Pre and Post Evaluation of Pakistan-Sri Lanka Free Trade Agreement

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Abstract: The objective of this article is to evaluate the impact of Pakistan-Sri Lanka Free Trade Agreement (FTA) on Pakistan's and Sri Lanka's macroeconomic structures. The FTA is operational since June 2005. For this purpose, the Computable General Equilibrium (CGE) Model has been used and simulations have been conducted by using the Global Trade Analysis Project (GTAP) model, which measures the effect of FTA on Pakistan. The GTAP is a General Equilibrium modeling structure of the multiple economies. The finding of this study reflects that Pakistan has positive impact on real GDP, trade and welfare, while Sri Lanka has negative impact on the same factors. Moreover, the results of this study are coherent with the international trade theories. This research assists the trade policy makers to adopt appropriate policies for future FTAs with South Asian economies to obtain more gains for Pakistan.

Keywords: Pakistan; Sri Lanka; FTA; General Equilibrium; GTAP.

JEL Classification: F15.

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1. Introduction

Trade liberalization has accompanied increased globalization in many countries and this has been accomplished with reductions in trade tariffs. While many countries have accessed more export markets as global trade barriers generally decline, the recent trend in bilateral trade agreements has led to renewed interested in the impact of free trade agreements on countries.

Recent work on the economic impacts of free trade agreements include Alexander (2021), Saira et al. (2021), Yakubu et al. (2018), Kiendrebeogo and Minea (2017), Marilyne et al. (2017), Valentina et al. (2016), Rose (2004), Plummer (2006), Karmakar (2005), Kawai and Wignaraj (2007), and Mai et al. (2010). Dion (2004) investigated regional economic integration (REI) and found that it affected economic growth through technology transfers from high-technology to low-technology countries. Researchers such as Henrekson et al. (1997), Badinger (2001, 2005), Amurgo-Pacheo and Pierola (2007), Jong-Wha et al. (2008), Nwosu et al. (2013), and Anderson et al., (2001) all found that economic integration led to higher growth. While these studies have looked at various free trade agreements, there has been less work done on trade agreements between two less-developed economies. This study attempts to fill this gap by focusing on the Pakistan-Sri Lanka FTA. We will look at how the tariff reductions that occurred under this free trade agreement led to increases in GDP, the level of trade, and welfare.

Between 2003 and 2014, Pakistan's GDP Average Annual Growth Rate (AAGR) from 2003 to 2014 was 11.11%, as opposed to Sri Lanka's 6.59% for the same time period. In terms of bilateral trade, the volume of trade between Pakistan and Sri Lanka increased from US$200 million to US$ 374 million between 2004 and 2012 (Economic Survey of Pakistan 2011-2012).

In terms of their external situation, by 2017 Pakistan and Sri Lanka both faced trade deficits. Pakistan had a trade deficit of $35.6 billion with exports of $21.9 billion and imports of $57.4 billion. Likewise, Sri Lanka had a trade deficit of $9.6 billion with exports of $11.7 billion and imports of $21.3 billion. Nevertheless, Pakistan's total exports to Sri Lanka hit

US$269 million while imports reached US$103 million. In 2017, Pakistan's trade complementarity index (on a scale of 0 to 100) with Sri Lanka was 27.95, though Sri Lanka's trade complementarity index with Pakistan was 23.67 (Pakistan Business Council).

Pakistan and Sri Lanka signed an FTA on July 2002, which came into effect on June 12, 2005 to reduce tariffs on a variety of goods. Immediately, at the 6-digit Harmonized System (HS) level, Pakistan provided 100 percent concessions on 206 items; likewise, Sri Lanka provided 100 percent concessions on 102 at a similar HS level. Pakistan and Sri Lanka included 540 and 697 items at the 6-digit HS level respectively on a "no concessions" list. Sri Lanka's "no concession" list was reduced to 607 items by April 2013. Furthermore, Pakistan had given duty-free tariff rate quotas (TRQ) on tea products exported to Sri Lanka. Pakistan had also given a 35 percent margin of preference on the MFN rate on the export of several clothing items to Sri Lanka. In return, Pakistan received duty-free TRQs on long-grain basmati rice and potatoes. Sri Lanka also gave full concessions to major Pakistani exports such as cotton, apparel, knitted fabrics, and cement. Reciprocally, Pakistan gave full concessions to some of Sri Lanka's major exports such as rubber, coconut products and vegetable products (Ministry of Commerce, Pakistan).

In March 2009, Pakistan completed its phasing out obligations by offering Sri Lanka duty-free market entry on more than 4,500 products. In a similar manner, Sri Lanka completed their phasing out obligations in November 2010 (Pakistan Business Council).

Table-1.1 reflects Pakistan's trade trend with its major SAARC trading partners during 2013-14. We will need these trade trends to prepare the aggregation scheme in the GTAP model. While Pakistan is a member of the South Asian Free Trade Agreement (SAFTA), trade with other South Asian economies accounts for less than 5 percent of Pakistan's exports and less than 5 percent of Pakistan's imports, implying that SAFTA is effectively non-functional. Political and military tensions between Pakistan and India do play a significant factor in terms of a lack of progress in regards to SAFTA in general. Looking at the numbers, Pakistan's trade with Sri Lanka is comparable to its trade with other South Asian countries, with exports to Sri Lanka making up approximately 1.34 percent of Pakistan's total exports and imports from Sri Lanka making up 0.156 percent of Pakistan's total imports. This shows a relatively positive trade position for Pakistan in terms of its trade with Sri Lanka, since its exports to Sri Lanka are greater than its imports from Sri Lanka.

