ASSESSING THE ECONOMIC IMPACTS AND WELFARE IMPLICATIONS OF SAFTA AND SAFTA+3+2: THE SOUTH ASIAN EXPERIENCE

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ABSTRACT

This paper employs an Applied General Equilibrium Model and the GTAP6 Database to evaluate the economic impacts and welfare implications of South Asian Free Trade Area (SAFTA) and Free Trade Agreements (FTAs) of SAARC countries at both intra- and inter-regional dimensions linking three East Asian nations of China, Japan and South Korea (coded as 3), and the western nations of the United States and the EU (coded as 2). Findings demonstrate that the largest welfare gains materialize from the plurilateral FTA with complete liberalization in all sectors. While the maximum possible FTAs emerge from varying tariff combinations, results corroborate that selective tariff combinations is welfare enhancing for both contracting parties generating maximum feasible FTAs amongst SAARC and 3+2 countries. There is also clear evidence showing that SAFTA and SAFTA+3+2 are welfare enhancing, resulting in net trade creation as opposed to trade diversion. Albeit major fluctuations are observed in the industry output, other economic variables such as household demand, aggregate exports and imports, terms of trade, GDP, and allocative efficiencies of SAARC as well as 3+2 countries increase significantly apropos SAFTA+3+2 scenario in particular.

JEL Classification: C15, C68, F17

Keywords: SAARC, SAFTA, FTA, GTAP, tariffs, welfare

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1. INTRODUCTION

The issue of free trade and economic integration is a subject of avid interest in the arena of international trade and politics today. Emulating the regional trade blocs in Europe and the Americas, the movement towards bilateralism and regionalism is gaining momentum even in South Asia and East Asia in the last decade with the unfolding of numerous trade agreements signed one after another based upon reciprocity (ADB, 2006; Harrigan et al., 2006). This is perhaps the reason why Asami (2005, p. 7) reckons that regional integration is "inevitable as globalization becomes the order of the day." In fact, the headlong rush for bilateralism, regionalism, and free trade during the last decade has ushered a new era in the global trading system. To all intents and purposes, regional trading agreements (RTAs) have become one of the major international developments in recent times, which commonly take the form of bilateral trade agreements (BTAs), preferential trading arrangements (PTAs), free trade agreements (FTAs), customs unions, common market, economic union, or such agreements leading to one or the other. BTAs, PTAs and FTAs in particular are assuming a prominent role for economic integration in the developing region of South Asia.

South Asian Association for Regional Cooperation (SAARC) was established in 1985 when the seven nations of South Asia comprising Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka teamed up for a common purpose of reducing poverty, strengthening regional cooperation and accelerating economic growth in the region. A first step towards fulfilling this aspiration transpired when South Asian Preferential Trading Arrangement (SAPTA) became operational in 1995. Subsequently, on January 1, 2006, South Asian Free Trade Area (SAFTA) was ratified creating a framework for establishment of a free trade area covering over 1.5 billion people. Under the Agreement, member states of the SAARC bloc have concurred to bring their tariffs down to 0-5% by 2016. What is more, five Observer countries, viz., China, Japan, South Korea, the United States, and the European Union (EU) have lately been showing keen interest in associating with this region. Japan and the EU have already started negotiations for bilateral FTA

with India, while China is in the queue. These developing issues provide incentive for us to ask some fundamental questions such as: (1) What are the economic effects of SAFTA on trade flows as a result of the reduction in tariffs given the present economic structures of SAARC countries and varied levels of development? (2) What will be the welfare implications of FTA between the SAFTA members and the Observers that can integrate the North and the South? (3) Which of the contracting parties are likely to have potential welfare benefits and most feasible FTAs?

The motivation for this study emerges from the fact that regional integration and free trade is one of the most important building blocks for economic growth in the region. The main objective of this paper is therefore to evaluate the economic impacts and welfare implications of SAFTA amongst the member states as well as FTAs of SAARC nations with three East Asian giants, i.e., China, Japan and South Korea (henceforth coded as "3"), and the two big players of the West, the United States and the EU (henceforth coded as "2"). The first hypothesis we test is whether the compensation by means of preferential tariff concessions from the winners to losers will ensure all countries to gain from FTAs. In other words, selective combinations of tariff rates are expected to result in welfare gains of both the contracting parties. The second hypothesis to be tested is whether or not SAFTA and FTAs with the aforementioned Observer countries (henceforth coded as "3+2") will be welfare improving to SAARC member countries causing trade creation. In order to do so, we employ the Global Trade Analysis Project (GTAP) model – a multiregion, multisector Applied General Equilibrium (AGE) [1] model based on perfect competition and constant returns to scale.

