# IMPACT OF TARIFF REDUCTION ON TRADE BETWEEN INDIA AND USA[1]

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## *PURPOSE*

*THE purpose of the study was to understand the trade relationship between India and USA, and to investigate how tariff can impact trade, and to what extent.*

***Design/Methodology/Approach:*** *The first section of this paper introduces us with the issue, followed by literature survey in the second section, and composition of India's trade with US in the third section. The fourth section of the paper analyses the impact of Indian tariffs on US trade, while the fifth section analyses the tariff structure of both India and USA. In the final section the paper gives us concluding remarks. A detailed methodology has been developed by conducting desk base research. A multiple regression model has also been developed to estimate the impact of US tariff on Indian trade with USA. We have estimated the model using Ordinary Least square method. For the 8 different products 8 independent regression models have been made.*

***Findings:*** *The empirical findings revealed that the top exporting products of India are responsive to tariff incidence. Significant influence of tariff vis-à-vis price component for garment and diamond products was found. The empirical result shows that Indian products are largely dominated by relative price changes. It is found that tariff has a positive impact for five out of eight products were analysed. These are Organic compounds (294200), medicaments (300490), T-shirts (610910), women's garments (620630), diamonds (710239) and pipe lines (730511). Among them, the tariff effect is significant for only T-shirts, women garments and diamond product groups.*

***Research Limitations/Implications:*** *The limited availability of time series data has been one of the major limitations of the study. The tariff data for all the selected top 10 products were also not available. As a result regression analyses was conducted for 8 products only.*

***Practical Implications:*** *The paper is implemented in the current Indo-US trade scenario. The paper can be a very useful material to assess the impact of US tariff on US trade with India and vice-versa. Scholars can use the paper for further research in the same area.*

***Originality/Value:*** *The paper is 100 percent original form. Proper references have been cited where other research papers were used in conducting research.*


***Key Words: India, USA, Trade, Tariff.***

## Introduction

Tariff has a very important role in increasing or decreasing trade between countries. Tariffs are also a convenient way to increase government revenues if the changes are within the context of a country's regional and multilateral obligations. With establishment of World Trade Organisation (hereafter WTO) a new era of trade emerged, where the significance of tariff has become more and more vital. With the liberalisation of trade many countries have brought huge reduction in their tariff levels. With the introduction of New Economic Policy and opening up the economy, India has also followed the same. The policy initiated to bring the reform consists of reducing peak rates, removing exemptions and simplifying the system. The peak customs duty rate which was around 150% in 1991 has come down to 30% in 2002 (Virmani, 2002). India had removed all quantitative restrictions maintained earlier on account of balance of payment reasons in a progressive manner, culminating in the completion of this process in March, 2001. The remaining restrictions maintained on account of security, health, safety and public morals etc. have also been reviewed and restrictions

on more than 150 tariff lines at the 8-digit level have been removed subsequent to March 2001. All these actions have their impact on trade. However, these impacts may be positive or negative for different industries and different products. In the current paper, the impact of these reduction on the bilateral trade between India and United States of America (hereafter USA) has been analysed.

## Review of Literature

Many academicians have studied the different aspects of tariff reduction on the trade. Both positive and negative impact on the trade has been explored by these studies. Some of the major contributors to this particular literature are Bhagwati and Srinivasan (1975), Wadhwa (1998), Srinivasan (1998),Virmani (1991), Joshi and Little (1994), Krishnamurthy and Pandit (1995) and Roy (2002). Goldar et.al. (2010) argued that the tariff reduction in agricultural products will lead to an increase in India's imports of agricultural products by about one percent.Saqib and Taneja (2005) found that even after facing a number of tariff and non-tariff barriers Indian export to Sri Lanka and ASEAN countries have increased significantly. Golder (2005) studied how the Indian industry was impacted by India's commitments on tariff and quantitative restriction under WTO. The study argued that the tariff reform had a significant impact on Indian industry. However, the study also reveals that, these effects cannot be attributed to India's commitments. Hayakawa (2011) found the interdependent relationship between finished goods and intermediate goods through tariff. The study also finds that exports of finished machinery products are negatively associated with not only the importers tariff rates but also the exporter's tariff rates on machinery parts. Aggarwal (2004), argues that increase in India's exports would be mainly due to the competitive factor. The market effect of tariff reduction is likely to be very small for most items that display significant price elasticity in India's case.

## Composition of Trade between India and USA

There has been a significant change in the composition of India's trade over the years. Indian exports to the USA have been rising constantly. It is mainly on account of significant increase in the exports of gems & jewellery, textiles and readymade garments, machinery, carpets, footwear and leather products, dyes, iron and steel products, chemicals, edible fruits and nuts, and spices, coffee and tea.