Table: 1.1 Trade Trend of Pakistan with Sri Lanka

Regions	Pakistani Exports (Rs Million)	% share in total Pakistani Exports	Pakistani Imports (Rs Million)	% share in Total Pakistani Imports.
SAARC	**132847**	**5.6137**	**208480**	**4.7928**
Bangladesh	68673	2.90191	5999	0.1379
India	31700	1.33954	195500	4.4944
Sri Lanka	31718	1.3403	6785	0.156
Total	**2366478**	**1**	**4349879**	**1**

Source: Pakistan Economic Survey (2013-14), various issues.
Note: Columns 3 and 5 shows the % share of exports and imports by regions and some of the major SAARC trading partners of Pakistan in total exports and imports of Pakistan respectively. For example Sri Lanka's share is 1.34 % and 0.156 % in total exports and imports of Pakistan respectively

In view of the above, it is evident that Pakistan can potentially build on its trade surplus with Sri Lanka, in contrast the trade deficit it has with other countries, such as India.

The trade literature has focused on the positive impacts of increased trade. Krugman (1991) and Krugman and Venables (1996) provide theoretical models that explore how trade with relatively higher productivity countries can lead to productivity spillovers and economic growth. But while the gains from trade are well-accepted, others including Hem et al. (2020), Khan, (2010), Kemal, (2004), Coulibaly, (2007), Alam et al. (2011)) find that South Asian trade has not reached its full potential due to its being severely restricted. These trade restrictions have meant that SAFTA (the South Asian Free Trade Agreement) has had limited impact (Soz & Srivastava, 2010). But while SAFTA produced limited results, Nufile et al. (2013) found that the amount of trade between Pakistan and Sri Lanka trade has improved. Slaughter (1997) and Venables (1999) discussed how dynamic regional integration failed in South Asia because of fragile institutions combined with flaws in their political and economic systems. The perceived failure of SAFTA is one of the reasons why these economies have focused on bilateral free trade agreements (FTAs) such as the ones Pakistan signed with Sri Lanka, Malaysia and China.

Keeping in mind the potential benefits of the bilateral free trade agreement between Pakistan and Sri Lanka, this study looks at the impact of this FTA on key macroeconomic variables such as trade balances; production, imports, and exports across sectors; real Gross Domestic Product (GDP); and welfare in both countries.

The rest of the study is organized as follows. Section 2 discusses the relevant literature and our hypotheses. The methodology is discussed in Section 3, followed by a discussion of the results in Section 4. Section 5 will present the conclusions.

2. Literature Review

This section reviews the theoretical and empirical literature on the impacts of free trade agreements on the economic development and welfare of partner economies. We use this literature to construct our hypotheses.

2.1 *Theoretical Overview*

International trade theories can be roughly divided into traditional trade theory and contemporary trade theory. Accordingly, traditional theories of trade integration, such as Viner's (1950), argue that free trade increases welfare if a country imports a good or service that is produced more efficiently in another country while exporting a good or service that it produces relatively more efficiently.   In other words, each country in a bilateral trade agreement can benefit if it exports that good or service that it has a comparative advantage in producing. So, in theory the bilateral trade agreement between Sri Lanka and Pakistan (under optimal circumstances) should lead to higher exports for both countries as well as increased economic growth.

Traditional trade theory does not, however, take into account dynamic impacts of trade integration. Nevertheless, theorists such as Hosny (2013) and Marinov (2014) developed contemporary theories of trade liberalization that reflect the dynamic nature of international growth. Prior to this, Balassa (1961) and Cooper and Massell (1965) had initially introduced these impacts of regional trade creation. Then, in 1998, Schiff and Winters suggested that the dynamic impacts of economic collaboration within free trade agreements among members also leads to economic growth in these countries. According to Tumwebaze et al. (2015) and Bustos (2011), significant positive dynamic impacts occur as a result of foreign direct investment (FDI) and reductions in per unit cost, with the transfer of the latest technology and human resources. These similar concepts were further elaborated upon by Grossman and Helpman (1991), Rivera-Batiz and Romer (1991), and Romer (1990) in the context of trade integration.

Heckscher-Ohlin's factor price equalization theory was used by Williamson (1996) who argued that the trade liberalization can lead to income convergence across countries. The fundamental novelty of this theory is that countries export products if they are well-endowed in regards to factors of production, and then import those products with countries that are less endowed. Therefore, every country, in theory, could specialize in producing certain products and services and have a comparative advantage. This would imply equalization of product and factor prices, leading to higher wages in less developed economies.

Slaughter (1997) criticized the Heckscher-Ohlin's factor price equalization theory, asserting that income convergence due to trade liberalization was unrealistic. In the context of developing and developed economies, he argued that developed economies tend to benefit more than developing economies. This is because developed economies enjoy the benefits of economies scale and because they are more diversified economies that trade with a greater number of countries, as compared to developing economies who primarily rely on trade based primarily on agriculture and natural resources. If one was to related this argument to South Asia, a South Asian country trading with a larger, developed economy should benefit relatively less.

In 1999, Venables supported the above argument and theorized that North-North agreements would lead the income convergence between these economies, whereas South-South agreements could lead to income divergence. Therefore, the theoretical literature on regional integration does not find that trade agreements lead inevitably to income convergence.

2.2   Empirical Overview

Empirical work related to regional integration has emphasized trade creation as a result of regional trade agreements. Frankel and Romer (1999) find a positive relationship between bilateral trade agreements and GDP per capita. A significant amount of research over the years has suggested that if South Asian countries minimize inefficiencies at their borders, it would in theory be possible for these countries to achieve trade benefits (Weerahewa, 2009).