The remainder of the paper is organized as follows. Section 2 provides the theoretical considerations on free trade encompassing various forms of trade integration tools, and the momentum for broader economic agenda in South Asia. The methodology, model calibration, the data and aggregation are discussed in Section 3. Section 4 presents the simulation scenarios and welfare experimentation model, while Section 5 evaluates several bilateral and plurilateral FTA options for SAARC countries with 3+2 countries. Section 6 outlines the findings and concludes.

2. SOME ISSUES ON FREE TRADE AND WELFARE

2.1. Bilateralism, Plurilateralism, or Multilateralism?

Bilateralism comprises the political, economic and cultural relations between two states, while regionalism constitutes more than two sates that express a particular identity and shape collective action within a geographical region. Plurilateralism, on the other hand is in "between bilateralism and multilateralism, and indicates a policy of three or more countries concluding a regional economic agreement, and promoting trade liberalization" (Oyane, 2001, p. 9). Plurilateral agreements are the contractual agreements that are made in between the states and/or blocs of diverse geographic regions. Plurilateralism has the possibility of enabling relatively simple negotiations between multiple countries with common interests, and expanding in a domino effect the resultant liberalization (U.S. Council of Economic Advisers, 1995). Among the many trade agreements in the world, plurilateral agreements are one of the most important developments witnessing some of the historical moments in international trade. Without restricting to any particular region of the world, plurilateral agreements have made its mark all over the world. Two of the major agreements comprise Middle East Free Trade Area (US-MEFTA) and Euro-Mediterranean free trade area (EU-MEFTA). Multilateralism, on the other hand, is a term in international relations that refers to multiple countries working in concert on a given issue.[2] Good examples are the United Nations (UN) and the World Trade Organization (WTO).

However, the fad for free trade and economic integration is already questioning the virtues of bilateral versus multilateral trading system. Proponents have their own set of arguments for favoring their respective positions. Raihan and Razzaque (2007, p. 17) argue that bilateralism is trade-creating because countries can "lock-in" reforms via bilateral FTAs or RTAs,[3] which is often politically not executable under multilateralism. Moreover, multilateral trade talks are much more complex while trade liberalization can take place more easily through bilateral talks, since bilateral agreements have greater flexibilities and ease that is lacking in most compromise-dependent multilateral systems. Khor (2006) argues that multilateralism tends to have a systematic

bias toward rich countries and multinational corporations, harming smaller countries which have less negotiation power. On the flip side, critics allege that bilateral FTAs undermine the spirit of multilateralism. They affirm that there is a possibility of the discrimination against the excluded countries, and too much involvement in bilateral negotiations may distract attention from multilateral liberalization; the world then might be divided into a few protectionist blocs, further strengthening the opposition to multilateral liberalization. Furthermore, the "spaghetti bowl" phenomenon as propounded by Bhagwati (2005, p. 28) can emerge because of the traversing of simultaneous bilateral trade negotiations.

Nonetheless, Burfisher and Zahniser (2003) maintain that a country need not necessarily follow stringent single policy towards liberalization in a fundamentally globalized world. Dual trade reforms involving bilateral and plurilateral trading arrangements form the best possible options for taking full advanatage of liberalized economies. Multilateralism is clearly beneficial in that it engages virtually every country in the world in a mutual process of trade reform. In contrast, while the bilateral and plurilateral are exclusive and discriminatory, but they are capable of much deeper trade reforms since their adherents are fewer, more like-minded and committed, and often linked geographically and historically.