Textiles and clothing, cut and polished non-industrial diamonds, carpets, shrimps and prawns, footwear, leather goods and cashew nuts together account for about 75 percent of total Indian exports to USA[2]. There has also been a change in the composition of Indian imports from USA. In the recent years, India has become self-sufficient and has stopped or reduced importing many of the food items from USA. The major items imported from USA currently are machinery including project items, fertilizers, aircraft and aeronautical equipment, and organic chemicals.

The top merchandise traded goods to USA are diamonds, textiles, carpets, pharmaceuticals products, mineral products, fertilizers, iron and steel, chemicals, electronic goods, aircraft, etc. (in terms of value).

Table 1 shows the total merchandise trade of India and USA and world. The analysis is done for both pre WTO period and post WTO period. The table shows that India's total trade with USA was 2435 Million US $ in 1980 which increased to 7904 Million US $ in 1994. In the year 1980 the share of USA in India's total trade was 11 percent which jumped to 14 percent in 1994. In the same time the cumulative growth rate of India's trade with world was 7 percent while it was higher in case of USA to 9 percent. With the establishment of WTO and liberalization of India's economy India's external sector got a momentum; during post WTO period i.e., from 1995 onwards India's trade with both USA and world has increased. However, USA's share in India's total trade has decreased from 14 percent to 8 percent. But it has not affected its absolute value. CAGR during this period i.e. in post WTO period, in case of USA was 10 Percent and 14 percent for world as a whole.

**Table 1: India's Total Merchandise Trade with World and USA and its Share**

*(In 000' US $)*

| Year | Total Trade USA | Total Merchandise Trade World | Share of USA in India's Total Trade |
|---|---|---|---|
| 1980 | 2435751 | 21329323 | 11 |
| 1981 | 2327797 | 22323852 | 10 |
| 1982 | 777391 | 8468311 | 9 |
| 1983 | 3193955 | 24709072 | 13 |
| 1984 | 2908809 | 24238898 | 12 |
| 1985 | 3327607 | 25173192 | 13 |
| 1986 | 3289274 | 25473380 | 13 |
| 1987 | 3787273 | 29193746 | 13 |
| 1988 | 4766347 | 33166052 | 14 |
| 1989 | 5360378 | 38729179 | 14 |
| 1990 | 5182141 | 41657940 | 12 |
| 1991 | 4813419 | 37382520 | 13 |
| 1992 | 6247572 | 45131733 | 14 |
| 1993 | 6670960 | 45510525 | 15 |
| 1994 | 7904583 | 54963919 | 14 |
| **Average Trade** | **4199550** | **31830109** | |
| **CAGR** | **9** | **7** | |
| | | **Post WTO** | |
| 1995 | 9331446 | 68241984 | 14 |
| 1996 | 10169009 | 72516946 | 14 |
| 1997 | 10433608 | 76150445 | 14 |
| 1998 | 10827451 | 75534521 | 14 |
| 1999 | 11942048 | 86385398 | 14 |
| 2000 | 12172199 | 95298348 | 13 |
| 2001 | 11630787 | 94549595 | 12 |
| 2002 | 14215132 | 107551427 | 13 |
| 2003 | 16251768 | 131791183 | 12 |
| 2004 | 19048693 | 174885330 | 11 |
| 2005 | 24849360 | 241214303 | 10 |
| 2006 | 30026930 | 299413047 | 10 |
| 2007 | 34339700 | 364543347 | 9 |
| 2008 | 45894254 | 497573004 | 9 |
| 2009 | 35126623 | 443166589 | 8 |
| **Average Trade** | **19750601** | **188587698** | |
| **CAGR** | **10** | **14** | |

***Source: UN Comtrade Database, SITC Rev. 2.***

## Impact of Tariff on India's Export to USA: An Econometric Analysis

In this section the role of tariff on the export performance of Indian products to USA has been examined. The period of study is between 1991 to 2010. The selection of the time period covers the period of tariff reduction in conjunction with structural adjustment programs in India. The period of study is also guided by the availability of tariff data.

We specify the demand for Indian export to US as a function of US demand for particular product and the relative price. Specifically, the export demand function is specified as follows:

$$IEX_{it} = f(Y_{us,t}, RP_{it}) \qquad ----(1)$$

Here $IEX_{it}$ denotes Indian export of product i in year t. $Y_{ust}$ is US income for product i in year t, $RP_{it}$ is the relative (adjusted[3]) price variable for Indian exports. In defining RP variable, we follow Aggarwal (2004) has been followed. She defines it as adjusted relative prices in sector i in year t. The adjusted relative price is calculated as follows:

$$\frac{\left(\frac{P_{it,US}}{P_{it,ind}}\right)ER_t}{100 + TA_{it}} \qquad -----(2)$$

Here, $P_{it,us}$ is the price of product i in year t for US, $P_{itind}$ is the price of product i in year t for India, $ER$ is the average exchange rate of India to US dollar in year t, TA is the tariff rate for product i in year t. Therefore, the (adjusted) relative price is the ratio of the US price to the Indian prices adjusted for the exchange rate and tariff rate.