Hiroyuki and Don (2019), Farhat and Juthathip (2018), Govinda (1994), Srinivasan (1994), DeRosa et al (1996), Bandra et al (2003), Weerahewa (2007)) have also found that potential gains have been achieved by South Asia nations through improved trade. Similarly,

positive impacts of trade have been observed in a number of other recent studies (Muhammad et al., 2018; Tzu-En et al. 2016; Wilson et al, 2005 and 2005; World Bank, 2008). Bandra and Yu (2003) examined SAFTA, with a particular focus on India,"and with the help of CGE modelling they found that India benefitted from the agreement.

In contrast, other researchers have found that economic integration may have negative or no effect on economic development. De Melo et al. (1992) investigated economic integration between developing economies and results found no positive effects on development and incomes. Similarly, Vamvakidis (1999) an Berthelon (2004) found a negative impact of trade agreements between developing economies on economic development.

Among the trade skeptics, some researchers have focused their empirical analyses on South Asian countries. Pitigala (2005) and Baysan et al (2006) discuss the diversion of trade due to high trade barriers with the region and conclude that if trade barriers such as tariffs are eliminated, the expansion of trade between Pakistan, Sri Lanka, Bangladesh, India and Nepal could occur. This has been also suggested by Srinivasan et al (1993) and Batra (2004). Batra (2004), in particular, examined India's trade relationship with 145 countries, and ascertained that Pakistan-India trade had the greatest potential within South Asia. According to Taneja et al (2013), political tensions between Pakistan and India served as the major barrier to successful implementation of SAFTA. Similarly, Khan (2010), Kemal (2004), Coulibaly (2007) and Alam et al (2011), found that SAARC countries had limited trade with each other despite high potential and concluded that South Asia could be considered to be one of the least integrated economic regions.

Keeping the above highlighted literature in mind, we test the following hypotheses:

H_1: Pakistan-Sri Lanka FTA has had a significant effect on the real GDP of each economy;

H_2: Pakistan-Sri Lanka FTA has had a significant effect on the imports and exports of each economy;

H_3: Pakistan-Sri Lanka FTA has had a significant impact on the imports and exports and production/output in different industries of each economy;

H₄: Pakistan-Sri Lanka FTA has had a significant impact on each economy's welfare.

3. Methodology

The effects of two-sided tariff elimination were assessed with the assistance of a GTAP model (Hertel, 1996), which is a multi-economy comparative static CGE model. Furthermore, the CGE model is a combination of linear equations along with percentage changes in variables. The CGE model, which is an extension of the Input-Output model, is also known as the Applied General Equilibrium (AGE) model. This model has a power to forecast how an economy or economies react to changes in trade policy, technology, or any other external factor. Moreover, the model also has the capability to identify the behavior of different economic agents.

Firms will attempt to optimally use their resources and maximize their profits. Similarly, households want to maximize their utility. The role of commodity and factor prices is highlighted by these assumptions, and the decisions concerning the consumption and production of households and firms are price dependent. Moreover, these assumptions help to measure the demand and supply decisions of different economic agents, and can aid in determining the prices of some goods or factors. The numerical results can be extracted from the CGE model, which is the core benefit of using this model. The coefficients and parameters of the equations are estimated on the basis of numerical databases, with a set of inputs and outputs tables of various economies acting as an important resource for the model. This database reveals the specific year of accounts for the flow of goods and factors among different sectors.

Version 9 of GTAP is used, which consists of 57 sectors for every region (a total of 140 regions; see Appendix 1 & 2). For policymakers the model is attractive as it has many attributes such as different products of a particular country, savings of production sectors, capital mobility from one country to another, multiple trading regimes, different production technologies and an international transport sector. Moreover, it has numerous policy variables that include tariffs, subsidies on goods, and others.

The model explains production technology using three levels of Leontief and CES "(Constant Elasticity of Substitution) production functions. Inputs are segregated into primary factors and intermediate inputs. Every sector is assumed to pick inputs in order to reduce the cost

of a particular output. In the first stage, firms utilize a mix of primary factors and intermediate inputs, as defined by a Leontief production function; at the second stage, intermediate inputs consist of domestic and imported commodities of a similar input-output class. Further, primary factors inputs are a mix of natural resources, land, capital, skilled labor, and unskilled labor. Thus, the CES function is utilized to mix both categories. Lastly, the CES aggregation of imported commodities of every region is decided when firms select the best mix of domestic and imported commodities of the similar input-output class, depending upon the prices of imported and local products. This approach is also known as an Armington approach to modeling import demand.

Consumer behavior is a function of aggregate utility over consumption of households, consumption of the government, and savings. "In the GTAP model, a Cobb-Douglas function is used to define aggregate utility and the consumption of government. Furthermore, a Constant Difference of Elasticity (CDE) expenditure function defines the consumption of households.

The production of capital is done through investment, which in turn is financed by an international savings pool. Every economy involved provides its share of income as savings in the international bank saving pool, with the bank in question operating as a manner of global mediator between savings and investments.

The GTAP database version-9 has 140 regions, which are aggregated into 10 regions. For the sake of simulation models, Pakistan and Sri-Lanka are aggregated separately while the rest of the economies are aggregated into eight regions (such ASEAN, European Union, China, Malaysia, the rest of West Asia, the rest of SAARC, the rest of the Americas, and all remaining economies). Likewise, 43 sectors are aggregated out of 57 sectors related to their nature of outputs.

The major exports of HS-6 codes are mapped with GTAP codes. For that reason, we categorize the major exports from Pakistan to Sri Lanka as those which are equal to or greater than US$ 1 million for the time period of 2000-2014. Likewise, the major imports of HS-6 codes are also mapped with GTAP codes. The major imports of Pakistan from Sri Lanka are categorized as those are equal to or greater than US$ 500,000 for the time period of 2000-2014.

