



## GLOBALIZATION, INTERNATIONAL COMPETITIVENESS AND ECONOMIC GROWTH: A PANEL DATA ANALYSIS

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### **Abstract**

*In the fastly globalizing world, there is greater need for more economic opinions which involves the reduction in trade-tariffs. There is relationship between level of economic growth and competitiveness. Globalization is expected to provide a level-playing field for better competitiveness in both the intra country and intercountry conditions. Over the years, there has been rise in income levels and sectoral shares of GDP and employment. The countries specific results indicate that tariff rates play a greater role in the UMIG and HIG countries than in LIG and LMIG countries. Hence, there is greater need of openness in the LIG and LMIG groups of countries and a positive and direct link between higher imports and higher exports.*

### **I. Introduction**

In a highly interdependent world, nation states recognize the need to more economic openness. Openness of the economy involves reducing trade barriers, especially the tariff rates by the countries. This directly invokes the virtue of better competitiveness in both intra-country and inter-country conditions. Pressures of global interdependence generate Opportunities for continuous innovation, upgrading of industrial skills and technology, supply of skilled labour and access to various kinds of infrastructural resources [Ghosh, 2005]. Hence, not only tariff rate reduction, but these factors also provide more competing edge to the economies which will certainly help them in attaining growth rate. Thus, the greater is the integration of an economy with the rest of the world in trade, investment and finances, the greater is likely to be the interdependence in growth [Srinivasan, 2006].

Many authors have underscored the relevance of better competitiveness in attaining higher economic growth. This paper aims to trace the impact of falling tariff rates on exports and imports and also on the level of income, separately for 30 countries over a period of 20 years, from 1985 to 2005 with the help of econometric models. The objectives of this paper are to trace the growth of income level, exports, imports, sectoral shares in national income and employment and tariff rate in the selected countries over the time period and secondly to econometrically estimate the relationship between tariff rates and economic growth for different time periods and to individual countries.

Next section explains the methodology the development and trade indicators of the countries are analyzed in section three and section four presents the estimated results which is followed by conclusion.

### **II. Methodology: Selection Of Countries, Variables And Date Sources**

To analyze and to empirically estimate the relationship between level of economic growth and competitiveness, 30 countries have been selected. The mean tariff rates of the selected countries are taken as proxy for international competitiveness. Mean tariff rate is an important condition for competitiveness though not a sufficient condition, since there are other factors as well. World Bank provides annual data for 130-odd countries, which are classified into Low-Income Group (LIG), Lower-Middle Income Group (LMIG), Upper-Middle Income Group (UMIG) and High-Income Group (HIG). These classifications are based on Per Capita Income (PCI) levels in the concerned year. Over the years, countries have moved from one group to another, though not necessarily upwards. Hence, from each group, 25 per cent of the countries have been selected as simple, based on 1990 PCI. Selected countries account for 90 per cent of world Gross Domestic Product (GDP) and more than 85 per cent of world population.

Variables such as PCI, exports and imports as a proportion of GDP, sectoral shares in GDP and employment and mean tariff rates have been selected to analyze the competitiveness and growth pattern of the selected countries. Data for these variables have been gathered for the years 1985, 1990, 1995, 2000 and 2005. This will help in tracing the changing pattern of growth and development of these countries along with their pattern of trade. The mean tariff rate is typically higher in developing countries which mostly follow inward-looking import substituting policy. Such policy directly reduces both intra-country and inter-country competitiveness. When these countries switch over to outward-looking export promoting policy, the mean tariff rates in those countries drop. This accompanies higher trade and economic growth of the countries concerned. Thus, it is hypothesized that lesser the tariff rate, higher will be the rate of economic growth.



To econometrically test the relationship between economic growth, tariff and trade, data on GDP, exports and imports of the countries for the chosen years have been collected from the World Bank publications like World Development Report and World Development Indicators.

### III. Development And Trade Indicators Of Selected Countries

Table 1 presents the data of PCI, exports and imports as percentage of GDP, sectoral shares in GDP and employment and mean tariff rates for major country-groups (basic country-specific data are given in Annexure Tables). The mean tariff rates and per capita GDP levels of the country groups for the selected time periods are graphically presented in Chart-1 and Chart-2 respectively.