The equation (1) shows that Indian export demand is a function of US income and relative price effect. In this model, US income is measured as the world export of product i in year t to US. It is expected that an increase in US demand for product i, increases the world export for product i. Therefore we took world export as a proxy for US demands for product i.
Normalizing equation (1) by $Y_{ust}$ we have,

$$\frac{IEX_{it}}{Y_{us,t}} = [\![f(RP]\!]_{it}) \qquad ------ (3)$$

The above model is based on the standard conventional export function. The trade theory asserts that export demand function is determined by foreign country purchasing power (level effect) and relative price changes (price effect). We have extended the model by incorporating the exchange rate and tariff rate variables, both of which influence the relative price level between two countries. Thus, the model assumes that Indian exports are a function of the US income and the adjusted relative prices. It is expected that the sign of relative price to be positive. In other words as the price of US goods relative to Indian exports increase, the demand for India's exports would also increase. If the tariff rates increase, the relative prices would decline, reducing the demand for India's exports, *ceteris paribus*.

$$\log\left(\frac{IEX_{it}}{Y_{us,t}}\right) = \alpha_1 + \alpha_2 \log RP_{it} + \varepsilon_{it} \qquad ----(4)$$

For the empirical analysis, the regression equation is given below,

The variables are described below:

$IEX_{it}$ = is the Indian export (Million US $) for product i in year t,

$Y_{ust}$ = is the US demand for product i in year t. It is proxied by world export of product i in year t.

$RP_{it}$ = is the relative (adjusted) price in sector i in year t

$\varepsilon_{it}$ = error term

i = for product (i=1, 2… n)

t = time (1991-2010)

The empirical analysis is restricted to following variables; Organic compounds (294200), medicaments (300490), T-shirts (610910), women's garments (620630), furnishing articles (630492), diamonds (710239), pipe lines (730511) and Electric Products (850230). The export data for India, US and the world economy is collected from UN Comtrade. The selection of variables is based on HS 1988/92 classification. The real exchange rate of India is available from Handbook of Statistics on Indian Economy, Reserve Bank of India. The tariff data is available from UN TRAINS, accessed through WITS. We have estimated the model using Ordinary Least square method. For the 8 different products we have made 8 independent regression models[4]. These 8 products contribute more than 80 percent of India's exports to USA. Since the model is based on theoretical premises, the relevant test is one tailed. The result is given in Table 2.

**Table 2: OLS Estimation Result, Dependent Variable $\frac{IEX_{it}}{Y_{us,t}}$**

| Product Code (HS) | Relative Price | Constant | $R^2$ | DW |
|---|---|---|---|---|
| 294200 | 0.03(0.03) | -1.2 (0.27) | 0.61 | 1.69 |
| 300490 | 0.39(0.24) | -5.88 (0.62) | 0.22 | 0.48 |
| 610910 | 0.04***(0.01) | -3.38(0.04) | 0.88 | 1.59 |
| 620630 | 0.06***(0.00) | -1.03 (0.06) | 0.52 | 2.32 |
| 630492 | -0.01(0.00) | -0.12 (0.01) | 0.23 | 0.79 |
| 710239 | 0.37 **(0.12) | -2.80 (0.40) | 0.54 | 1.41 |
| 730511 | 0.01(0.03) | -6.14 (0.27) | 0.69 | 2.46 |
| 850230 | -0.08(0.10) | -6.49 (1.25) | 0.17 | 1.05 |

***Note: Parentheses are standard error, Description of the HS codes are given earlier section of the paper.***

The result shows that Indian products are largely dominated by relative price changes. It is found that tariff has a positive impact for five out of eight products analysed. These are Organic compounds (294200), medicaments (300490), T-shirts (610910), women's garments (620630), diamonds (710239) and pipe lines (730511). Among them, the tariff effect is significant for only T-shirts, women garments and diamond product groups. This means that an increase in tariff for these products will reduce the price of US good relative to Indian exports. It will reduce the US demand for Indian products resulting in a fall in export of these products from India to US, *ceteris paribus.* This means that exchange rate devaluation will be effective only if it is accompanied by comprehensive tariff liberalization. This is not surprising as these products are relatively price elastic and exchange

rate movements have significant effect on their long term export trend. It was found that furnishing articles and electric products are price inelastic. These products may be responsive to non-price variables such as technology, skill intensity etc. Since single equation analysis was done, these effects are not covered.