4. Simulation Results of GTAP

The Pakistan-Sri Lanka FTA analysis is conducted through GTAP simulations. For that purpose, the import tariffs of Pakistan and Sri Lanka are taken as zero. Furthermore, in the GTAP the model closure is utilized as standard multi-regional general equilibrium closure.

4.1 Simulated Aggregate Effects

In context of real GDP, the simulated aggregate effect of the Pakistan-Sri Lanka FTA is presented in table 4.1. Both countries experienced positive changes in their real GDP; Pakistan's increase in GDP is $4.22 million and Sri Lanka's increase in GDP is $5.91 million. This indicates that both countries' real GDPs are expanding.

Table # 4.1"

Real GDP	Business as Usual $ million"	"Post-FTA $ million	Change $ million
Pakistan"	"213,686.2"	"213,690.42"	"4.22"
Sri Lanka"	"59,178.04"	"59,183.96"	"5.91"

Source: Author's results from a GTAP simulation."
Notes: The GTAP variables used are: (i) qgdp for Real GDP

The trade impact of the Pakistan-Sri Lanka FTA is depicted in table 4.2. Both countries experience increases in exports; however, Sri Lanka's trade growth appears to be greater than Pakistan's. But interestingly, Pakistan's trade surplus with Sri Lanka increases while Sri Lanka's trade deficit with Pakistan increases. The result shows that Pakistan's terms of trade improved, while Sri Lanka's terms of trade deteriorated.

Table #4.2"

Aggregate Effects"	Change in Export Value ($ Million)	Change in Import Value ($ Million)	Change in Trade Bal. value($ Million)	Change in Terms of Trade (%)
Pakistan"	143.0056"	21.1414	121.8642	0.0718
Sri Lanka"	19.2916"	167.4087	-148.1171	-0.1209

Source: Author's results from a GTAP simulation."
Notes: The GTAP variables used are: (i) VXWD for export value, (ii) VIWS for import value, (iii) VXWD for the initial level of exports and VIWS for the initial level of imports and (iv) tot for the terms of trade."

4.2 Simulated Sectoral Effects

The Pakistan-Sri Lanka FTA simulation's impact on sectors of Pakistan is depicted in table 4.3. Beverages and tobacco has the largest relative output expansion of 0.53% due to increases in export volume, at $18.99 million as compared to the base year. The textile sector has an output increase of 0.21% because of second largest increase in export volumes, at $6.01 million from base year. Wearing apparel experiences growth of 0.23% as a result of expansion in export volume, at $2.68 million compared to the base year. Ferrous metals have the second largest output increase of 0.39% with an expansion in export volumes of $4.53 million from base year. The other significant export sectors are processed rice, vegetable, fruits and nuts and mineral products, whose output and export volume percentage change are expanded as a result of increase in export volumes at $16.25 million, $5.96 million, and $2.74 million as compared to the base year. These sectors contribute to the expansion in Pakistan's real GDP. The general increase in export volumes can be attributed to tariff reductions and increase in export prices in all of these above mentioned sectors. Table 4.3 shows that the sectors have absolute percentage changes of less than 0.12% for export prices and less than 6.93% for export volume. The decrease in output in the wood products sector related to the drop in import price of 0.09% and an increase in import volume of 0.53% and $1.07 million as compared to the base year. Furthermore, the output of vegetable oil and fats decreases with a decrease in the import price and an expansion in import volume of 0.22% and $2.84 million as compared to the base year; together these clearly indicate a reduction in the local supply of wood products, vegetable oil, and fats products in local Pakistani markets."

Table # 4.3: Simulated Sectoral Effects of the Pakistan Sri Lanka FTA on Pakistan (% change)

GTAP Code"	Pakistan – Sectors"	Domestic Output (qo)	Export Prices (pxw)	Exports Volume (qxw)"	Import prices (pim)	Imports Volume (qiw)
Wht"	Wheat"	"0.05"	"0.11"	"-0.28"	"0"	"0.34"
V_f"	Vegetables, fruit, nuts"	"0.07"	"0.12"	"2.42"	"-0.01"	"0.24"
Osd"	Oil seeds"	"-0.13"	"0.07"	"1.33"	"0"	"-0.04"
OCR"	Crops nec"	"0.04"	"0.12"	"3.15"	"0"	"0.39"
Sgr"	Sugar"	"0.01"	"0.09"	"-0.35"	"0"	"0.25"
Pfb"	Plant-based fibers"	"-0.22"	"0.05"	"-0.21"	"0"	"-0.13"
Oap"	Animal Product nec	"0"	"0.11"	"-0.25"	"-0.01"	"0.16"

