

## **A POST REFORM SCENARIO OF EXPORT INTENSITY AND COMPETITIVENESS IN INDIA: AN EMPIRICAL STUDY**

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### **ABSTRACT**

A country has trade relations with one or more than one country overtime. The GDP of any country has changed overtime, so also the trade (exports/ imports) value. Change in trade value is caused by change in GDP other things remaining the same. Trade (exports/imports) intensity of a country is the ratio between trade value (exports/imports) and the GDP Trade intensity is one of the important indicators of a country which reflect the country's growth and development in the context of international perspective.

India is one of the important countries in South-East Asia. This country is now emerging economy in the world. In this economy the GDP has changed over time, so also the trade (exports / imports) value. Therefore, in this context this paper examines the relationship between the trade value and the GDP in terms of trade intensity, trade openness and competitiveness during reform period in the economy of India.

Trade intensity (export / import) can be defined as the ratio between the trade value and the GDP. Openness of trade is the ratio between total trade value (exports plus imports) and the GDP. On the other hand, export and import competitiveness represent the relationship between exports or imports with GDP. Export intensity is discussed in Section I, growth of export intensity is measured in section II and export competitiveness in Section III and. Section IV includes concluding remarks.

## Introduction

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India is one of the important countries in South-East Asia. This country is now emerging economy in the world. In this economy the GDP has changed over time, so also the trade (exports / imports) value. Therefore, in this context this paper examines the relationship between the export value and the GDP in terms of export intensity, and competitiveness during the period of 1990/91-2011/12 in the economy of India.

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### Section I: Export Intensity:

Intensity of trade (exports or imports) of a country is the ratio between the trade value and the GDP. So, we have two types of intensity: export intensity ( $E_i$ ) and import intensity ( $M_i$ ):

$$E_i = E/GDP; \quad E_i=0; \quad \text{for } E=0, \quad E_i=1 \text{ for } E=GDP; \quad 0 \leq E_i \leq 1.$$

$E=0$  means the country is closed and it has not exported anything to the world. Again  $E=GDP$  is a situation when total produced Gross Domestic Product has exported. That means there is no domestic demand.

### Estimates:

Based on the available the trade (exports and imports) data and the GDP data in India during 1990/91-2011/12 we have estimated the export intensity at the aggregate level. At the disaggregative level we have also estimated the export intensity in respect of agricultural exports, industrial exports and service exports during the period of 1990/91-2011/12. The estimates are shown in Tables 1.

**a) Total exports:**

Our estimates (Table 1) reveal that in India export intensity has increased from 0.024 in 1990/91 to 0.087 in 2000/01 and to 0.282 in 2011/12. Export intensity has been grown at the rate of 10.68% in India during the period of time.

**b) Agricultural Exports:**

Our estimates (Table 1) reveal that agricultural export intensity has increased from 0.019 in 1990/91 to 0.062 in 2000/01 and to 0.302 in 2011/12. Agricultural exports intensity has grown at 11.88% a year.

**c) Manufacturing Exports:**

Manufacturing export intensity ((Table 1) has increased from 0.088 in 1990/91 to 0.341 in 2000/01 and to 1.156 in 2011/12. Industrial export intensity has grown at the rate of 11.29% a year.

**d) Service Exports:**

In India Service export intensity (Table 1) has increased from 0.001 in 1990/91 to 0.004 in 2000/01 and to 0.026 in 2011/12 in India. Service export intensity has grown at the rate of 18.74% a year.

**Section II: Growth of Export Intensity**

Export Intensity (EI) is defined as the ratio between Export (E) and GDP (D) at time t. That is,

$$EI_t = E_t / D_t \text{ ----- (1)}$$

Taking log on both sides of equation (1) we have:

$$\text{Log } EI_t = \text{Log } (E_t / D_t) \text{ ----- (2)}$$

$$\text{Log } EI_t = \text{Log } E_t - \text{Log } D_t \text{ ----- (3)}$$

Taking total differentiation of equation (3) with respect to time 't' we get:

$$d(\text{Log } EI_t) / dt = d(\text{Log } E_t) / dt - d(\text{Log } D_t) / dt$$

$$(dEI_t / dt) / EI_t = (dE_t / dt) / E_t - (dD_t / dt) / D_t$$

$$G_{EI} = G_E - G_D \text{ where } G_{EI} = \text{ : growth rate of export intensity}$$

Equation (4) implies the growth rate of export intensity ( $G_{EI}$ ) is the difference between the growth rates of Export ( $G_E$ ) and GDP ( $G_D$ ). Now the sign of growth rate of export depends on the resultant effects of growth rates of export and GDP. We can think about two cases here as follows:

Case I:  $G_{EI} > 0$  : The growth rate of export intensity is positive when (a)  $G_E > 0, G_D > 0$  but  $G_E > G_D$ . (b)  $G_E > 0, G_D < 0$ , (c)  $G_E < 0$  and  $G_D < 0$  but  $|G_E| < |G_D|$ . Thus both (a) and (b) are viable from the economy point of view. But (c) is not feasible.