## Tariff Structure of India and USA

### Sector Level Structure

This section of the paper focuses on current tariff structure of both India and USA. Table 3 gives detail about the structure of tariff prevailing in USA and India. The tariff data of USA was collected to analyse the tariff level faced by Indian export in USA and Indian tariff data to assess to what extent USA export are facing tariff in India.

Table 3 shows that tariff structure of India and USA in two different time periods i.e. in 1990 (pre WTO) and in 2009 (Post WTO). The selection of 2009 is entirely influenced latest data availability. The statistic shows the tariff structure of agricultural as well as industrial products. In case of India the data revivals that, simple average tariff which was 82.87 in 1990 for agricultural products has gone down to only 31.85 in 2009, while for industrial product the same tariff has come down from 81.69 to only 9.43 in 2009 in the same time period. However, reduction of tariff by India for agricultural products is lower them that of it industrial products. It is because India is a major agricultural producer and to provide safe guard to its farmer and other agricultural producers in the domestic market it has to take proper action in this regard.

In case of USA reverse data is visible. US tariff for agricultural products which was only 4.67 in 1990 has increased to 7.22 in 2009. For Industrial products, USA use to impose 5.67 tariffs in 1990, which has decreased to 3.34 in 2009. It is clear from the statistics that USA has been maintaining low tariff revel for a long time.

**Table 3: Comparative Tariff Structure of India and USA**

| Importer | Product | Year | Tariff Average | Simple Average | Weighted Deviation | Standard No. of Total | No. of Domestic Peaks | No. of International Peaks |
|---|---|---|---|---|---|---|---|---|
| India | Agricultural Products | 1990 | 82.87 | 50.27 | 46.26 | 662 | 10 | 598 |
| India | Industrial Products | 1990 | 81.69 | 49.55 | 38.27 | 4356 | 87 | 4303 |
| India | Agricultural Products | 2009 | 31.85 | 29.38 | 31 | 1430 | 195 | 1114 |
| India | Industrial Products | 2009 | 9.43 | 7.21 | 7.92 | 9894 | 61 | 241 |
| United States | Agricultural Products | 1990 | 4.67 | 3.92 | 7.59 | 1242 | 49 | 102 |
| United States | Industrial Products | 1990 | 5.67 | 4.51 | 5.9 | 7432 | 240 | 538 |
| United States | Agricultural Products | 2009 | 7.22 | 4.84 | 30.35 | 1792 | 141 | 98 |
| United States | Industrial Products | 2009 | 3.34 | 2.59 | 5.09 | 8657 | 463 | 242 |

***Source: IDB, WITS.***

**Tariff imposed on Major Importing Goods**

The bound tariff and MFN tariff of major importing goods in India has been revealed in Table 4. The table shows that India mainly imports fruit and vegetables, oilseeds, sugar and confectionery and beverages and tobacco under agricultural products category. Under agricultural products, India has imposed highest amount of tariff for beverages and tobacco. The applied MFN tariff for products under this category face tariff as high as 70.8%. This products group is followed by Sugar and confectionary and Dairy products. These two products group face tariff level of 34.4% and 33.7% respectively. Cereals and preparations face tariff level of 32.2 percent of applied tariff.