2.2. Free Trade and National Welfare

Hudgins (1996: 231) contends that all forms of trade liberalization are "valid means" to opening world markets. Each of the channels has a specific role for free trade and they should not be discarded without a good reason. Low (2004, p. 2) asserts that "free trade remains the first best trade policy." Indeed, everyone stands to gain from free trade, either through the mechanics involving economies of scale, or offering more opportunities for learning and innovation (Caves et al., 2007; Krugman and Obstfeld, 2003). Even critics concede, in general, that freer trade through bilateral or regional trade liberalization improves the welfare of countries by promoting wealth creation. But under some conditions, opening markets with only selected trading partners could become a conduit for trade diversion (Weintraub, 1996).

Brown et al. (2003) point to the fact that separate bilateral FTAs have positive, but generally small welfare effects on the partner countries, and potentially disruptive sectoral employment shifts in some countries. They argue that regional agreements such as an APEC, an ASEAN+3, and a Western Hemisphere FTA would increase global and member country welfare, but much less so than the multilateral trading organization, such as the WTO would. While they also detect evidence of trade diversion and detrimental welfare effects on some non-member countries in the case of PTAs, the welfare gains from multilateral trade liberalization are found to be considerably greater and uniformly positive for all countries. Hoekman and Winters (2007, p. 1) note that "the lower are MFN tariffs and the less there is discrimination, the better off is the world as a whole."

A global scale multilateral trade framework may have an advantage in terms of resource allocation, economic welfare and economic prosperity in theory, however, the next best framework has always been the bilateral, or plurilateral agreements, which enables lowering of trade barriers amongst members without having to lower barriers for the non-members. Bilateral FTAs and plurilaterl RTAs also prevail over multilateral framework like the WTO in terms of dealing with difficult trade problems, as the WTO normally must cater to the lowest common policy denominator (Hudgins, 1996). All in all, there is a general consensus amongst trade analysts on the existence of a similar relationship between these arrangements. In so far as bilateral/regional, plurilateral and multilateral trade liberalizations are concerned, they are all complementary means to opening world markets, and to ultimately achieving the goal of greater national welfare and economic liberty (Doshi, 2008).

2.3. SAFTA and Broader Economic Agenda

The worldwide proliferation of PTAs and successful implementation of India's bilateral FTA with Nepal, Bhutan and Sri Lanka was somehow the precursor that led to the signing of the SAFTA on January 6, 2004, which was eventually ratified on January 1, 2006 (see Baysan et al., 2006; Mohanty, 2003). The SAFTA framework covers tariff reductions, rules of origin (ROO), safeguards, institutional structures, and dispute settlement. It also calls for the adoption of various

trade facilitation measures, such as harmonization of standards and mutual recognition of test results, harmonization of customs procedures, and cooperation in improving transport infrastructure. These measures are expected to help significantly reduce the cost of international trade, especially regional trade. The SAFTA trade liberalization process will take 10 years to complete. However, this extended timeline of the SAFTA Agreement is viewed by some analysts to weaken SAFTA's impact if other trading arrangements supersede it (Batra, 2005).

The tariff reduction by non-LDCs (India, Pakistan, and Sri Lanka) to LDCs (Bangladesh, Bhutan, Nepal, and Maldives) would be completed in two phases: In Phase I (1/1/2006 – 31/12/2007), the existing tariff rates above 20% is to be reduced to 20% within two years, and tariff below 20% is to be reduced on margin of preference basis of 10% on actual tariff rates for each of the two years. Phase II (1/1/2008 – 31/12/2012) requires tariffs to be reduced to 0-5% within 5 years; Sri Lanka is given six years. The tariff reduction by LDCs would also be completed in two phases as well. In Phase I (1/1/2006 – 31/12/2007), the existing tariff rates above 30% will be reduced to 30% within two years and tariff below 30% to be reduced on margin of preference basis of 5% for each of the two years. In Phase II (1/1/2008 – 31/12/2015), tariffs will be reduced to 0-5% in equal installments, but not less than 10% annually (see SAFTA, 2004).