GTAP Code"	Pakistan – Sectors"	Domestic Output (qo)	Export Prices (pxw)	Exports Volume (qxw)"	Import prices (pim)	Imports Volume (qiw)
Fsh"	Fishing"	"0.01"	"0.09"	"-0.16"	"0"	"0.12"
PCR"	Processed rice"	"0.5"	"0.12"	"1.21"	"0"	"0.53"
OFD"	Food Products nec"	"0.17"	"0.1"	"0.74"	"-0.01"	"0.16"
Vol"	Vegetable oil & fats"	"-0.1"	"0.06"	"-0.35"	"-0.03"	"0.22"
b_t"	Beverages & Tobacco"	"0.53"	"0.08"	"6.93"	"0"	"0.1"
Tex"	Textiles"	"0.21"	"0.06"	"0.33"	"-0.01"	"0.1"
Wap"	Wearing apparel"	"0.23"	"0.06"	"0.33"	"-0.02"	"0.26"
Lea"	Leather products"	"0.18"	"0.08"	"0.32"	"0"	"0.23"
Wood"	Wood products"	"-0.07"	"0.07"	"0.23"	"-0.09"	"0.53"
PPP"	Paper product, publishing"	"-0.06"	"0.06"	"0.05"	"-0.01"	"0.16"
Crp"	Chemical, rubber,plastic products"	"-0.08"	"0.06"	"0.73"	"-0.01"	"0.07"
omn"	Minerals nec"	"-0.04"	"0.06"	"-0.08"	"0"	"0.03"
Nmm"	Mineral products nec"	"0.04"	"0.07"	"0.63"	"-0.01"	"0.22"
fmp"	Metal products"	"0.07"	"0.06"	"0.19"	"0"	"0.04"
Nfm"	Metals nec"	"-0.18"	"0.06"	"-0.26"	"0"	"0.1"
i_s"	Ferrous metals"	"0.39"	"0.06"	"4.17"	"0"	"0.07"
Autoparts	Autoparts"	"-0.03"	"0.04"	"0.79"	"0"	"0.08"
Ele"	Electronic equipment"	"-0.07"	"0.06"	"0.86"	"0"	"0.2"
Ome"	Machinery & Equip nec"	"-0.3"	"0.05"	"-0.32"	"0"	"0.03"
Omf"	Manufactures nec"	"-0.19"	"0.06"	"-0.41"	"-0.01"	"0.22"

Source: Author's results from a GTAP simulation.
Notes: The GTAP variables used to calculate percentage changes are (i) qo for domestic output, (ii) pxw for export price (equal to pm, i.e., output price, in this simulation)(iii) pim for import price; and (iv) qxw for aggregate exports of i from region r, FOB weights, qiw for aggregate imports of i into region s, CIF weights and DQXS for the volume change in exports and imports in terms of $millions. **HS 6 Codes and product description is mentioned in Appendix-3**

Table 4.4 depicts the simulation effects of the Pakistan-Sri Lanka FTA on Sri Lanka's sectoral output and trade. The output of wheat, vegetable, fruit and nuts, fishing, processed rice, beverages and tobacco,

and ferrous metals fall while the rest of the sectors experience increases in output. All these sectors experience decreases in export prices. Moreover, sectors which are prominent in deteriorating Sri Lanka's trade balance are vegetable, fruit and nuts, processed rice, beverages and tobacco, ferrous metals, wearing apparel, textile and mineral products because of increase in import volume percentage change. Vegetable oil & fats has the largest relative expansion in output, that is 1.34% and wood products have the second largest relative growth in output at 0.69%, due to increases in export volume of approximately 1.84% and 1.78% respectively. Processed rice's import price fall of 10.01% is accompanied by the largest relative expansion in import volume of 31.93%.

Table # 4.4 Simulated Sectoral Effects of the Pakistan Sri Lanka FTA on Sri Lanka (% change)

GTAP Code	Sri Lanka – Sectors	Domestic Output (qo)	Export Prices (pxw)	Exports Volume (qxw)	Import prices (pim)	Imports Volume (qiw)
Wht"	Wheat"	"-0.11"	"-0.04"	"0.34"	"-0.04"	"0.1"
V_f"	Vegetables, fruit, nuts"	"-0.06"	"-0.25"	"0.99"	"-0.84"	"1.17"
Osd"	Oil seeds"	"0.43"	"-0.1"	"0.43"	"-2.4"	"8.26"
OCR	Crops nec"	"0.23"	"-0.15"	"0.9"	"-0.22"	"0.56"
Sgr"	Sugar"	"0.26"	"-0.14"	"0.7"	"0"	"0"
Pfb"	Plant-based fibers"	"0.15"	"-0.04"	"0.15"	"0"	"0.29"
Oap"	Animal Product nec"	"0.02"	"-0.21"	"0.76"	"-0.01"	"-0.23"
Fsh"	Fishing"	"-0.01"	"-0.08"	"0.15"	"-0.03"	"-0.07"
PCR"	Processed rice"	"-1.19"	"-0.52"	"2.58"	"-10.01"	"31.93"
OFD"	Food Products nec"	"0.07"	"-0.11"	"0.42"	"-0.47"	"0.53"
Vol"	Vegetable oil & fats"	"1.34"	"-0.09"	"1.84"	"0"	"-0.09"
b_t"	Beverages & Tobacco"	"-1"	"-0.09"	"0.19"	"-13.56"	"24.51"
Tex"	Textiles"	"0.33"	"-0.05"	"0.44"	"-0.06"	"0.26"
Wap"	Wearing apparel"	"0.27"	"-0.06"	"0.41"	"-0.39"	"1.03"
Lea"	Leather products"	"0"	"-0.05"	"0.43"	"-0.49"	"0.97"
Wood	Wood products"	"0.69"	"-0.04"	"1.78"	"-0.04"	"0.45"
PPP"	Paper products, publishing"	"0.02"	"-0.03"	"0.75"	"0"	"0.04"
Crp"	Chemical, rubber, plastic products"	"0.23"	"-0.05"	"0.61"	"-0.05"	"0.08"
Omn	Minerals nec"	"0.04"	"-0.03"	"0.05"	"0"	"0.02"

GTAP Code	Sri Lanka – Sectors	Domestic Output (qo)	Export Prices (pxw)	Exports Volume (qxw)	Import prices (pim)	Imports Volume (qiw)
Nmm"	Mineral products nec"	"0"	"-0.04"	"0.35"	"-0.26"	"0.47"
Fmp"	Metal products"	"0.15"	"-0.14"	"1.04"	"-0.06"	"0.16"
Nfm"	Metals nec"	"0.38"	"-0.05"	"0.49"	"-0.06"	"0.31"
i_s"	Ferrous metals"	"-0.04"	"-0.05"	"0.45"	"-0.27"	"0.3"
Autoparts	Autoparts"	"0.19"	"-0.07"	"0.41"	"-0.01"	"0"
Ele"	Electronic equipment"	"0.15"	"-0.06"	"0.52"	"-0.01"	"0"
Ome	Machinery & Equip nec"	"0.43"	"-0.08"	"0.75"	"0"	"0.01"
Omf"	Manufactures nec	"0.45"	"-0.07"	"0.54"	"-0.02"	"0.08"

