FISCAL IMPACTS OF TRADE LIBERALIZATION IN PAKISTAN - AN APPLICATION OF SMART MODEL

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ABSTRACT

Many underdeveloped countries have experienced trade liberalization under the umbrella of international organizations in the past years. However, diverse economies have different experiences of trade liberalization. To analyze the experience of Pakistan trade liberalization, a Software for Market Analysis and Restriction (SMART) model, proposed by the United Nations Conference on Trade and Development (UNCTAD) and the World Bank is utilized for the data from 1995 to 2013. Pakistan trade liberalization has increased the overall trade and welfare of consumers but has reduced the international trade significantly. Trade liberalization policies also have significantly affected international trade tax revenue. Therefore, policymakers should follow the impacts of the policies in both long and short run.

Keywords: Developing Economies, International Trade, Trade liberalization, Trade, Welfare.

INTRODUCTION

The process of trade liberalization started after the second world war when different trade agreements were signed among different nations. It is believed that liberalization of trade has its own benefits and costs. Different levels of international taxes from developed and developing countries is one of the main hitches when it comes to liberalizing trade process. General Agreement on Trade and Tariff (GATT) has put efforts to overcome different types of trade barriers in the world. World Bank and IMF started Poverty Reduction Strategy Papers (PRSP) program and Structural Adjustment Program (SAP) in late 1980's, for decreasing the trade restrictions among developing and developed countries. GATT was replaced by World Trade Organization (WTO) in 1985, to continue to liberalize international trade for poverty reduction and income equality around the world.

There are some internal and external costs of trade liberalization

attached along with its benefits. The loss of tariff revenues due to trade liberalization is one of the critical problems of developing economies as they have less domestic sources for revenue collection. The empirics reveal that around 10 to 20 percent of revenues of the developing countries depend upon tariff collection (Yasmin & Jehan, 2006). Trade liberalization tends to increase the prices of domestic products and lower the prices of foreign products (Prichett & Sethi, 1994).

Pakistan has reduced its average tariff to 45 percent in 1996-97, from a stunning 225 percent in 1990-91. In 2013-14 this tariff was further reduced to only 25 percent (MoF, 2014). This study presents the relationship of trade liberalization and fiscal balance in case of Pakistan over the period of 1995 to 2013.

A partial equilibrium SMART model and static methods have been used for empirical analysis of this study. The World Bank and United Nation Conference on Trade and Development (UNCTAD) have developed the Software for Market Analysis and Restriction (SMART). Following the present socio-economic and political scenario, there are some fiscal implications of trade openness suggested in case of Pakistan. Moreover, this study gives a proper understanding of the structural relationship between revenue collection and trade liberalization of Pakistan economy.

LITERATURE REVIEW

In the beginning of trade liberalization, under the instructions of world trade organization (WTO), many developing nations were attracted to adopt this process as they considered it an easy step towards industrialization and a platform to compete with the developed nations. Although in the first stage, trade liberalization provide the developing countries a number of benefits; but the fiscal implication of trade openness was entirely ignored in this concern. This study provides in-depth insight on the fiscal implications of trade liberalization in the economy. In literature, some studies related to Pakistan's economy have however highlighted the some issues related to trade liberalization and its impacts on the economy. Further, studies have also been conducted to highlight the issues of revenue losses and the expected budget deficit problems, but no study has presented a detailed analysis or explicitly touched the policy concerns and recovery of the revenue losses borne by the government, because of the liberalizing process.

In previous literature, a staff paper of IMF (2001), has examined the relationship of tax structure and trade liberalization in case of developing

countries. The study mentioned that liberalization of trade has an insignificant relationship with tax structure of developing nations. Trade liberalization through low tariff rate changed the composition of taxes in developing countries, and these countries implemented more extensive amount of domestic taxes. In another study, Kassim (2015), argued that openness of trade is positively linked to domestic tax revenues and negatively related to tariff tax collection. Moreover, a rise in urbanization increase domestic tax collections, but low domestic tax is attached to a higher inflation rate. Ebeke, Mansour, and Rota Graziosi (2016), also revealed that, trade liberalization due to its evolving role, has been at the center of economies in recent years. Against government finances of emerging and developing countries, it acts as a tool to develop alternative sources of revenue. The study thus proclaims that more tax revenue accompanies more trade liberalization. The GDP growth rate, the share of agriculture over GDP, official exchange rate, urbanization, and democracy are all enlisted variables for statistically significant influence on tax revenue. Therefore, the study suggests a comprehensive macroeconomic framework is necessary for enhancing government revenues through taxes under the regime of trade liberalization. Cagé and Gadenne (2012), analyzed the domestic fiscal loss due to trade liberalization by using data from 103 developing nations from 1945 to 2006. Trade liberalization leads to lower tax revenue. However, revenue can be increased from trade openness by investing in tax capacity, because countries which are trapped in high tax capacity have experienced positive effect of trade openness on tax revenue. Glenday and Shukla (2006) in an IMF paper, examined that many developing nations faced difficulties in revenue collection domestically in the presence of trade liberalization, but on the other hand, the case is entirely different for developed nations.