So far, only few studies that have quite lately attempted to examine the welfare effects of SAFTA. These studies have demonstrated mixed results. For instance, Baysan et al. (2006) surmise the economic case for SAFTA as rather weak due to small economic size of SAARC countries vis-à-vis rest of the world, prevalence of high levels of tariff and para-tariff protections, and sectoral exclusions and stringent ROO. In contrast, Rodríguez-Delgado (2007) shows that SAFTA can provide the highest increase for SAARC countries in terms of trade flows they could expect from any RTAs. Others like Raihan and Razzaque (2007) conclude that a full implementation of SAFTA will lead to welfare gains for all South Asian countries, with the

exception of Bangladesh. Such conflicting arguments call for the need to re-examine the economic impacts of the SAFTA.

Intent on their quest for a greater liberalization, proponents of regionalism are now proposing for a broader Asian Economic Community (AEC) in the offing, encompassing ASEAN+3, ASEAN+4, ASEAN+6, and/or East Asian Summit (EAS) countries (see Kumar, 2005; Mohanty and Pohit, 2007). Thus, this provides further impetus for us to look into an additional alternative, i.e., the impact of much broader integration of South Asia with 3+2 countries – linking South Asia to the Far East and further to the West. SAFTA+3+2 is, therefore, expected to have an integration potential much more across-the-board with membership open to some of the most influential economies in the world, and more so by way of economic mass and geographical coverage.

3. METHODOLOGY AND DATA

3.1. The GTAP Model and the AGE Framework

Despite some skepticism surrounding large-scale modeling efforts of the Global Trade Analysis Project (GTAP) Model, several researchers in the area of international trade and development are ardent users of the GTAP Model today because the database accompanying the GTAP Model is well suited to analyze the consequences of a free trade area (see Gehlhar, 1997; Young and Huff, 1997). In fact, a multiregion AGE approach has a number of advantages over partial equilibrium in that the model not only allows for endogenous movements of regional prices and quantities in response of technological change but also provides a consistent framework that "avoid pitfalls of under- or overcounting welfare effects in a multimarket setting" amongst others (Frisvold, 1997, p. 324).

The GTAP Model employed in this paper covers 57 industrial sectors including agriculture, manufactures and services in 87 countries/regions. It handles the bilateral trade via Armington assumption (see GTAP, 2005). The basic innovations of this model include the treatment of private household preferences using the non-homothetic Constant Difference of Elasticities (CDE)

functional form, explicit international trade and transport margins, and a global banking sector that links global savings and investment. It also allows users a wide range of closure options, including a selection of partial equilibrium closures that facilitate comparison of results to studies based on partial equilibrium assumptions (see Hertel 1997; Hertel and Tsigas 1997).

The model integrates and incorporates a macro framework of the multiregion open economy model using a wide set of variables, parameters, and equations (see Swaminathan 1997). In contrast to the closed economy, the multiregion model includes separate conditional demand equations for domestic and imported intermediate inputs. The savings and investment are computed on a global basis, so that all savers in the model face a common price for this savings commodity. This implies that if all markets in the multiregional model are in equilibrium, all firms earn zero profits, and all households are on their budget constraint, then global investment must equal global savings to satisfy the Walras' Law (Brockmeier, 2001).

As in the Michigan Model applied by Brown et al. (2003) that incorporates some aspects of the New Trade Theory including increasing returns to scale, monopolistic competition, and product variety, the GTAP Model operates in much the similar way and the database is formulated and solved using the General Equilibrium Modeling Package (GEMPACK) software as illustrated in Harrison and Pearson (1996). Besides, capital and labor are assumed to be mobile across economic sectors with the assumption of full employment. The labor component is divided into skilled and unskilled labor, which is combined in a Constant Elasticity of Substitution (CES) function to form a composite labor input, and sectoral output is a CES function of capital and composite labor. The model has been extended in line with the GTAP world model developed by Hertel and Tsigas (1997) to allow for a greater regional and sectoral disaggregation and more detailed treatment of taxes and subsidies.