Source: Author's results from a GTAP simulation."
Notes: The GTAP variables used to calculate percentage changes are (i) qo for domestic output, (ii) pxw for export price (equal to pm, i.e., output price, in this simulation)(iii) pim for import price; and (iv) qxw for aggregate exports of i from region r, FOB weights, qiw for aggregate imports of i into region s, CIF weights and DQXS for the volume change in exports and imports in terms of $millions. **HS 6 Codes and product description is mentioned in Appendix-3**

4.3 Simulated Welfare Effects of the Pakistan Sri Lanka FTA

The simulated welfare impact of the Pakistan-Sri Lanka FTA is presented in Table 4.5. This simulation shows Pakistan an increase in welfare, whereas Sri Lanka faces a fall in total welfare. The import prices of 16 sectors of Pakistan remain unchanged, while the remaining sectors are exposed to lower import prices. Since the reduction of tariffs with Sri Lanka, the export prices of in all sectors of Pakistan have increased; Pakistan's terms of trade improve as Pakistan receives a higher price for its exports in comparison to Sri Lanka's export prices, which have declined after the simulation. The simulations show that Pakistan achieves a net welfare gain with positive change in allocative efficiency, whereas Sri Lanka loses in net welfare but experiences a positive change in allocative efficiency. Pakistan's positive allocative efficiency shows a shift of resources from inefficient sectors to more efficient sectors but achieves less allocative efficiency than Sri Lanka, hence creating more jobs. The best performing sectors of Pakistan, which help in achieving positive allocative efficiency, are vegetable oil and fats, metal products, chemical products and auto parts. The net simulated welfare impact on Pakistan is net welfare gain of US$ 26.43 million, however, Sri Lanka has a net welfare loss of US$ 7.74 million. Pakistan's net welfare gain is primarily due to the improved terms of trade.

Table # 4.5: Simulated Welfare Effects of Pakistan Sri Lanka FTA and Decomposition ($ millions)"

Welfare"	"Allocative Efficiency"	"Terms of Trade Effects"	"Total"
Pakistan"	"4.0279"	"22.4018"	"26.4297"
Sri Lanka"	"7.7145"	"-15.4496"	"-7.7351"

Source: Author's results from a GTAP simulation."

Note: The Global Trade Analysis Project (GTAP) variable containing the decomposed numbers above is welfare."

These results are in line with previous literature, since the real GDP of Pakistan and Sri Lanka are raised by more open trade. Therefore, this result is consistent with the findings of Kawasaki (2003) and Chandrima and Biswajit (2011). Pakistan's trade balance is improved, whereas Sri Lanka faces a decrease in exports and increase in imports, which clearly indicate that FTAs affect trade balances. These results are in line with those found by David (2010), Kawasaki (2003), Srinivasan et al. (1993), and Batra (2004). The imports, exports, and output of different sectors are in line with the work of Brooks et al. (2005) and Akram (2013)."The welfare results are in line with the results of"Disdier and Marette (2009), Ken and Hiro (2012), and Veeramani and Saini (2010). "

5. Conclusion

In this study, the Pakistan-Sri Lanka FTA has been examined. We investigate the impact of this agreement on real GDP, imports/exports, sector-wise production, and welfare scenarios for both countries. We find that sectors like beverages and tobacco, textile, apparel, metal products, processed rice and vegetables, and fruits and nuts expand, which lead to growth in Pakistan's real GDP due to the rise in exports to Sri Lanka. The sectors which prominently contribute to the deterioration in Sri Lanka's trade balance are vegetables, fruit and nuts, processed rice, beverages and tobacco, metal products, wheat, plant-based fibers, textile and mineral products because of an increase in imports from Pakistan. In spite of this, Sri Lanka's real GDP has improved. Overall the trade volume between both countries has surged, which is similar with is in line with the theory of trade proposed by Viner (1950) and other contemporary theorist like Schiff and Winters (1998), Hosny (2013) and Tumwebaze et al. (2015). Our results are also consistent with the findings of Kawasaki (2003) and Chandrima and Biswajit (2011). Our results also show that Pakistan's trade surplus grows

while Sri Lanka's trade deficit expands which is in line with the results of David (2010), Kawasaki (2003), Srinivasan et al. (1993) and Batra (2004).

In addition, this study finds that Pakistan is the main beneficiary in terms of net welfare due to efficient allocation of resources and positive terms of trade. This welfare situation of Pakistan increases due to increase in exports prices of all sectors, whereas major import prices are decreased. These findings are consistent with the theoretical models of Viner (1950) and Williamson (1996). Sri Lanka's terms of trade falls, however, due to the prices of exports being reduced in almost all sectors. Furthermore, Sri Lanka's net welfare falls mainly because of its negative change in terms of trade. These results are consistent with the research findings of Disdier and Marette (2009), Ken and Hiro (2012), and Veeramani and Saini (2010).

"The highlighted results indicate that Pakistan is the greater beneficiary of the FTA in terms of real GDP, trade and welfare, as compared to Sri Lanka. Even still, the State Bank of Pakistan (SBP) has suggested the provision of subsidized loans to Pakistani exporters to produce quality exports for Sri Lanka at even lower prices. It has also been proposed that the Government of Pakistan should provide training facilities to farmers to produce quality agricultural products. This would potentially enable trade policymakers to negotiate with Sri Lankan decision makers regarding enhancing the Tariff Rate Quota (TRQ) for vegetables, fruits and nuts, processed rice, tobacco, wheat, plant-based fibers, and textile products as these products are highly demanded by Sri Lankan consumers. Moreover, in Phase II of the Pakistan-Sri Lanka FTA, both countries can also focus on education and banking sectors to have even stronger economic ties.