Previous literature has different case studies on the subject and share variable results of these economies. Epaphra (2015), in his case study of Tanzania, highlighted that duty on import as a share of GDP has a positive relationship with tariff rates. The estimated results show that decreasing the rate of tariff reduces the number of government revenues. The estimates also suggested that removing barriers on imports increases the share of import in GDP, which further increases the total revenue of imports as a share of GDP. Being a developing nation, for maintaining fiscal stability, Tanzania should try to change its domestic tax structure and collect more taxes as revenues instead of rising tariffs and other barriers to trade. Castro and Camarillo (2014), analyzed OECD

countries regarding the impact of liberalization of trade on the domestic structure of taxes. The study used different methods of trade openness and found that civil liberalities, industrial growth and GDP per capita have a positive relationship with tax revenues, but physical capital, foreign direct investment, and agricultural growth have a negative relationship with tax revenues. By using time series data, Basirat, Aboodi, and Ahangari (2014), studied the case of Iran. Findings show that the exchange rate, imports, value added by agriculture, and the industry sector had a significant effect on tax collection during 1974-2011. Velaj and Prendi (2014), provided the evidence on factors that determine taxes in Albania during 1993-2013. Findings demonstrate that inflation, GDP, and imports increase tax collection. The coefficient of GDP explains that with 1 percent rise in GDP, the taxes grow by 0.62%, while unemployment has a negative effect on tax revenue. Further Karagöz (2013), discussed the case of Turkey. A time series data from 1970 to 2010 was used for examining the determinants of tax revenue. Results show that variables that significantly affect tax revenue include agricultural and industrial sector share, monetization, foreign debt, and urbanization. Agriculture share has an adverse effect while trade openness was found to be an insignificant variable among all variables. Ghatak (1995), also conducted a study on Turkey and used the data from 1950 to 1990. The results of the study show a long run association among physical capital, human capital, trade liberalization index and real per capita GDP in case of Turkey. Ahmed (2000), used data from 1974 to 1996 in case of Bangladesh. The results reveal that there existed endogenous growth, theory presented by Lucas (1988), and observed a positive relationship between industrial growth and trade liberalization in case of Bangladesh over the selected period.

In case of Pakistan, Shahbaz, Loganathan, Mujahid, Ali, and Nawaz (2016), analyzed the trade openness effects on the tax collection and consumer prices. The study analyzed the data of variables including imports, exports, tax revenue and consumer prices before and after trade liberalization. The results reveal that the negative impacts on these variables are not only the cause of trade openness but also due to other country's internal problems. The problems include energy crises which affect the total production in a country profoundly, the political instability and lack of internal security which lowers the foreign direct investment (FDI). Jaffri, Tabassum, and Asjed (2015), analyzed the empirical association between tax revenue and trade liberalization in Pakistan for the period of 1982-2013. Estimation results based on ARDL model showed that there existed a positive association between total tax revenue and trade liberalization in Pakistan over this study period. Sound and stable trade policy along with favorable

environment are needed to promote import of raw material, capital and intermediate goods, which enhances trade in the country leading to enhancement of tax collection. Policy implications based on empirical evidence of the study proves that government should take steps to reduce the trade restrictions in order to enhance trade, so that maximum gains in tax revenue could be achieved.

