier, G.M., (1968), "The International Economics of Development", Harper and Row, New York, p. 98.
17. Myint, H., (1954-55), "The Gains from International Trade and the Backward Countries", *Review of Economic Studies*, Vol. XXII, No. 2.
18. Nurkse, R. (1961), "Pattern of Trade and Development", Basil Blackwell Published, Oxford, p. 17.
19. Ohlin, B., (1933), "Interegional and International Trade", Harvard University Press, Cambridge.
20. Schumpeter, J.A., (1949), "Theory of Economic Development", Harvard University Press, Cambridge.
21. Statistical Outline of India (2002-03), Tata Service Limited, Department of Economic and Statistics, Bombay House, Mumbai, p. 269.
22. World Investment Report, (1995), "Transnational Corporations and Competitiveness", UNCTAD, United Nations Publication, Sales No. E 95.11A9, p. 229.