In 1985, mean PCI levels of all country-groups, except that of LIG, have declined and thus, the all-countries' mean PCI has come down from \$ 3191 to \$ 3003 in 1985. In the same year, there is a considerable fall particularly in exports of all country-groups, again except LIG. Thus, the mean exports have decreased from 19 to 14 percent. This suggests a positive relationship between trade and income level. Moreover, the mean tariff rates of the country-groups also suggest that the mean PCI levels are low in those groups in which the tariff rates are high and *vice versa*. This clearly indicates that lower tariff rates or better competitiveness augment trade and facilitate higher income level. This hypothesis has further been strengthened during 1990. Levels of PCI of all country-groups have gone up in this year compared to 1985, while the mean tariff rates have come down. The mean PCI levels of all groups have increased and their percentage deviations from all-countries' mean PCI ranges from 6.4 per cent for LIG to 388 per cent in the case of HIG. This implies an increasing spread of income levels of the country-groups around the all-countries' mean. This indicates that the rate of increase in the LIG's PCI is less than that of other country-groups. Moreover,

**Table 1, Selected Development Indicators of Country-group, 1985-2005**

Per Country-Groups	Exports Capital GNP \$	Imports as% of GDP	Sector-wise Shares in					Mean		Tariff
			GDP			Employment				
	as% of GDP	as% of GDP	Agri.	Ind.	Ser.	Agri.	Ind.	Ser.		
<b>1985</b>										
Low-Income	293	15	21	34	26	40	N.A.	N.A.	N.A.	55.9
Lower-Middle	920	16	18	22	32	46	N.A.	N.A.	N.A.	25.1
Upper-Middle	2118	18	22	12	41	47	N.A.	N.A.	N.A.	17.5
High-Income	10575	14	16	3	37	60	N.A.	N.A.	N.A.	10.9
ALL COUNTRIES	3003	14	19	19	34	47	-	-	-	27.4
CV (in %)	139	57	52	77	27	22	-	-	-	64
<b>1990</b>										
Low-Income	312	20	22	33	29	38	66	13	21	46.6
Lower-Middle	1549	21	25	15	37	48	35	24	41	18.0
Upper-Middle	3415	19	21	8	42	50	30	51	19	14.5
High-Income	18755	15	16	3	34	63	5	33	62	8.0
ALL COUNTRIES	4833	20	21	17	35	48	37	23	40	21.8
CV (in %)	152	67	59	83	28	24	72	44	46	59
<b>1995</b>										
Low-Income	368	21	28	31	31	38	60	16	24	28.7
Lower-Middle	1830	19	27	15	35	50	30	28	42	20.7
Upper-Middle	4408	31	31	9	33	58	19	32	49	11.7
High-Income	22035	19	20	3	33	64	6	39	55	7.1
ALL COUNTRIES	7209	21	26	16	33	51	31	28	41	17.1
CV (in %)	145	70	61	83	27	26	79	38	37	57
<b>2000</b>										
Low-Income	371	19	20	28	28	44	55	15	30	18.3
Lower-Middle	1401	30	29	14	38	48	36	23	41	14.4
Upper-Middle	4064	31	30	7	33	60	19	32	49	11.3
High-Income	22631	21	23	3	30	67	5	38	57	4.8
ALL COUNTRIES	7409	25	25	13	32	55	29	27	44	12.2
CV (in %)	142	75	60	85	30	23	79	39	33	60
<b>2005</b>										
Low-Income	490	20	27	26	28	46	N.A.	N.A.	N.A.	15.8



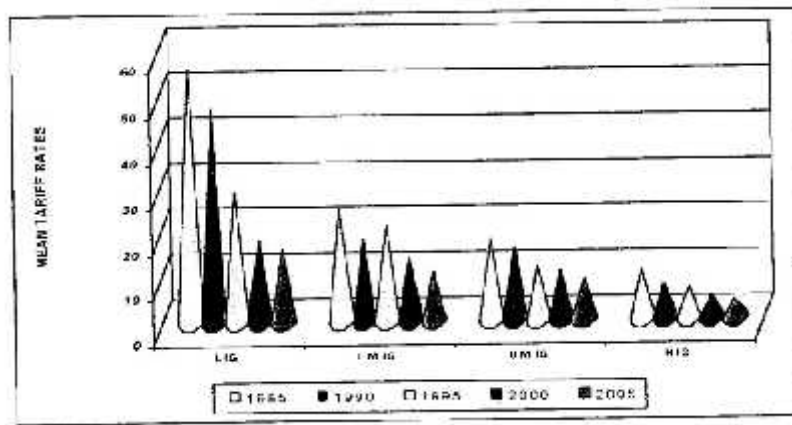
Lower-Middle	1995	31	30	13	41	46	N.A.	N.A.	N.A.	11.3
Upper-Middle	5587	38	38	7	33	60	N.A.	N.A.	N.A.	9.4
High-Income	31465	22	23	2	28	70	N.A.	N.A.	N.A.	4.6
ALL COUNTRIES	10221	28	29	12	33	55	-	-	-	10.3
CV (in %)	138	70	57	86	33	25	-	-	-	57