Mahmood and Chaudhary (2013), analyzed the effect of FDI on tax collection in Pakistan by using data from 1972 to 2010. Findings show that FDI and GDP per person have a positive effect on tax revenue. Zaman, Khan, and Ahmed (2012) have empirically investigated determinants of trade and aggregate tax revenue in Pakistan for the period 1975 to 2010, and observed that GDP, population growth, trade openness and urbanization significantly affect total taxes. Exchange rate, GDP, population, and urbanization are significant determinants of trade taxes. Mushtaq, Bakhsh, and Hassan (2012), examined the effects of different factors on tariff collections and domestic tax collection in Pakistan. Results revealed that the rate of exchange and growth of population had a negative relationship with domestic tax collection, whereas liberalization of trade and trade as a percent to GDP had a positive relationship with domestic tax collection. The results also discovered that urbanization had a positive and significant relationship with domestic tax collection. So, it is ascertained that the combination of fiscal and monetary policies would help in getting the potential results of trade liberalization. Chaudhry and Munir (2010), investigated the factors responsible for low domestic tax collection in case of Pakistan from 1973 to 2009. Results show that social, external, and economic policies affect tax to GDP ratio. External debt, exchange rate, trade openness, foreign aid, broad money, and political environment are the most crucial determinant of tax efforts in case of Pakistan. Remittances, inflation, agriculture, industry, and services share have an insignificant effect on tax revenue. In literature, no study used the SMART model on Pakistan economy to analyze the impact of trade liberalization. This study, therefore, applied the SMART model on Pakistan's economy by using the data from 1995 - 2013.

RESEARCH METHODOLOGY

The partial equilibrium SMART and static methods are used for empirical analysis of this study. Software for Market Analysis and Restriction (SMART) is used which is developed by World Bank and Conference on Trade and Development (UNCTAD). SMART is used to examine the impacts of multilateral and bilateral negotiations on trade creation, tariff reduction and overall revenue collection in case of Pakistan.

Laird and Yeats (1986), established the model of World Integrated Trade Solution (WITS) / Software for Market Analysis and Restriction SMART. They have distributed their model in such a way that it explains revenue welfare effects, trade expansion, and trade volume. SMART can be used under the conditions of ceteris paribus. This methodology gives a comprehensive summary about a reduction in tariff and adjustment of the fiscal structure. The dynamic process, which can impact on other changes is not taken into consideration under SMART methodology (McIntyre, 2005).

This study uses the methodology of SMART due to its immense advantages while examining the tariff impact on a single market following any product line. This methodology can enable the policymakers to examine the impacts of reforms in trade policy under the environment of imperfect substitutes. As compared to homogenous product model, this model can examine the preferences of tariff by avoiding its corner solutions. Although SMART was developed by World Bank and UNCTAD, firstly this methodology was introduced by Laird and Yeats, in 1986.

Software for Market Analysis and Restriction (SMART) is confined by the World Integrating Trade System (WITS). It is based on product trade statistics of Consolidated Tariff Schedules (CTs), Integrated Data Base (IDB), Common Format for Transient Data Exchange (COMTRADE), Trade Analysis Information systems (TRAINs) and other databases which examine the tariff reduction impacts. With the help of SMART, the effects of trade policy changes can be identified, such as tariff reductions in a single market. The primarily targeted variables in this method are welfare effects, tariff collection variations, net trade impacts and trade diversion, and creation. The central six assumptions of SMART are: the elasticity of import substitution is around 1.5; imperfect substitution exists among products of different nations; HS – 6-digit level is taken for measuring import demand elasticities; – the assumptions of Armington are applied; infinite export elasticities exist (which means, perfectly elastic exports are supplied); and in the presence of non-tariff and tariff barriers, price structure is completely changed. One of the main demerits of SMART is that it fails overview interactions and sectoral linkage of the economy and it ignores macro level impacts. Laird and Yeats (1986), concluded that methodology of this model is started with simple export supply and import demand functions and provides partial equilibrium point.

To use this model in this case study, the notations alter for the study

are: The Pakistan's jth function of import demand (M) for ith (all products of Pakistan Custom Tariff (PTC) Code to whom Tariff has been reduced during the particular period as compared to the last year applied rate) good manufactured in kth partner state (k = All trading Partner Annex "A" is expressed in Eq. (1).