Although Sri Lanka does not appear to be benefitting in terms of the FTA, there are potential benefits in the future, as Sri Lanka does require support from a larger economy such as Pakistan and it can benefit from Pakistan's growing geographical importance in the context of the China-Pakistan Economic Corridor (CPEC).

The results mentioned above are, at the macroeconomic level, supported by international trade theories/models such as single market theory, as discussed by Lloyd and Schweinberger (1988), Grinols and Wong (1991), Baldwin and Venables (1995), and Lloyd and Maclaren (2004). In the future, other Pakistani FTAs can be examined to see their impact on different macroeconomic variables.

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Appendix 1: Commodity aggregation in GTAP.9

N0.	Codes	Description	N0	Codes	Description	N0.	Codes	"Description"
"1"	"pdr"	"Paddy rice"	"20"	"omt"	"Meat products"	"39"	"Otn"	"Transport equipment nec"
"2"	"wht"	"Wheat"	"21"	"vol"	"Vege.. oils % fats"	"40"	"Ele"	"Electronic equipment"
"3"	"gro"	"Cereal grains nec"	"22"	"mil"	"Dairy products"	"41"	"Ome"	"Machinery and equipment"
"4"	"v_f"	"Vegetables, fruit, nuts"	"23"	"pcr"	"Processed rice"	"42"	"Omf"	"Manufactures nec"
"5"	"osd"	"Oil seeds"	"24"	"sgr"	"Sugar"	"43"	"Ely"	"Electricity"
"6"	"c_b"	"Sugar cane, sugar beet"	"25"	"ofd"	"Food products"	"44"	"Gdt"	"Gas manufacture, distribution"
"7"	"pfb"	"Plant-based fibers"	"26"	"b_t"	"Beverages and tobacco products"	"45"	"Wtr"	"Water"
"8"	"ocr"	"Crops nec"	"27"	"tex"	"Textiles"	"46"	"Cns"	"Construction"
"9"	"ctl"	"Cattle,sheep ,goats,horses "	"28"	"wap"	"Wearing apparel"	"47"	"Trd"	"Trade"
"10"	"oap"	"Animal products nec"	"29"	"lea"	"Leather products"	"48"	"Otp"	"Transport nec"
"11"	"rmk"	"Raw milk"	"30"	"lum"	"Wood products"	"49"	"Wtp"	"Sea transport"
"12"	"wol"	"Wool, silk-worm cocoons"	"31"	"ppp"	"Paper products, publishing"	"50"	"Atp"	"Air transport"
"13"	"for"	"Forestry"	"32"	"p_c"	"Petroleum, coal products"	"51"	"Cmn"	"Communication"
"14"	"fsh"	"Fishing"	"33"	"crp"	"Chemical, rubber plastic prods"	"52"	"Ofi"	"Financial services nec"
"15"	"col"	"Coal"	"34"	"nmm"	"Mineral products"	"53"	"isr"	"Insurance"
"16"	"oil"	"Oil"	"35"	"i_s"	"Ferrous metals"	"54"	"obs"	"Business services nec"
"17"	"gas"	"Gas"	"36"	"nfm"	"Metals nec"	"55"	"ros"	"Recreation and other services"
"18"	"omn"	"Minerals"	"37"	"fmp"	"Metal products"	"56"	"osg"	"PubAdmin/Defiance/Health/Educat"
"19"	"cmt"	"Meat"	"38"	"mvh"	"Motor. V and parts"	"57"	"dwe"	"Dwellings"

Source: GTAP version.9

Appendix 2: Regional Aggregation in GTAP. 9

No.	Codes	Description	No.	Codes	Description	No.	Codes	Description
"1"	"AUS"	"Australia"	"25"	"LKA"	"Sri Lanka"	"48"	"XCA"	"R.O C. America"
"2"	"NZL"	"New Zealand"	"26"	"XSA"	"R.O. South Asia"	49	DOM	Dominican Republic
"3"	"XOC"	"Rest of Ocean"	"27"	"CAN"	"Canada"	50	JAM	Jamaica
"4"	"CHN"	"China"	"28"	"USA"	"USA"	51	PRI	Puerto Rico
5	HKG	Hong Kong	29	MEX	Mexico	52	TTO	Trinidad & Tobago
6	JPN	Japan	30	XNA	Rest of N. America	53	XCB	Caribbean
7	KOR	Korea Rep. of	31	ARG	Argentina	54	AUT	Austria
8	MNG	Mongolia	32	BOL	Bolivia	55	BEL	Belgium
"9"	"TWN"	"Taiwan"	"33"	"BRA"	"Brazil"	56	CYP	Cyprus
"10"	"XEA"	"Rest E. Asia"	"34"	"CHL"	"Chile"	57	CZE	Czech Republic
11	BRN	B. Darussalam	35	COL	Colombia	58	DNK	Denmark
12	KHM	Cambodia	36	ECU	Ecuador	59	EST	Estonia
13	IDN	Indonesia	37	PRY	Paraguay	60	FIN	Finland
14	LAO	Lao People	38	PER	Peru	61	FRA	France
15	MYS	Malaysia	39	URY	Uruguay	62	DEU	Germany
16	PHL	Philippines	40	VEN	Venezuela	63	GRC	Greece
17	SGP	Singapore	41	XSM	Res. O S. America	64	HUN	Hungary
18	THA	Thailand	42	CRI	Costa Rica	65	IRL	Ireland
19	VNM	Viet Nam	43	GTM	Guatemala	66	ITA	Italy
20	XSE	R.O.S.E. Asia	44	HND	Honduras	67	LVA	Latvia
21	BGD	Bangladesh	45	NIC	Nicaragua	68	LTU	Lithuania
22	IND	India	46	PAN	Panama	69	LUX	Luxembourg
23	NPL	Nepal	47	SLV	El Salvador	70	MLT	Malta
24	PAK	Pakistan	48	LKA	Sri Lanka	71	NLD	Netherlands