Note: CV- Co-efficient of Variation. N.A. Not Available.

Source: Computed from Annexure Tables – A1 to A5

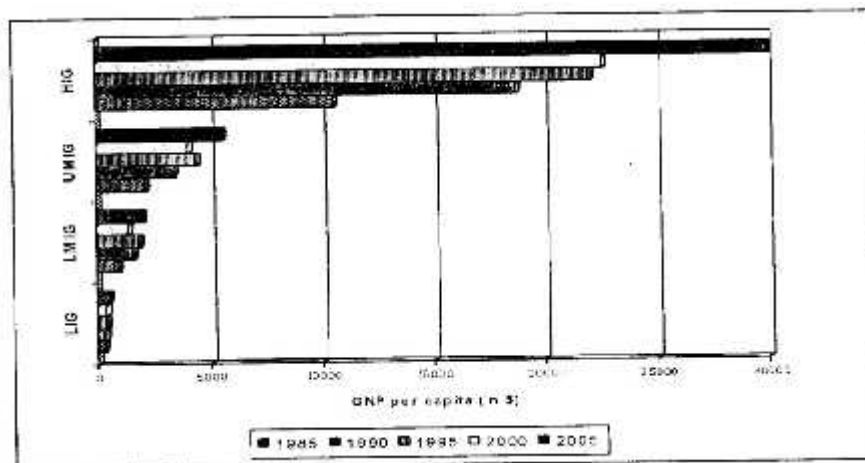
exports and imports of all groups too have gone up in 1990. Sectoral GDP shift shows that the contribution of agriculture has declined among all country-groups, while that of industries has increased only in the case of LIG. Share of service sector has gone up among all groups. Along with these shifts, sectoral employment shares too have shifted. The decline in the employment share of agriculture has led to a corresponding rise in industries and services sector employment only in LIG and LMIG. In the other two groups, the shares of both agriculture and industries have decreased in 1990 compared to 1985.

**Chart 1, Mean Tariff Rates of Country-Groups, 1985-2005**



In 1995 also, the rise in mean PCI levels and decline in the tariff rates of the groups have occurred simultaneously. This decline has taken place among all country-groups, while the fall is sharper in the LIG due to higher base rate. This has led to a fall in the all countries' mean tariff from 21.8 to 17.1. Over the years, the sectoral share of agriculture has further come down in LIG, while in the case of UMG and HIG, share of tertiary sector has further gone up. There have been commensurate shifts in the sectoral employment shares. Data also show that

**Chart 2, Per Capita GNP of Country-groups, 1985-2005**





there is considerable amount of variation in the mean income levels of countries. As the sectoral shares of GDP shift, CV in agricultural GDP increases, while that of other two sectors decline. This implies that GDP share of tertiary sector of not only UMIG and HIG, but also that of LIG and LMIG is rising fast.

In 2000, mean income levels of all but the HIG have declined, though those of all-countries' mean income has gone up. In this year, the link between income level and tariff rate gets blurred, since, while the latter has declined across-the-board, the former has not reacted accordingly. However, country-specific data (see Annexure Tables) do suggest that those countries, whose tariff rates have declined, are able to achieve not only higher level of income, but also moved upwards from the LIG. The cases of China and Sri Lanka can be cited as examples.

