

Impact of Exports and Imports on Growth Rate of India: An Empirical Enquiry

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Abstract

The present paper is an attempt to find out the dependence of growth rate on the exports and imports during the entire reform period. The processes of reforms were introduced by the Government of India in July 1991 and the subsequent extensions of these reforms were carried out in later years. The period after 1991 has been marked by a substantial transformation in trade policy and the policy of trade is tilted towards export promotion and import substitution/restriction to achieve higher growth rate as one of the objectives of existing trade policy. Therefore, through the present endeavour, we try to establish a causal relationship among these variables vis-à-vis growth rate, exports and imports. In this paper, the results reveal that there is a positive relationship between growth rate and exports. The number of independent variables is not exhaustive, leaving an opportunity for further exploring the effect of various other macroeconomic variables on the growth rate of India.

Keywords: Exports, Imports, Musculoskeletal discomforts

Introduction

The impact of international trade on the economy has captured the minds of researchers and economists since ages. With the advent of Welfare Economics in late 1800's, improving the quality of life of people became the prime concern of policymakers. This could be achieved by increasing income, employment and production. Methods to increase economic growth became the subject matter of many researches. One of the methods proposed was international trade, which is now viewed as an important catalyst for economic growth in developing countries (Bhattacharya & Bhattacharya, 2011). Exports and imports play a vital role in providing an impetus to the growth of a country through the multiplier effect. This is a highly debated topic among researchers, since the effect of trade depends on a plethora of other factors such as infrastructure, trade policies, quality of human capital, etc.

India has a rich history of international trade and is gradually working to reap the benefits in the best possible manner. The Second World War adversely affected many countries, however, India's GDP continued to grow at 3.5 percent per annum and the per capita income growth averaged at 1.3 percent per annum. This is popularly known as the

“Hindu rate of Economic growth” which persisted till 1979-80 (Virmani, 2004). After independence in 1947, India started developing its domestic industries and had been described as an 'import substituting country par excellence' (Rodrik, 1996). The World Bank included India in the list of 'strongly inward-oriented' countries (Dutta & Ahmed, 2004). In 1980's, the Government of India adopted expansionary fiscal and monetary policies to boost the domestic demand. Growth surged at an average annual rate of 5.8 percent (Mukherjee, 2012). Consequently, India faced the problem of large current account deficit, along with high inflation and the Gulf War. This, in turn, led to a balance of payment crisis in 1991. With the help of recommendations from the IMF and World Bank, India entered into the phase of economic reforms and created a conducive environment for trade to flourish. Since then, the benefits of trade have been realized over time.

Nidugala (2000) said that exports enable an economy to specialize in the production of goods in which it has comparative advantage, resulting in optimal allocation of resources and enhanced overall productivity, can expand production possibilities through its effect on competition, access to new technologies and ideas. Imports also play a crucial role in stimulating growth of a country. They enable access to new technology, ideas and entrepreneurial skills. This assists in further production of goods and boosts exports. MacDonald (1994) stated that the imports of final and intermediate goods will force domestic producers to increase their productivity and efficiency by innovation to compete with foreign imports. Therefore, trade plays an important role in the growth of an economy. However, the results cannot be generalized for all countries because of different trade environments. The choice of period for analysis of the relationship between trade openness and GDP growth rate is also very important (Arif, et al., 2012). India's growth rate has been affected by major external shocks like a hike in international petroleum price which increased the value of imports, fall in world trade which adversely affected Indian exports. In 2001-02, the terrorist attack on the World Trade Centre caused a net loss of 0.25 percent of US GDP and also had an impact on India's exports, which grew only at 5 percent that year (Economic Survey of India, Ministry of Finance, 2001-02). The next major setback was the global recession of 2008. It had a cascading effect on overall economic growth, as India's GDP growth rate fell from 9.8 percent in 2007 to 3.9 percent in 2008. The impact of this crisis on the export sector was evident as India's exports, which were 15.1 percent of GDP in 2008 and plummeted to 12.4 percent in 2009 (Mukherjee, 2012).

In light of the above, it becomes highly significant to make an attempt to study the impact of exports and imports on growth rate. The present study examines the effect of

merchandise exports and imports on the growth rate of Indian economy for the period from 1991 to 2013. The model has been checked for heteroscedasticity, autocorrelation, multicollinearity and specification bias for the purpose of formulating future policies and strategies.