$$M\ ijk = F(Y\ j\ ,\ P\ ij\ ,\ P\ ik) \tag{1}$$

The function of k's export supply a country for i commodity is presented as:

$$X\ ijk = F(P\ ikj) \tag{2}$$

(1) and (2) expressions are associated with the following identity:

$$M\ ijk = X\ ikj \tag{3}$$
$$P\ ijk = P\ ikj\ (I +\ t\ ijk) \tag{4}$$

Now it is clear that revenues through exports by k are:

$$R\ ikj = X\ ikj\ .P\ ikj \tag{5}$$

The study develops the SMART model for the case study of Pakistan as importing country, and the j as all trading partners of Pakistan as exporting countries and takes commodities from which the tariff is reduced during the specified year, i.e., financial year.

where
i = All commodities tariff gain has been reduced during the financial year
K = Pakistan as importing country, i.e., domestic country
J = All the trading partners of Pakistan as exporting countries

The results in Table 1 reveal that over the time, there is an increasing trend in net trade effect across product lines. There is an overall increase in trade due to liberalization which is partly due to trade creation and trade diversion. Since 1995-1998, the overall increase in trade amounting to $1.39 billion is due to an average 30% reduction of overall tariff (Liberalized) during the period, and in the next episode it was increased to $ 3.84 billion per month, an average 34% reduction of overall tariff during 1999-2001. A positive trade effect in Pakistan's economy was observed during the full period of 1995-2013 which was US$12.85 billion, but during 2003, 2008, 2010 and 2012 it was recommendable and had significant positive impacts on the economy with amounts as US$ 2 billion in each year.

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Table 1. Impact of Trade Liberalization During 1995-2013 - Using Wits
SMART Model   (In $ 1000)

YEAR	Revenue Effect	Trade Effect	Welfare Effect	LIBERALISED (%)
1995-98	-204,706	1,394,120	89,703	-30.25
1999-01	-2,060,867	3,837,692	1,126,483	-34.06
2002	-64,834	214,486	52,299	-7.67
2003	-441,268	1,550,165	969,590	-5.55
2004	-2,367	140,721	18,458	-7.4
2005	-186,331	67,241	512,475	-9.12
2006	-4,328	9,328	332	-5.17
2007	-16,865	25,912	12,666	-4.42
2008	-629,520	1,512,961	158,696	-7.68
2009	-136,634	512,082	58,644	-3.75
2010	-695,630	1,939,204	141,036	-5.5
2011	-42,551	61,298	66,904	-10.37
2012	-591,458	1,588,372	92,790	-4.8
2013	-54	46	10	-4.95
1995-2013	**-5,077,413**	**12,853,628**	**3,300,085**	**-10.05**

Source: SMART simulations based on author's computations

Because most of the economists believe in the positive impact of trade liberalization on Pakistan's economy, it can be more vigorously analyzed commodity wise and year wise. There should be policy options applied for trade improvements, due to the fact of reduction in tariffs. The above figure shows the primary five commodities; Oil, Machinery, Chemicals, Chemical Products and Electric Equipment with their impact on each commodity individually. Oil, the major imports of the country, showed US $ 2.8 billion loss of revenue due to this liberalizing policy. Although due to the high import of electricity, 6.89 on an average during the whole period, the 11 percent reduction tariff, i.e., liberalizing process, depict a US $ 7.3 billion increase in imports of Oil. Similarly, Machinery and Mechanical appliances show US $ 542 million loss of revenue on import during the full period of 1995-2013 which was US $12.85 billion, but during 2003, 2008, 2010 and 2012, it was recommendable and had significant positive impacts on the economy with amounts around US $ 2 billion in each year.

Table 2. Impact of Trade Liberalization During 1995-2013

Using Wits Smart Model

HS CODE	DESCRIPTION	Average Import Demand Elasticity	Revenue Effect ($ Million)	Trade Effect ($ Million)	Welfare Effect ($ Million)	Average Applied Rate	Average New Rate	Liberalised (%)
CH 27	MINERAL FUELS, OILS	6.89	-2896	7312	1168	9	19	-11
CH 84	MACHINERY & MECHANICAL APPLIANCES, COMPUTERS	2.13	-542	1580	311	14	21	-9
CH 29	ORGANIC CHEMICALS	1.48	-433	996	322	8	16	-9
CH 38	MISCELLANEOUS CHEMICAL PRODUCTS	1.52	-389	277	120	15	26	-13
CH 85	ELECT. MACHINERY & EQUIP. & PARTS, TELECOMMUNICATION EQUIP.	6.05	-332	322	119	37	61	-24
CH 88	AIRCRAFT, SPACECRAFT, & PARTS THEREOF	0.89	-197	112	24	8	27	-18
CH 12	OIL SEEDS/MISC. GRAINS/MED. PLANTS	2.05	-143	78	18	3	12	-9
CH 89	SHIPS, BOATS, & FLOATING STRUCTURES	20.00	-136	358	103	12	30	-17
CH 87	VEHICLES	2.86	-122	239	104	22	33	-14
CH 48	PULP OF WOOD, WASTE & SCRAP OF PAPER	1.69	-121	240	103	17	30	-15
CH 72	PEARLS, STONES, PREC. METALS, IMITATION JEWELRY, COINS	2.96	-116	112	36	15	24	-13
CH 30	PHARMACEUTICAL PRODUCTS	1.37	-98	145	17	18	21	-12