Case II:  $G_{EI} < 0$ : The growth rate of export intensity is negative growth rate when (a)  $G_E > 0, G_D > 0$  but  $G_E < G_D$ . (b)  $G_E < 0, G_D < 0$  but  $|G_E| > |G_D|$ , (c)  $G_E < 0$  and  $G_D > 0$ . All these cases are not feasible for the development of any economy.

Our estimates (Table 2) reveal that the growth rates of exports, GDP and intensity in both aggregative and dis-aggregative levels are positive and this implies feasibility condition for development.

### Section III: Export Competitiveness

Exports of a country are deemed to be competitive if the country is able to sell its products at a lower or same price and earn the same return as its competitors. Export competitiveness of a country is determined by the following factors:

- (i) favourite endowment base in the economy,
- (ii) lower cost consideration,
- (iii) better quality of the commodity produced,
- (iv) remuneration of factors of production,
- (v) exchange rate,
- (vi) productivity through the use of better technical skills and human resource development,
- (vii) economies of scale and institutional
- (viii) policy mechanisms.

In this section we examine the export competitiveness in India during 1990-2011/12. Overall exports depend on the Gross Domestic Product (GDP) of the economy at a particular period of time. More GDP leads to more exports. If the GDP increases, then after meeting domestic demand the surplus will lead to increase in exports. Similarly, GDP of any sector leads to increase in exports of that sector. So, increase in agricultural GDP may bring about increase in agricultural exports. Overall exports depend on the Gross Domestic Product (GDP) of the economy at a particular period of time. More GDP leads to more exports. If the GDP increases, then after meeting domestic demand the surplus will lead to increase in exports. The functional relationship between GDP and overall exports can be expressed by Log-Log model as:

$$\text{Log (overall exports)} = A + B \text{ Log (GDP)} \text{ ----- (4)}$$

The estimated value of B indicates the GDP elasticity of exports. Positive value of B indicates direct relationship between GDP and overall exports and vice versa. If the value B is greater than unity, then it implies rise in exports more than proportionately with increase in GDP. On the other hand, if the value of B is less than unity then it implies exports increase less than proportionately with increase in GDP.

Here the estimated coefficients are statistically significant. The coefficients (Table 4) are positive and greater than unity in all the cases which indicate exports have increased more than proportionately

with increase in GDP . The estimated values of the coefficients are greater in period I (1990/91-2000/01) than in period II (2000/01-2011/12).

Now to test whether there is any true relationship between exports and GDP in aggregative level or not we have done Johansen Co-integration test by using E-views software. The results of co-integration are showed in Table 4. Since the time period is less than 30 years so unit root test for checking stationary of the time series variables is not required. We have also found the direction of relationship. That means whether exports depends on GDP or GDP depends on exports by using pair-wise Granger causality test. On the basis of these results we can conclude whether India's growth is "Export-led Growth" or "Growth-led-exports".

In all the cases we have also estimate the equation in two ways: (i) taking GDP as independent variable and exports as dependent variable and (ii) taking exports as independent variable and GDP as dependent variable.

According to our estimation (Table 4) we find that GDP and exports in aggregative level are related to each other. Also in all the cases we have found Granger causality test implies GDP is a function of exports. So we can conclude India's growth rate is export-led.

#### **Section IV. Concluding Remarks:**

The GDP and the exports value have increased in the economy of India over time. The export intensity has increased during 1990/91-2011/12 at the aggregate level as well as the disaggregate levels. In respect of export competitiveness we observe that Indian exports are more competitive in respects of overall exports, agricultural exports, manufacturing exports and service exports. In second generation reforms period (2000/01 onwards) emphasis have been given on manufacturing goods production as well as exports of manufacturing goods and in this time period manufacturing sector has grown at the cost of agricultural sector due to implementation of WTO policies. But in emerging economy like India simultaneous development of all the sectors and improvement of exports in all the sectors is very much required for meeting the balance of payment crisis and reducing the inequality and imbalance growth.