Review of literature

Export-led growth hypothesis has become a “new conventional wisdom” (Tyler, 1981 and Balassa, 1985). It has shaped the development of a number of countries and policies of the World Bank. Piana (2001) advocates that increase in exports are responsible to raise production, GDP and employment. Outward orientation makes it possible to use external capital for development and may assist with debt servicing. Export promotion may also eliminate controls that result in an overvaluation of the domestic currency (Giles & Williams, 2000). Mercan, Gocer, Bulut, and Dam (2013) analyzed the effect of trade openness on economic growth of the BRIC countries and Turkey and concluded that the effect of trade openness on economic growth was positive and statistically significant. Lal and Rajapatirana (1987) said that an outward-oriented strategy may provide greater opportunities to entrepreneurs which are the key to extended growth. Dollar (1992) found that per capita GDP growth was increased by outward-orientation. Studies of Ahmed and Anoruo (2000) provide an evidence of a positive relationship between openness of trade and GDP growth.

However, many researches fail to support a robust export-led growth hypothesis. According to Jung and Marshall (1985), export-led growth nexus is true in only four countries out of 37 developing countries. According to the finding of Thurayia (2004), increase in total exports of Saudi Arabia had a strong positive impact on its growth rate. Buffie (1992) points out that the experiences in the East and Southeast Asian countries are different in many ways and cannot necessarily be applied to other countries.

Research Methodology

Objective of the study

To study the cause and effect relationship of exports and imports on the growth rate of the Indian economy during the reform period.

Hypothesis

There is no significant impact of exports and imports on the growth rate of India during the study period from 2000 to 2013.

Source of Data

Secondary source has been used to collect the relevant data. Data has been collected from the official website of United Nations Economic & Social Commission for Asia and the

Pacific (UNESCAP). Exports and imports are measured as a percentage of GDP and only merchandise value of these variables are considered in our analysis. For the measurement of growth rate, average annual GDP growth rate is used since GDP growth is an important measure of economic growth for an economy.

Research Tools

To find out a proper relationship between the considered variables (Exports, Imports and Growth Rate), statistical tools like Unit Root test (to check the stationarity of economic variables), Pair wise Granger Causality Tests (to investigate the unidirectional and bidirectional relationship between variables), Cointegration test (to find out a long-term or

equilibrium relationship between variables) and regression analysis have been used. A multiple linear regression model is considered and exports and imports are regressed upon growth rates for India. The entire analysis is performed with Eviews 8 software.

Results and Discussion

First of all, we have to test whether our variables are stationary or non-stationary because a non-stationary time series may lead to the phenomenon of spurious and nonsense regression. The Augmented Dickey-Fuller (ADF) test is applied to check the stationarity of economic variables. The result of the test has been shown in Table-1.

Table-1 ADF Unit Root Test

	Variable		T-statistic	P value	Result
With Intercept	Exports	Lag Length = 0	-5.304238	0.0003	Stationary
	Imports	Lag Length = 0	-3.757062	0.0103	Stationary
	Growth Rate	Lag Length = 0	-4.508470	0.0019	Stationary

Table-2 reveals the result of stationary, which suggest the rejection of unit root null hypothesis of non-stationary for all the variables with intercept.

The granger causality test is used to examine the unidirectional and bidirectional relationship between variable and the result of the test is given in Table-2.

Table-2 Pair wise Granger Causality Tests

Null Hypothesis	F-Statistics	Prob.
GROWTH_RATE does not Granger Cause EXPORTS	9.03368	0.0024
EXPORTS do not Granger Cause GROWTH_RATE	7.24101	0.0055
IMPORTS do not Granger Cause EXPORTS	3.99297	0.0392
EXPORTS do not Granger Cause IMPORTS	2.19025	0.3297
IMPORTS do not Granger Cause GROWTH_RATE	4.28166	0.0046
GROWTH_RATE does not Granger Cause IMPORTS	4.40215	0.0065

The result of Granger Causality test shows that there is a bidirectional relationship between growth rate and exports; that means both the variables are affected by each other. In case of exports and imports, the obtained relationship is unidirectional and indicates that exports are affected by imports while imports are unaffected by the imports. The

Granger Causality test results between imports and growth rate are also reflecting a bidirectional relationship.

To examine a long-term relationship between economic variables, Engle-Granger (EG) Cointegration test is applied and the result of the test has been given in Table-3.

Table-3EG Cointegration Test

Null Hypothesis		Value	Prob.
Series are not cointegrated	Engle-Granger tau-statistic	-4.909345	0.0122
	Engle-Granger z-statistic	-22.17293	0.0162

Table-3 represents that the series are cointegrated, which propose the rejection of the null hypothesis of no cointegration that means all the variables are displaying a long-term relation and the regression equation of these economic variables is said to be balanced.

To validate the dependence of growth rate on exports and imports, a multiple linear regression analysis is developed in which both exports and imports are regressed upon the growth rate of India during the period of 1991-2013. The regression equation is as follows:

$$GR_i = \beta_1 + \beta_2 X_i + \beta_3 M_i + u_i$$

Where, GR = Growth_Rate, X = Exports, M = Imports and u

= Residual.