Figure 1. TRADE LIBERALIZATION IMPACT
Source: Own computation, 1995-2013

Trade Effects

WITS/SMART model calculated the total value of trade with the combination of creation and trade diversion. The results calculated through the model, for the period of 1995-2013, for the economy of Pakistan, with the above narrated liberalized process, are reflected below in the figure and above in Table 1 & 2. The five items also showed in the figure below indicate the positive impacts of trade liberalization on the international trade.
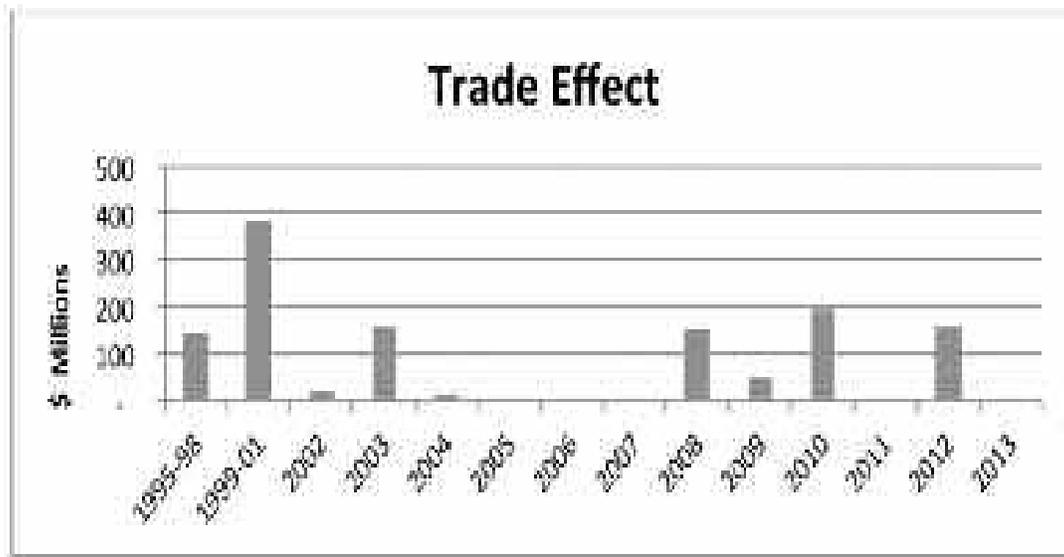
Figure 2. TRADE EFFECT OF TRADE LIBERALIZATION