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Table 1: Trade Intensity in India during 1990/91-11/12

Year	Primary Exports intensity	Secondary Exports intensity	Tertiary Exports intensity	Total Exports intensity
1990-91	0.019	0.088	0.001	0.024
1991-92	0.026	0.121	0.001	0.032
1992-93	0.027	0.147	0.001	0.037
1993-94	0.036	0.175	0.001	0.046
1994-95	0.036	0.194	0.001	0.051
1995-96	0.054	0.212	0.001	0.061
1996-97	0.058	0.217	0.001	0.063
1997-98	0.060	0.238	0.001	0.067
1998-99	0.057	0.251	0.002	0.067
1999-00	0.054	0.282	0.002	0.071
2000-01	0.062	0.341	0.004	0.087
2001-02	0.062	0.342	0.004	0.085
2002-03	0.081	0.392	0.004	0.099
2003-04	0.081	0.428	0.005	0.106
2004-05	0.108	0.506	0.006	0.126
2005-06	0.122	0.572	0.006	0.140
2006-07	0.144	0.637	0.006	0.160
2007-08	0.169	0.657	0.007	0.168
2008-09	0.178	0.824	0.013	0.202
2009-10	0.189	0.745	0.014	0.188
2010-11	0.211	0.932	0.026	0.234
2011-12	0.302	1.156	0.026	0.282

Source: Data from Reserve Bank of India. Estimates by Scholars.

**Table 2: Annual Compound Growth Rate of GDP, Exports and Export Intensities in Aggregative and Dis-aggregative Level**

Items	Total Period	Period I	Period II
Primary Export	15.38	15.56	18.84
Primary GDP	2.92	3.18	3.23
Primary Export Intensity	11.38	12.00	14.94
Secondary Export	18.68	19.30	19.97
Secondary GDP	6.62	6.48	7.52
Secondary export intensity	11.29	12.04	11.49
Service Export	28.12	23.97	28.71
Service GDP	8.40	7.47	9.36
Service Export intensity	18.74	15.35	19.66
Total exports	18.30	18.63	20.14
Total GDP	6.86	6.13	7.88
Total export Intensity	10.68	11.78	11.37

Source: Same as in Table 1

**Table 3: Log-Log Regression Model of Trade and GDP during 1990/91-2011/12**

Trade	1990/91-2011/12			1990/91-2000/01			2000/01-2011/12		
	Constant	Coefficient	R <sup>2</sup>	Constant	Coefficient	R <sup>2</sup>	Constant	Coefficient	R <sup>2</sup>
Exports	-17.91	2.53	0.99	-20.77	2.82	0.95	-16.62	2.42	0.99

Source: Same as Table 1

**Table 4: Statistical results**



## Estimated Equations: GDP-EXPORTS

Dependent Variable: LNGDP				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNEXPORTS	1.296703	0.027349	47.41276	0.0000
R-squared	-4.426467	Mean dependent variable		10.12157
Adjusted R-squared	-4.426467	S.D. dependent variable		0.428210
S.E. of regression	0.997506	Akaike info criterion		2.877272
Sum squared residual	20.89539	Schwarz criterion		2.926865
Log likelihood	-30.64999	Durbin-Watson stat		0.042111

Dependent Variable: LNEXPORTS				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGDP	0.764049	0.016115	47.41276	0.0000
R-squared	0.506293	Mean dependent variable		7.702816
Adjusted R-squared	0.506293	S.D. dependent variable		1.089736
S.E. of regression	0.765695	Akaike info criterion		2.348324
Sum squared residual	12.31207	Schwarz criterion		2.397917
Log likelihood	-24.83156	Durbin-Watson stat		0.042697

## JOHANSEN COINTEGRATION TEST

Sample (adjusted): 3 22  
 Included observations: 20 after adjustments  
 Trend assumption: Linear deterministic trend  
 Series: LNGDP LNEXPORTS  
 Lags interval (in first differences): 1 to 1  
 Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.621397	20.30047	15.49471	0.0087
At most 1	0.042813	0.875136	3.841466	0.3495

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.621397	19.42534	14.26460	0.0070
At most 1	0.042813	0.875136	3.841466	0.3495

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

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by  $b^*S_{11}^{-1}b=I$ ):

LNGDP	LNEXPORTS
-33.95794	14.48810
12.69617	-3.934472

Unrestricted Adjustment Coefficients (alpha):

D(LNGDP)	0.005854	0.002342
D(LNEXPORTS)	-0.053551	0.007128

1 Cointegrating Equation(s): Log likelihood 90.62202

Normalized cointegrating coefficients (standard error in parentheses)

LNGDP	LNEXPORTS
1.000000	-0.426648
	(0.00798)

Adjustment coefficients (standard error in parentheses)

D(LNGDP)	-0.198792
	(0.10362)

D(LNEXPORTS)	1.818493
	(0.45986)

<b>Pair-wise Granger Causality Tests</b>			
Null Hypothesis:	Observation	F-Statistic	Probability
LNEXPORTS does not Granger Cause LNGDP	20	2.21587	0.14350
LNGDP does not Granger Cause LNEXPORTS		8.64777	0.00318