The income levels of all country-groups have gone up in 2005 by a notable margin. This secular rise has resulted in a sizeable increase in the mean income of all-countries from \$ 7409 to \$ 10221. A clearer picture of the link between rising income level and declining tariff rates now emerges as it has occurred among all country-groups. Hence, the all-countries mean tariff rate has touched the lowest level of 10.3 in 2005. Moreover, unlike in agriculture, there is a greater convergence in the GDP shares of industries and services sectors among the groups. The country-specific data also reveal that (Annexure Tables) in those countries where the mean tariff rates have fallen considerably and share of industrial sector in both income and employment has gone up. Mean scores of not only exports but also imports of LMIG and UMIG have increased more steeply than that of LIG over the years. Higher exports imply a better competitiveness of countries in the global market, while higher imports suggest the better competitiveness in the domestic market. Data also reveal that those countries which have exported more and with a higher PCI, have also imported more. This indicates that greater openness leads to higher income level and also development.

#### IV. Uni-Variate Model And Estimation

In this section the relationship between economic growth and competitiveness is econometrically estimated. For this purpose, a uni-variate linear regression model is specified and estimated. This model hypothesizes that the GDP of a country in a given year depends on its mean tariff rate in that year. Econometrically,

$$GDP_i = \alpha + \beta TAR_i + U_i(1)$$

where,  $\alpha$  is the intercept term,  $\beta$  is the slope co-efficient and  $U_i$  is the normal error term. In this model, along with tariff (TAR) trade is not taken as another explanatory variable, since TAR works, via exports and imports and thus, it will result in multi-collinearity. Moreover, as the GDP values are in huge volume, it is taken in its log form. Thus, the model becomes semi-log and specified as:

$$\log GDP_i = \alpha + \beta TAR_i + U_i(2)$$

Initially, this semi-log model is estimated for all countries taken together, but separately for each time period, to find out the impact of changing tariff rate on growth over the time period. The time-specific uni-variate estimates are given in Table 2 for the model specified in equation 2.

Results show that in all the time periods, the explanatory variable viz., the mean tariff rate (TAR) is significant at 1 per cent level with the anticipated sign (negative). The slope co-efficient also indicates that as the time period goes up from 1985 to 2005, its magnitude also increases. This underscores the growing importance and relevance of competitiveness in attaining higher economic growth. Hence, the magnitude of adjusted  $R^2$  also goes up from 0.35 to 0.52.

**Table 2, Uni-variate Regression Estimates: Time-specific**

Year	Intercept	$\beta$	$t$	$t$	Adj. $R^2$	F	N
1985	7.90	28.99	-0.03	4.04 <sup>c</sup>	0.35	16.34 <sup>c</sup>	30
1990	8.38	25.55	-0.04	4.34 <sup>c</sup>	0.38	18.89 <sup>c</sup>	30
1995	9.04	21.60	-0.08	4.12 <sup>c</sup>	0.36	16.96 <sup>c</sup>	30
2000	9.74	21.88	-0.16	5.15 <sup>c</sup>	0.48	26.55 <sup>c</sup>	30
2005	10.45	22.87	-0.23	5.64 <sup>c</sup>	0.52	31.87 <sup>c</sup>	30
All	8.52	56.40	-0.05	8.25 <sup>c</sup>	0.31	68.07 <sup>c</sup>	150

Note: <sup>a</sup>, <sup>b</sup> and <sup>c</sup> indicate levels of significance at 10, 5 and 1 per cent respectively.

Source: Computed from Annexure Tables A1 to A5.