Revenue Effects

The results in Table 2 specify that due to the reduction of tariff during 1995 - 2013, the revenue effect was calculated around US$ 5.08 billion.
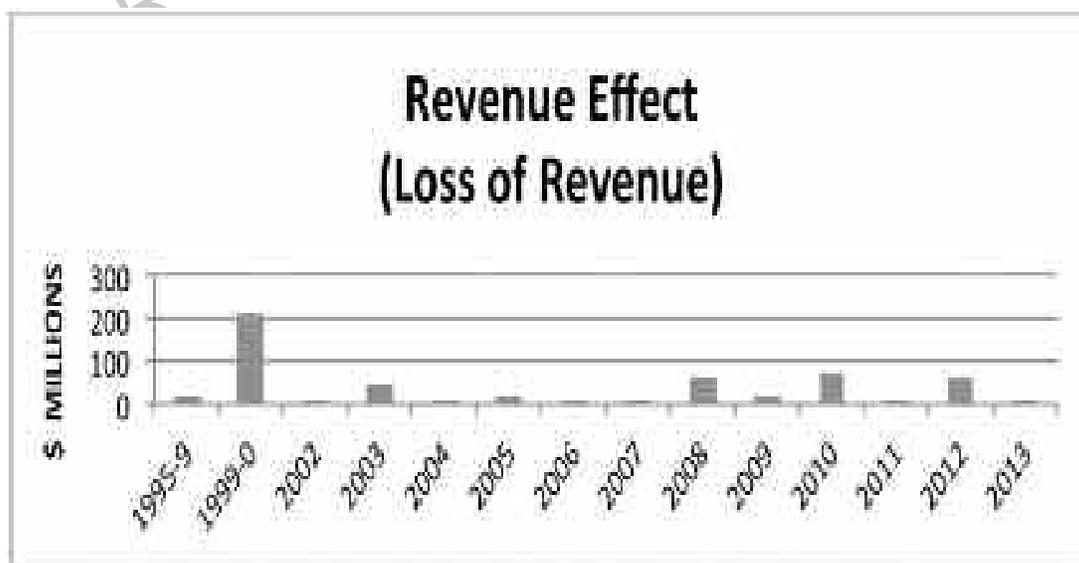
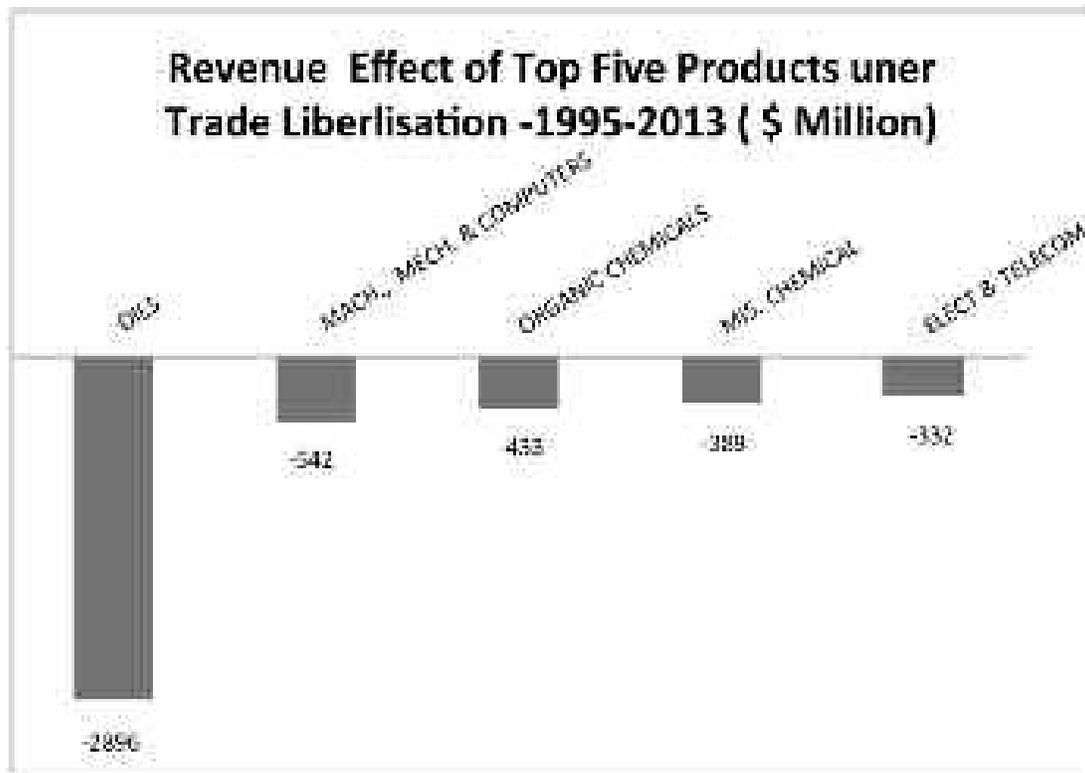Figure 3. REVENUE EFFECT OF TRADE LIBERALIZATION
Source: Own computation, 1995-2013

Figure 4. REVENUE EFFECT OF TRADE LIBERALIZATION
Source: SMART simulations based on author's computations

During 1999-2001, revenue effect was maximum at US $ 2.06 billion due to 34% reduction of tariff (liberalizing trade), which was overall at maximum during the three decades. Later the losses of revenue, US $ 629 million occurred during the year 2008 and continued during 2009 to reach US $ 695 million and US $ 591 during 2012. The results of the WITS / SMART model estimated the overall loss of US $ 5.08 billion over the period of 1995-2013 around 18 years of span. Thus highlighting the objective of the study, that how the government of Pakistan can bridge the loss of revenue for a developing economy like Pakistan. Although there is a more significant encouragement of the rise in trade of the economy i.e. around US$ 12.85 billion, but the loss of US $ 5.08 billion is also another fact. In the figure four, out of major five items show the quantum of impacts on the major item, i.e., Oil and others.