The result of a regression equation has been shown in Table-4. From the result, it is detected that our model is statistically significant (prob.= 0.023) at the 5 % level of significance and thirty one (31) percent of variation in growth rate is explained by the independent variables 'exports' and 'imports' (R-squared = 0.31). The value of Durbin-Watson state is very close to 2 (D-W = 1.99) therefore the regression equation is free from the problem of autocorrelation. On the basis of this result, the obtained regression equation is:

$$GR = 4.541475 + (0.006219)X + (0.087732)M$$

Table-4 Regression Equation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.541475	0.729538	6.225143	0.0000
EXPORTS	0.006219	0.036910	0.168482	0.8679
IMPORTS	0.087732	0.032395	2.708246	0.0135
R-squared	0.311518	Mean dependent var		6.291304
Adjusted R-squared	0.242670	S.D. dependent var		2.248821
S.E. of regression	1.957029	Akaike info criterion		4.301840
Sum squared resid	76.59926	Schwarz criterion		4.449948
Log likelihood	-46.47116	Hannan-Quinn criter.		4.339089
F-statistic	4.524717	Durbin-Watson stat		1.990818
Prob(F-statistic)	0.023929			

Dependent Variable: GROWTH_RATE

The coefficients of both the regressors are positively associated with the dependent variable and one percent increase in imports is responsible for 8.7% increase ($\beta_3 = .087$) in growth rate and it is statistically significant (prob = 0.0135). On the other hand, one percent increase in exports is accountable for only 0.6% increase ($\beta_2 = .006$) in growth

rate. The value of the coefficient of exports (β_2) is statistically insignificant (prob=0.8679).

To confirm that the regression model used in the analysis is correctly specified, Ramsey's RESET is applied in the above model. Result of the Ramsey's RESET has been given in Table-5.

Table-5 Ramsey's RESET Test

	Value	df	Probability
<u>F-statistic</u>	2.019776	(2, 18)	0.1617
<u>Likelihood ratio</u>	4.656738	2	0.0975

The computed value of F-statistic is insignificant (prob. = 0.16), and therefore, the null-hypothesis of misspecification of the model is rejected and the relationship between dependent and independent variables is correctly specified in the above used model.

To verify that there is no multicollinearity among the regressors included in the regression model, Tolerance (TOL) and Variance Inflation Factor (VIF) of the independent variable is calculated and the result has been depicted in Table-6.

Table-6 TOL and VIF

Variable	VIF	Tolerance = 1/VIF
C	3.196160	0.312875
EXPORTS	2.312317	0.432466
IMPORTS	2.474292	0.404156

From the result given in Table-6, we can see that there is no evidence of correlation among the regressors because the value of VIF for both the variables is less than 10 and the TOL is closer to 1 (Gujarati & Sangeetha, 2007). Therefore the regression model is fulfilling the assumption of no multicollinearity.

An important assumption of the classical linear regression model is that the disturbance (residual) term u_i is homoscedastic; that is, they all have the same variance. For the validity of this assumption, White's Heteroscedasticity Test is applied in the regression equation and the result is given in Table-7.

Table-7 White's Heteroscedasticity Test

F-statistic	1.056894	Prob. F(5,17)	0.4176
Obs*R-squared	5.454148	Prob. Chi-Square(5)	0.3630
Scaled explained SS	2.130431	Prob. Chi-Square(5)	0.8308

Table-7 shows the result of homoscedasticity, which proposes the acceptance of the null hypothesis of no heteroscedasticity at 5 % level of significance. With the help of all these tests, it is verified that the developed regression model between regressor and regress and is satisfying all the assumption of Classical Linear Regression Model (CLRM) and the regression equation is accomplishing the objective of the present paper.

Conclusion

It has been observed that in the determination of growth rate of Indian Economy during the reform period exports and imports have contributed significantly. From the result of regression equation, it is observed that the growth rate is more affected by imports rather than exports. It is only because of the composition of imports, which reveal that imports of raw materials, intermediate manufacturers and capital goods constitute a larger part of total imports. Most of these items are used to increase production as well as productivity and finally help to increase the export capacity of Indian Economy. The pair-wise Granger Causality test also provides the same result that exports are affected by imports.

The study, therefore, concludes that either the export promotion or the import substitution policy is not appropriate to achieve higher growth rates for Indian Economy. To place the Indian Economy on the trajectory of higher growth rate, an adequate policy should be framed

with a proper combination of exports and imports.

Limitations

The present study suffers from certain drawbacks such as limited number of independent variables and the result of analysis entirely depends on the quality of data. Prospective researchers can investigate the effect of various other macroeconomic variables such as interest rate, the strength of domestic currency, real wage rate, rate of employment, inflation rate, etc. on the growth rate of India.

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