**Table 4: Tariff Structure of Major Importable in India**

| Product groups | Final bound duties | | | | MFN applied duties | | | Imports | |
|---|---|---|---|---|---|---|---|---|---|
| | AVG | Duty-free | Max | Bind-ing | AVG | Duty-free | Max | Share | Duty-free |
| | in % | | | in % | in % | | | in % | |
| Dairy products | 65.0 | 0 | 150 | 100 | 33.7 | 0 | 60 | 0 | 0 |
| Fruit, vegetables, plants | 99.3 | 0 | 150 | 100 | 30.4 | 0.5 | 100 | 0.9 | 21.7 |
| Cereals & preparations | 115.7 | 0 | 150 | 100 | 32.2 | 10.9 | 150 | 0 | 9 |
| Oilseeds, fats & oils | 166.0 | 0 | 300 | 100 | 18.2 | 17.1 | 100 | 1.3 | 72.9 |
| Sugars and confectionery | 124.7 | 0 | 150 | 100 | 34.4 | 0 | 60 | 0.1 | 0 |
| Beverages & tobacco | 120.5 | 0 | 150 | 100 | 70.8 | 0 | 150 | 0.1 | 0 |
| Cotton | 110.0 | 0 | 150 | 100 | 12.0 | 20 | 30 | 0.1 | 0 |
| Other agricultural products | 105.6 | 0 | 150 | 100 | 21.7 | 11.2 | 70 | 0.3 | 9.9 |
| Minerals & metals | 38.3 | 0.4 | 55 | 60.6 | 7.5 | 0.3 | 10 | 33.3 | 17.2 |
| Petroleum | - | - | - | 0 | 3.8 | 22.2 | 5 | 29.1 | 0 |
| Chemicals | 39.6 | 0.1 | 100 | 89.3 | 7.9 | 0.4 | 10 | 7.5 | 2 |
| Wood, paper, etc. | 36.6 | 0 | 40 | 64.6 | 9.1 | 2.8 | 10 | 1.6 | 3.6 |
| Non-electrical machinery | 28.2 | 7 | 40 | 94.5 | 7.3 | 4.5 | 10 | 9.1 | 23.1 |
| Electrical machinery | 27.0 | 26.9 | 40 | 93.7 | 7.2 | 16.7 | 10 | 7.7 | 62.4 |
| Transport equipment | 35.7 | 0 | 40 | 70.7 | 20.7 | 2.1 | 100 | 4.5 | 3.9 |
| Manufactures, n.e.s. | 30.8 | 21.6 | 40 | 42.5 | 8.9 | 5.4 | 10 | 2.6 | 32 |

***Source: WTO, World Tariff Profiles 2010.***

Under non-agricultural products, India charges highest level of tariff under product group of Transport Equipment 20.7% followed by Wood and paper 9.1% and Manufacturing N.E.S 8.9%.

Table 5 analyses the tariff structure of major importable of USA. The data reveals that in agricultural sector, dairy product group faces highest level of applied tariff of 16.2%. The dairy product has share of 0.1% in the total import of USA. The dairy product is followed by beverages and tobacco (13.5%) and sugar and confectionery (9.1). However, these two products group also enjoy duty free import of 49.7% and 7.2% respectively. It is also noteworthy that 1% of US import consists of beverages and tobacco. Under manufacturing products, clothing faces highest level of tariff in USA market. It is important to mention that India is a major exporter of clothing in US market and is followed by textiles. Under clothing segment, USA provides only 0.8% duty free imports, while it is 12.1% for textile products.

**Table 5: Tariff Structure of Major Importable in USA**

| Product groups | Final bound duties | | | | MFN applied duties | | | Imports | |
|---|---|---|---|---|---|---|---|---|---|
| | AVG | Duty-free | Max | Bind-ing | AVG | Duty-free | Max | Share | Duty-free |
| | in % | | | in % | in % | | | in % | |
| Animal products | 2.6 | 31 | 26 | 100 | 2.5 | 31 | 26 | 0.4 | 25.8 |
| Dairy products | 21.1 | 0.3 | 126 | 100 | 16.2 | 0.2 | 126 | 0.1 | 15.2 |
| Fruit, vegetables, plants | 5.5 | 23.3 | 132 | 100 | 4.9 | 20.1 | 132 | 1 | 24 |
| Coffee, tea | 3.7 | 53.5 | 69 | 100 | 3.6 | 53.3 | 69 | 0.4 | 81.2 |
| Cereals & preparations | 3.7 | 20.8 | 98 | 100 | 4.0 | 20.9 | 98 | 0.5 | 32.5 |
| Oilseeds, fats & oils | 4.7 | 28 | 164 | 100 | 4.2 | 24.3 | 164 | 0.4 | 35.8 |
| Sugars and confectionery | 15.0 | 2.9 | 79 | 100 | 9.1 | 2.1 | 79 | 0.1 | 7.2 |
| Beverages & tobacco | 16.4 | 27.8 | 350 | 100 | 13.5 | 26.8 | 350 | 1 | 49.7 |
| Minerals & metals | 1.7 | 59.9 | 38 | 100 | 1.8 | 60.8 | 38 | 14.6 | 76.7 |
| Chemicals | 2.8 | 40 | 7 | 100 | 2.8 | 40.7 | 7 | 9.6 | 67.3 |
| Wood, paper, etc. | 0.4 | 91.8 | 14 | 100 | 0.5 | 90.2 | 14 | 3.6 | 91.9 |
| Textiles | 7.9 | 16 | 38 | 100 | 8.0 | 15 | 38 | 1.8 | 12.1 |
| Clothing | 11.4 | 3.4 | 32 | 100 | 12.1 | 2.8 | 32 | 3.6 | 0.8 |
| Leather, footwear, etc. | 4.3 | 38.4 | 60 | 100 | 4.0 | 38.9 | 60 | 2.2 | 20 |
| Non-electrical machinery | 1.2 | 66.3 | 10 | 100 | 1.2 | 65 | 10 | 12.6 | 80.4 |
| Electrical machinery | 1.7 | 48.8 | 15 | 100 | 1.7 | 48.4 | 15 | 11.8 | 63.9 |
| Transport equipment | 3.1 | 54.8 | 25 | 100 | 3.0 | 55.7 | 25 | 10.9 | 14.9 |
| Manufactures, n.e.s. | 2.1 | 49.6 | 53 | 100 | 2.6 | 44.4 | 53 | 6.5 | 73.3 |