Appendix 2. Regional aggregation in GTAP version.9

No.	Codes	Description	No.	Codes	Description	No.	Codes	Description
72	POL	Poland	95	AZE	Azerbaijan	118	NGA	Nigeria
73	PRT	Portugal	96	GEO	Georgia	119	SEN	Senegal
74	SVK	Slovakia	97	BHR	Bahrain	120	TGO	Togo
75	SVN	Slovenia	98	IRN	Iran	121	XWF	Rest of W. Africa
76	ESP	Spain	99	ISR	Israel	122	XCF	Central Africa
77	SWE	Sweden	100	JOR	Jordan	123	XAC	S. Central Africa
78	GBR	U. Kingdom	101	KWT	Kuwait	124	ETH	Ethiopia
79	CHE	Switzerland	102	OMN	Oman	125	KEN	Kenya
80	NOR	Norway	103	QAT	Qatar	126	MDG	Madagascar
81	XEF	Rest of EFTA	104	SAU	Saudi Arabia	127	MWI	Malawi
82	ALB	Albania	105	TUR	Turkey	128	MUS	Mauritius
83	BGR	Bulgaria	106	ARE	UAE	129	MOZ	Mozambique
84	BLR	Belarus	107	XWS	Rest of W. Asia	130	RWA	Rwanda
85	HRV	Croatia	108	EGY	Egypt	131	TZA	Tanzania
86	ROU	Romania	109	MAR	Morocco	132	UGA	Uganda
87	RUS	Russian. Fed	110	TUN	Tunisia	133	ZMB	Zambia
88	UKR	Ukraine	111	XNF	Rest of North Africa	134	ZWE	Zimbabwe
89	XEE	R.O E. Europe	112	BEN	Benin	135	XEC	Rest of E. Africa
"90"	"XER"	"Rest of Europe"	"113"	"BFA"	"Burkina Faso"	"136"	"BWA"	"Botswana"
91	KAZ	Kazakhstan	114	CMR	Cameroon	137	NAM	Namibia
92	KGZ	Kyrgyzstan	115	CIV	Cote d'Ivoire	138	ZAF	South Africa
93	XSU	R.O. F. Sov. U	116	GHA	Ghana	139	XSC	Rest of S. Afric..
94	ARM	Armenia	117	GIN	Guinea	140	XTW	Rest of World

Source: GTAP version.9

Appendix 3: Harmonized System (HS) 6 codes used in the Simulation"

Simulated Sectoral Effects of the Pakistan Sri Lanka FTA on Pakistan (% change) Table# 4.3"

Pakistani major exports to Sri Lanka are **Beverages and Tobacco** includes the item of HS-6 digit is Undenaturd ethyl alcohol of an alcohol (HS-220710). **Textile sector** items of HS-6 digit are Plain weave cotton fabric, unbleached (HS-520911), Denim fabrics of cotton (HS-520942), Dyed cotton fabrics, knitted or crocheted (HS-600622), Twill weave cotton fabrics (HS-520932), Twill weave cotton fabrics printed (HS-520952), Denim fabrics of cotton (HS-521142), Cotton sewg thread cotton, not put up for retail sale (HS-520411), Plain weave cotton fabric (HS-521031), Woven fabrics of cotton nes (HS-520839), Twill weave cotton fabric unbleached (HS-520912), Woven fabric of cotton (HS-521019), Plain weave cotton fabric unbleached (HS-520811), Bed linen, of textile knitted or crocheted materials (HS-630210), Woven fabrics of cotton (HS-521211), Cotton yarn (HS-520533), Plain weave cotton fabrics (HS-520931), Woven fabrics of cotton, printed, nes (HS-520959), Twill weave cotton fabrics, bleached (HS-520922),Twill weave cotton fabric, unbleached (HS-520813), Plain weave polyester staple fib fabric, printed (HS-551341), Plain weave cotton fabric, unbleached (HS-520812), Woven fabrics of cotton, dyed, nes (HS-521223). **Wearing apparel** includes Men/boys garments nes, of cotton, not knitted (HS-621132). **Ferrous metals** of HS-6 digit such as Tubes, pipe & hollow profiles, iron or steel, welded, nes (HS-730690). **processed rice** consist of Rice, broken (HS- 100640), **vegetable, fruits and nuts** comprise of Mandarins (tang& sats) clementines &wilkgs &sim citrus hybrids, fresh/drid (HS-080520) and **mineral products nec** comprise of Portland cement nes (HS-252329), Float glass etc in sheets, non-wired nes (HS-700529), Hydraulic cement nes (HS-252390)."

"Simulated Sectoral Effects of the Pakistan Sri Lanka FTA on Sri Lanka (% change) - Table # 4.4"

Sri Lanka's major exports to Pakistan are **Vegetable oil & fats** includes Coconut (copra) oil &its fractions refined but not chemically modified (HS-151319) and **wood products** comprise of Medium density fiber board MDF of wood, of a thickness (HS-441112), Medium density fiber board MDF of wood, of a thickness (HS-441114), Medium density fiber board MDF of wood, of a thickness (HS- 441113)."