Welfare Effects

The results in the Table 2 specify that the substantial welfare improvement is witnessed in consumer surplus during the selected period as a reduction in tariff happened. It was calculated to US$ 3.30 billion, adding up consumer surplus during 1995-2013 due to the fact of improved trade and availability of more varieties of products at lower prices.
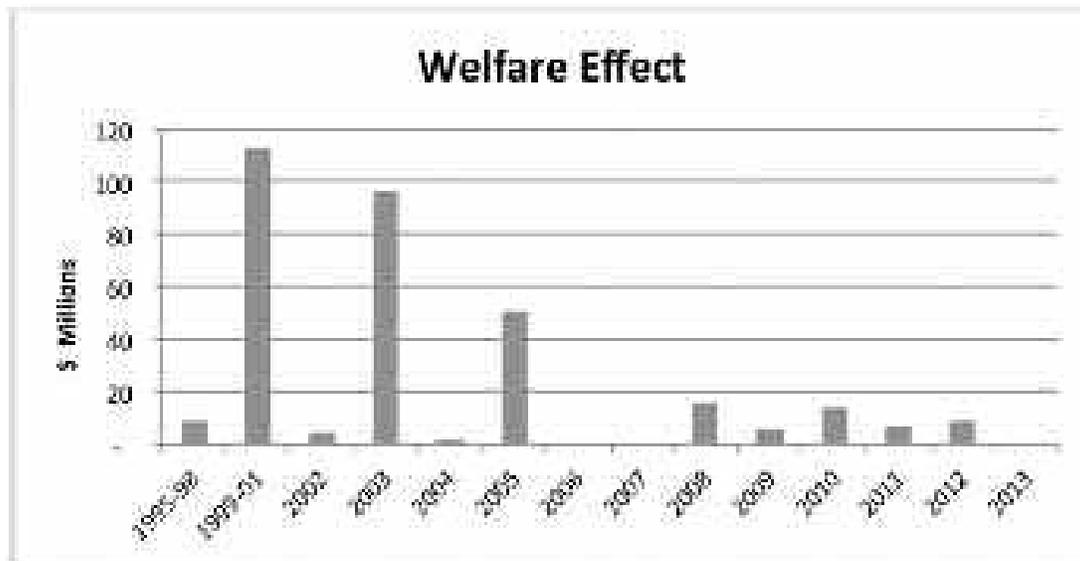
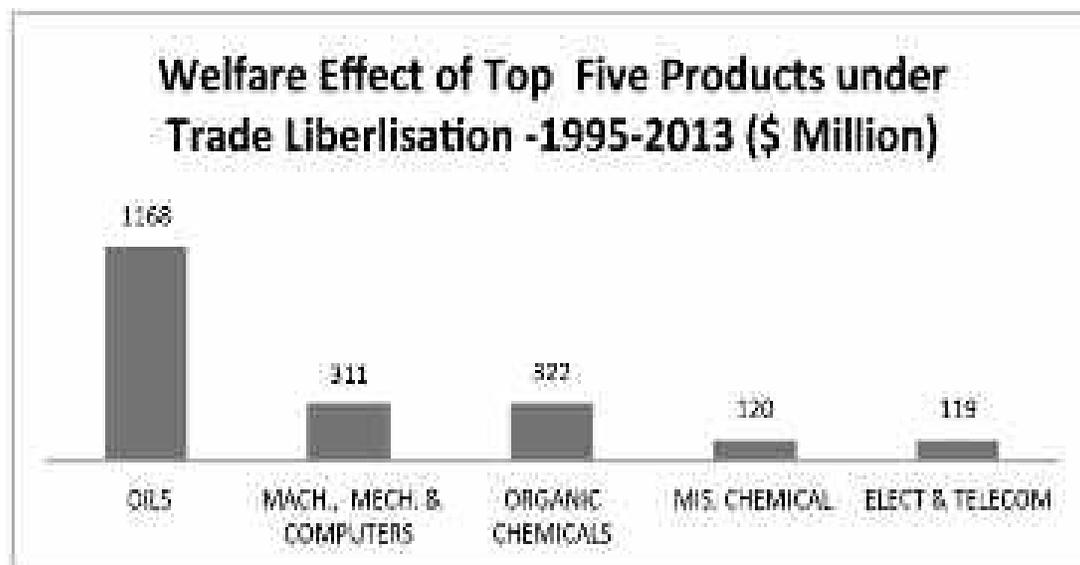Figure 5. WELFARE EFFECT OF TRADE LIBERALIZATION