***Source: WTO, World Tariff Profiles 2010.***

**Tariffs Imposed on Top 10 Importing Goods**

In the Table 6, the tariffs of the top importing products of India from USA have been analyzed. For analysis, two time periods have been considered, one is pre WTO (1990) and other is post WTO (2009). The year 1990 is taken as the base year. The rationale of selecting 2009 is the latest data availability. Both simple and weighted averages are demonstrated in the table. Under WTO

regulations both India and USA has given MFN status to each other. However, no preferential tariffs have been committed by any of these two countries to one another.

**Table 6: Indian Duty on US Export (Indian Import)**

| Product | Product Name | Simple Average | | Weighted Average | |
|---|---|---|---|---|---|
| | | **1990** | **2009** | **1990** | **2009** |
| 271390 | Residues of petroleum oils/oils obt. from bituminous mi. | 40 | 5 | 40 | 5 |
| 271311 | Not calcined | 5 | 5 | 5 | 5 |
| 310530 | Diammoniumhydrogenorthophosphate (diammoniumphos) | 60 | 5 | 60 | 5 |
| 381590 | Other | 70 | 8 | 70 | 8 |
| 710239 | Other | 40 | 10 | 40 | 10 |
| 710812 | Gold (incl. gold plated with platinum), in unwrought forms | 100 | 10 | 100 | 10 |
| 720449 | Other | 100 | 5 | 100 | 5 |
| 880220 | Aeroplanes and other aircraft, of an unladen weigh | 35 | 3 | 35 | 3 |
| 880230 | Aeroplanes and other aircraft, of an unladen weigh | 35 | 3 | 35 | 3 |
| 880330 | Other parts of aeroplanes or helicopters | 35 | 3 | 35 | 3 |

***Source: UN TRAINS.***

From the available statistics in the table, the researcher tried to assess the level up to which the tariff has been reduced after the establishment of WTO. The data demonstrates that for all the major importing commodities India has reduced its tariff level between our reference periods. The Simple Average tariff of (710812) Gold which was as high as 100 percent in 1990 has been reduced to only 10 percent in 2009.

Similarly, Table 7 shows tariffs faced by top Indian exporting goods to USA in 1990 and 2009. Like table 6, it also shows both simple and weighted averages of tariffs. It is noteworthy that for two products; Line pipe of a kind used for oil/gas (730511) and other versions of pharmaceutical products (300490) USA has removed the whole tariff.

**Table 7: US Duty on Indian Export (US Import)**

| Product | Product Name | Simple Average | | Weighted Average | |
|---|---|---|---|---|---|
| | | **1990** | **2009** | **1990** | **2009** |
| 271000 | Petroleum oils and oils obtained from bitu | 6.4 | 7 | 6.4 | 7 |
| 294200 | Other organic compounds. | 10 | 4.64 | 10 | 4.64 |
| 300490 | Other | 3.4 | 0 | 3.4 | 0 |
| 610910 | Of cotton | 21 | 16.5 | 21 | 16.5 |
| 620630 | Of cotton | 9.9 | 9.3 | 9.9 | 9.3 |
| 630492 | Not knitted or crocheted, of cotton | 7.2 | 6.3 | 7.2 | 6.3 |
| 710239 | Other | 0 | 0 | 0 | 0 |
| 711319 | Of other precious metal, whether or not plated or | 6.58 | 5.77 | 6.58 | 5.77 |

| | | | | | |
|---|---|---|---|---|---|
| 730511 | Line pipe of a kind used for oil/gas pipelines, ..welded | 7.6 | 0 | 7.6 | 0 |
| 850230 | Electric generating sets | 4.18 | 3 | 4.18 | 3 |

***Source: UN TRAINS.***

**Tariffs Imposed on Major Trading Partners**

Table 8 and 9 give details about the major trading partners of India and USA. The tables describe the bilateral import values of both USA and India with its major partners. The tariff level; both simple and weighted (average) faced by these sources, both at 2 digit HS and 6 digit HS level are analysed in the table. Moreover, import partners for India as well as USA are identified for agricultural and non-agricultural products. The data shows that EU was the top market for Indian agricultural products in 2008, while USA stood second position in the same year. More interestingly in the same time point both EU and USA captured the similar position for non-agricultural export of India. India exported 2.9 million US $ of agricultural goods to EU in 2008, while in the same time period non-agricultural export of India to EU was 38 billion US$.