**Table 3, Uni-variate Regression Results: Country-specific**

Country	Intercept	't'	't'	Adj. R <sup>2</sup>	F	d w	
Bangladesh	5.91	28.84	-0.01	2.47 <sup>a</sup>	0.56	6.12	1.77
China	7.68	34.4	-0.04	6.13 <sup>c</sup>	0.90	37.5	2.50
India	6.52	29.2	-0.01	2.66 <sup>a</sup>	0.60	7.07	1.61
Indonesia	7.30	16.45	-0.05	1.64	0.29	2.70	3.15
Malawi	5.01	162.3	-0.004	3.79 <sup>b</sup>	0.77	14.36	3.21
Nigeria	6.93	11.87	-0.04	1.76	0.34	3.10	1.29
Pakistan	6.46	30.72	-0.01	1.86	0.38	3.44	2.97
Sri Lanka	7.29	49.3	-0.04	6.17 <sup>c</sup>	0.90	38.1	3.49
Tanzania	6.18	11.74	-0.05	2.14	0.47	4.59	2.01
Zambia	6.44	12.92	-0.03	0.94	-0.03	0.88	2.31
Algeria	8.70	14.93	-0.05	1.83	0.37	3.34	1.18
Argentina	11.76	3.78	-0.28	1.11	0.06	1.23	0.93
Colombia	6.76	22.61	0.07	2.29 <sup>a</sup>	0.52	5.28	1.12
Egypt	8.17	34.6	-0.05	5.97 <sup>c</sup>	0.89	35.72	2.25
Malaysia	8.86	37.49	-0.06	3.73 <sup>b</sup>	0.76	13.38	3.59
Mexico	7.52	3.08	0.05	0.27	-0.30	0.07	0.49
Philippines	7.16	26.63	-0.02	1.53	0.25	2.33	2.27
Poland	11.65	8.39	-0.35	2.61 <sup>a</sup>	0.59	6.82	0.87
Thailand	8.06	14.2	-0.02	1.21	0.10	1.46	2.10
Turkey	8.75	14.0	-0.12	1.81	0.36	3.29	1.67
Brazil	8.53	79.1	-0.03	6.12 <sup>c</sup>	0.90	37.42	2.07
S. Korea	10.38	35.14	-0.13	5.79 <sup>c</sup>	0.89	33.50	3.48
S. Africa	9.27	18.55	-0.11	2.63 <sup>a</sup>	0.60	6.92	1.78
Portugal	9.67	33.8	-0.08	3.81 <sup>b</sup>	0.77	14.51	2.16
France	10.94	35.97	-0.15	3.62 <sup>b</sup>	0.75	13.11	2.76
Germany	10.90	32.24	-0.13	2.86 <sup>a</sup>	0.64	8.19	2.59
Italy	10.79	43.26	-0.15	4.82 <sup>c</sup>	0.85	23.24	2.72
Japan	11.83	35.61	-0.25	5.07 <sup>c</sup>	0.86	25.67	2.84
UK	11.04	53.85	-0.17	6.39 <sup>c</sup>	0.91	40.88	2.23
USA	11.13	48.52	-0.16	4.31 <sup>b</sup>	0.81	18.54	2.17

Note: N=5.

Source: Computed from Annexure Tables – A1 to A5.

per cent to 52 per cent. Thus, it can be interpreted that in 2005, a unit decrease in the mean tariff rate was capable of increasing the mean GDP by 0.23 units.

Model specified in equation-2 is now estimated for every country separately, taking all the five time-periods together. And for this purpose the same equation is to be re-specified to make it country-specific. The model is:

$$\log GDP_i = \sum_{t=1}^5 \alpha + \sum_{t=1}^5 \beta TAR_i + U_i(3)$$

Thus, for every country 'i' five time periods' values for each variable are pooled together and the model is estimated separately for each country. The estimated results are given in Table 3. Results indicate that out of the 30 selected countries, the result is significant in 19 countries, among which only in two countries, viz., Malawi and Colombia, the explanatory variable has come out with a positive sign. These results when taken with the basic data (Annexure Table A1 to A5) indicate that in those countries where the tariff rates have fallen consistently and considerably, income level too has increased commensurately. Thus, in those countries, the 't' value is significant at 1 per cent level. The case of China, Sri Lanka, Brazil, South Korea and Italy apart from the HIG countries can be cited as examples. Moreover, among the 11 countries in which the result is not significant (at 10 per cent level), apart from Mexico, in all other countries, the explanatory variable has attained the anticipated sign. This clearly suggests that there is indeed an inverse link between international competitiveness and economic growth. This is further reinforced by the fact that the magnitude of the slope co-efficient is considerably higher in the HIG countries than in others and so also the co-efficient of determination.



## **Conclusion**

Globalization invariably and inextricably linked with the process of falling tariff rates among the countries. This provides a level-playing field for better competitiveness in both intra-country and inter-country conditions. This analysis shows that over the years, income levels of most of the countries have gone up, though in varying degree. Along with the rise in income levels, sectoral shares in GDP and employment have also undergone structural shifts. Structural shifts in both income and employment towards industrial sector have taken place prominently in those countries where the tariff rates have fallen consistently and considerably. Moreover, econometric results show that over the years, the relevance of competitiveness which is proxied by tariff rate, in determining the GDP levels has improved. Country-specific results indicate that tariff rates play a greater openness in the latter group of countries, especially in their imports, since imports play a more vital role than exports in economic growth. Also, there is a positive and direct link between higher imports and higher exports, as those countries which import more also export more and in such countries income levels have also increased considerably.

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