Figure 6. TRADE LIBERALIZATION OF WELFARE EFFECT
Source: Own computation, 1995-13

The above analysis show that there is an overall increase in trade due to liberalization which is partly due to trade diversion and trade creation. The positive trade effects in Pakistan's economy were observed in overall period of 1995-2013. It is commendable and proves to have a significant positive impact on the economy i.e. around US$ 2 billion in each year and observed a positive impact of trade liberalization on Pakistan's economy. Earlier studies on trade liberalization in Pakistan highlighted the issues of revenue losses and expected budget deficit problems, but did not present detailed analysis with explicitly touching the policy and recovery of loss

of the government revenues due of the liberalizing process. Gadenne (2012), analyzed the fiscal loss due to trade openness using data of 103 developing nations from 1945 to 2006 including Pakistan, and emphasized an increase in the investment in Tax capacity to improve tax revenues. In different case studies, Epaphra (2015) of Tanzania; Basirat, Aboodi, & Ahangari (2014) in case study of Iran; and Karagöz (2013) of Turkey, used the time series data from 1970 to 2010 and Ahmed (2000), in study of Bangladesh economy tried to determine the factors and listed down the factors affecting the trade tax revenue and impacts of trade liberalization.

The current study involves significant commodity wise analysis,and show US$ 542 million loss of revenue on the import during the period 1995-2013. Other significant ten items are measured with the help of WITS/ SMART. The calculation of trade effect in the model shows positive impact of trade liberalization on the international trade. Similarly, revenue effect was calculated at around US $ 5.08 billion. The results of this WITS/ SMART model estimated the overall loss of US $ 5.08 billion over the period of 1995-2013, for around 18 years of span. The welfare results of the studies were calculated as US $ 3.30 billion, adding up consumer surplus during 1995-2013, due to the fact of improved trade and availability of more varieties of products at lower prices.

In the literature, different case studies of Pakistan worked on the subject in a different manner, Ali and Abdullah (2015), listed down the variables to see the impact of trade liberalization; Jaffri, Tabassum, and Asjed (2015), used the ARDL model; and Mahmood and Chaudhary (2013), analyzed the effect of FDI on tax revenue in Pakistan. Mushtaq, Bakhsh, and Hassan (2012), empirically investigated determinants of trade and aggregate tax revenue and tried to examine the effects of different elements on tax revenue and trade taxes in Pakistan. However, this study attempted to analyze more vigorously the commodity wise and year wise data in a different way than other previous studies and conclude that policy options should be applied for the trade improvements due to fact of reduction in tariffs.

DISCUSSION AND CONCLUSION

The endeavour to unravel the ambiguity between the relationship of total tax revenue and trade liberalization in the economy of Pakistan has been undertaken in this study, using the Software for Market Analysis and Restriction (SMART) model developed by the United Nations Conference on Trade and Development (UNCTD) and the World Bank taking data

from the period of 1995 to 2013. It is assumed that the trade openness, fewer restrictions and reduction in tariff rates bring revenue problems in case of developing nations like Pakistan. This study on Pakistan's economy for the period of 1995 – 2013 also concluded, that the trade liberalization in the form of tariff reforms has increased the overall trade and welfare of consumers but reduced the trade tax revenue significantly. This implies that liberalization policies have been able to significantly affect international trade tax revenue in short as well as in the long run. Therefore, policy measures should follow the impacts of the policy in the long term and in short term as well. Macroeconomic policies of Pakistan during the observed period supported the assumption, that the prevailing macroeconomic environment can significantly facilitate successful trade liberalization with improvement in trade volume and consumer surplus. Therefore, a sound macroeconomic policy environment can significantly facilitate successful trade liberalization.

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