**Table 8: Tariff Structure of India Faced by Major Trading Partners**

| **Major markets** | **Bilateral imports (in mil US $)** | **Diversi-fication** | | **MFN AVG** | | **Pref.** | **Duty-free imports** | |
|---|---|---|---|---|---|---|---|---|
| | | **95% trade no. of** | | **Traded TL** | | **Margin** | **TL** | **Value** |
| | | **HS 2-digit** | **HS 6-digit** | **Simple** | **Weigh-ted** | **Weigh-ted** | **in %** | **in %** |
| **Agricultural products** | | | | | | | | |
| 1. European Union 60.0 | 20082,947 | 24 | 106 | 13.8 | 6 | 2 | 25.5 | |
| 2. United States 81.2 | 20081,643 | 23 | 82 | 6.3 | 1.7 | 0.7 | 72.8 | |
| 3. China | 20081,515 | 8 | 13 | 15.5 | 29.4 | 22.6 | 25.0 | 9.3 |
| 4. Malaysia | 20081,000 | 15 | 33 | 19.4 | 5.8 | 0 | 60.2 | 95.8 |
| 5. United Arab Emirates 69.3 | 2007 | 969 | 21 | 82 | 6 | 2.8 | 0 | 23.1 |
| **Non-agricultural products** | | | | | | | | |
| 1. European Union 64.3 | 200838,326 | 65 | 1,190 | 4 | 4.5 | 2 | 66.5 | |
| 2. United States 69.2 | 200823,880 | 61 | 722 | 3.8 | 3.7 | 0.6 | 73.9 | |
| 3. China | 200818,720 | 26 | 85 | 9 | 1.2 | 0.5 | 10.4 | 83.7 |
| 4. United Arab Emirates 33.2 | 200711,278 | 58 | 563 | 4.7 | 3.3 | 0 | 5.8 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5. Hong Kong, China 100.0 | 2008 | 8,472 | 13 | 31 | 0 | 0 | 0 | 100.0 | |

***Source: WTO, World Tariff Profiles 2010.***

The data in the Table 9 shows Japan as major market for US agricultural goods. Japan imported agricultural goods worth of 18 billion US $ in 2008. For non-agricultural export of USA, EU stands top with import value of more than 205 billion US $ in the same year. After Japan, Mexico marks second in US agricultural export and Canada for non-agricultural products.

**Table 9: Tariff Structure of USA Faced by Trading Major Partners**

| **Major markets** | **Bilateral imports (in mil US $)** | | **Diversi-fication** | | **MFN AVG** | | **Pref.** | **Duty-free imports** | |
|---|---|---|---|---|---|---|---|---|---|
| | | | **95% trade no. of** | | **Traded TL** | | **Margin** | **TL** | **Value** |
| | | | **HS 2-digit** | **HS 6-digit** | **Simple** | **Weigh-ted** | **Weigh-ted** | **in %** | **in %** |
| **Agricultural products** | | | | | | | | | |
| 1. Japan | 2008 | 18,918 | 25 | 88 | 20.5 | 10.7 | 0 | 23.5 | 67.2 |
| 2. Mexico | 2008 | 17,631 | 27 | 164 | 25.2 | 57.6 | 57.6 | 100.0 | 100.0 |
| 3. Canada | 2008 | 15,976 | 29 | 282 | 15.7 | 4.5 | 4.4 | 94.6 | 100.0 |
| 4. China | 2008 | 13,894 | 12 | 24 | 15.3 | 7.6 | 4.1 | 6.4 | 0.7 |
| 5. European Union | 2008 | 10,884 | 30 | 169 | 17.4 | 4.8 | 0 | 15.4 | 51.4 |
| **Non-agricultural products** | | | | | | | | | |
| 1. European Union | 2008 | 205,137 | 59 | 1,513 | 3.9 | 1.4 | 0 | 30.4 | 66.5 |
| 2. Canada | 2008 | 192,651 | 59 | 1,418 | 3.8 | 3 | 3 | 100.0 | 100.0 |
| 3. Mexico | 2008 | 133,296 | 62 | 1,482 | 10.2 | 9 | 9 | 100.0 | 100.0 |
| 4. China | 2008 | 67,421 | 51 | 938 | 8.7 | 4.6 | 0 | 10.3 | 37.1 |
| 5. Japan | 2008 | 57,106 | 57 | 794 | 2.9 | 0.7 | 0 | 54.9 | 83.8 |

***Source: WTO, World Tariff Profiles 2010.***

Indian agricultural products face 13.8% of simple average MFN duty in European market and only 4% of MFN duty for non-agricultural products. 60 percent of Indian agricultural products enter EU market, without paying any duty and it is 64.3% for non-agricultural products.

Japan charges 20.5% of simple average MFN for US export of agricultural products. 67.2% of US agricultural export also enjoys duty free benefit in Japanese market. In case of non-agricultural products EU charges only 3.9% of simple MFN to US export. In addition to that EU also allows 66.5% of duty free import from USA.

## Conclusion

This paper discusses about the effect of tariff incidence on Indian exports to USA. In the introductory section the researcher has explained in detail regarding the nature of protective measures like tariff and non-tariff barriers. It is seen that there is a general preference for tariff to non-tariff barriers because of ease of implementation, revenue benefits and reasonable measurement of its impact on economic variables.

The researcher has selected some of the top exporting items of India to USA for the period 1991-2010. The hypothesis was that Indian exports to US is responsive to USA income level and relative price component. The tariff rate faced by Indian exporters to USA was included in the relative price variable. Researcher denotes it as 'adjusted' price effect. The empirical findings revealed that the top exporting products of India are responsive to tariff incidence. Significant influence of tariff vis-à-vis price component for garment and diamond products has been found. Therefore, a significant change in tariff rate can alter the relative price of Indian exporters and making it vulnerable to losing market share. On the policy side, it can be seen that a sustained growth in Indian export requires a well maintained exchange rate regime and tariff concession from the USA market. Apart from these measures, a strategy of systematic diversification of export basket can help in reducing risk associated with unexpected price shocks.

## References

Aggarwal, Aradhna (2004), "Impact of Tariff Reduction on Exports: A Quantitative Assessment of Indian Exports to the US", Working Paper No. 120, New Delhi, *ICRIER*.

Bhagwati, J. and Srinivasan, T.N. (1975), "Foreign Trade Regimes and Economic Development: India", New York, Columbia University Press (for the NBER).

Goldar, Bishwanath (2005), "Impact on India of Tariff and Quantitative Restrictions under WTO", Working Paper No. 172, New Delhi, *ICRIER*.

Goldar, Bishwanath, Pratap, Devender, and Parida, Yashobanta (2010), "Impact of Tariff Reduction According to Doha Modalities on India's Trade of Agriculture Products", New Delhi, *Institute of Economic Growth*.

Hayakwa, Kazunbo (2011), "Bilateral Tariff Rates in International Trade: Finished Goods versus Intermediate Goods", IDE Discussion Paper No. 304, JETRO.

Joshi, V. and Little, I.M.D. (1994), "India: Macroeconomics and Political Economy", 1964-91, New Delhi, Oxford University Press.

Krishnamurthy, K. and Pandit, V. (1995), "India's Trade Flows: Alternative Policy Scenerios:1995-2000", Working Paper No. 32, Delhi, *Centre for Development Economics*, Delhi School of Economics.

Roy, S.S. (2002), "Determinants of India's Exports A Simultaneous Error Correction Approach", Discussion Paper 37, New Delhi, *Research and Information System*.

Saqib, Mohammed and Taneja, Nisha (2005), "Non-Tariff Barriers and India's Exports: The Case of ASEAN and Sri Lanka", Working Paper No. 165, New Delhi, *ICRIER*.

Srinavasan, T.N. (1998), "India's Export Performance: A Comparative Analysis" in Ahluwalia, I.J. and Little, I.M.D. (eds), *India's Economic Reforms and Development: Essays for Manmohan Singh*, New Delhi, Oxford University Press.

Virmani, Arvind (1991), "Demand and Supply Factors in India's Trade", *Economic and Political Weekly*, pp.309-314.

Virmani, Arvind (2002), "Custom Tariff of India", *Reported Submitted to Ministry of Finance*, Government of India.

Wadhwa, C.D. (1998), "Some Aspects of India's Export Policy and Performance" in Lucas, R. and Papanek, G. (eds), *The Indian Economy*, New Delhi, Oxford University Press.

## Notes

1 The views expressed in the paper are authors personal and does not necessarily reflect the views of the institute she belongs. The author is thankful to Indian Institute of Foreign Trade, New Delhi, library for data support.

2 Calculations based on WITS data, SITC revision 2.

3 Adjusted for tariff effect.

4 Initially the researcher tried to analyse top ten exporting products of India to USA which contributes around 80% of total export. But due to unavailability of time series data two products had to be dropped.