3.2. Model Calibration and Aggregation Strategy

To estimate and simulate the effects of FTA, we develop two scenarios: a base scenario with unaltered trade policies, and a free trade scenario amongst SAARC countries (SAFTA effects) as

well as FTAs with the Observer countries (SAFTA+3+2 effects). SAFTA, in this context, stands for those SAARC countries who are signatories to SAFTA Agreement. The descriptor code "3" is assigned for China, Japan and South Korea in the East Asia region. Likewise, "2" is assigned for the United States and the EU in the West. The model evaluates the effects of both plurilateral and bilateral FTAs so as to precisely contrast the extent of these effects quantitatively. The model takes into account the cross-sectional data from a single base period, and imposes a detailed theoretical structure on the interactions amongst different data elements. Using certain constraining assumptions, the model is exploited by changing the shocks and observing how the remaining variables adjust. This is a comparative-static model that can be effectivley used to analyze the reactions of the economy at a point in time. The results show the difference (usually reported in percent change form) between two alternative future states, with and without the policy shock.

From 87 regions and 57 sectors, the GTAP dataset for this model is aggregated down to 10 regions and 20 sectors, respectively (see Table 1). We separate individual country/region to the extent possible so as to distinguish the welfare and trade effects of policy changes by country/region and sectors based on similarities in factor shares and characteristics. The regional analysis largely focuses on the SAARC countries. The five primary factors include land, unskilled labor, skilled labor, capital, and natural resources. The aggregations are set up with a view to test five major effects under a number of different scenarios/experiments: (1) Effects of plurilateral FTA amongst SAARC countries, (2) Effects of bilateral FTAs amongst SAARC countries; (3) Effects of plurilateral FTAs of SAARC members as a single entity with 3+2; (4) Effects of bilateral FTAs of SAARC members as a single entity with 3+2; and (5) Effects of bilateral FTAs of individual SAARC countries with 3+2.

Table 1. Regional and Sectoral Aggregation

	Region Code	Description		Sector Code	Description
1	BGD	Bangladesh	1	Crops	Food and agriculture products
2	IND	India	2	Livestock	Farm animals and products
3	LKA	Sri Lanka	3	Dairy	Dairy and meat products
4	RSA	Rest of South Asia	4	Forestry	Forestry and logging
5	CHN	China	5	Fishing	Fishing and related activities
6	JPN	Japan	6	Mining	Mining and extraction
7	KOR	South Korea	7	Beverages	Beverages and tobacco products
8	USA	United Sates of America	8	Manufactures	Manufactures and recycling
9	EU	European Union 27	9	Textiles	Textiles and clothing
10	ROW	Rest of the World	10	Leather	Leather tanning and products
			11	Chemical	Chemical and mineral products
			12	Automobile	Automobiles and spares
			13	Metals	Metals and metal products
			14	Electronics	Office equipment and apparatus
			15	Machinery	Machinery and equipment
			16	Utility	Basic utilities
			17	Trade	Retail and wholesale trade
			18	Transport	Transport and communication
			19	Construction	Construction works
			20	Services	Other services

Source: GTAP6 Database.

3.3. Import Tariff and Export Subsidy

Our analysis lays special focus on the reduction of import tariffs and export subsidies mainly because these are the two most important protection measures (available in quantifiable terms) that influence trade in South Asia to a large extent.[4] Table 2 provides an overview of the average import tariffs levied by SAARC, 3+2 and rest of the world (ROW) by source. The average import tax imposed amongst the SAARC countries is 21.7%. Japan, USA, EU and ROW impose well below 10%. As regards the export subsidies, the EU and the US provide a fairly significant amount of subsidies to the agriculture sector, viz., crops, dairy and livestock. As such, these subsidies have a bearing in our simulations.

Table 2. Import Tariffs by Source (mean % ad valorem rate)

S/N	Code	Country/Region	Import Tariffs
1	BGD	Bangladesh	19.4
2	IND	India	31.9
3	LKA	Sri Lanka	14.5
4	RSA	Rest of South Asia	20.9
5	CHN	China	16.5
6	JPN	Japan	8.7
7	KOR	South Korea	14.7
8	USA	United Sates of America	2.8
9	EU	European Union 27	4.4
10	ROW	Rest of the World	9.2

Source: Author's calculation based on GTAP6 Database.

3.4. Data Source

The GTAP6 Aggregate Package (GTAPAgg6) is the main source of the data for simulations. The full GTAPAgg6 covers 87 countries or regions, 57 commodities or sectors, and five primary sectors. The database corresponds to the world economy based on 2001 benchmark. The GTAPAgg6 helps prepare an aggregation scheme and then uses the scheme to prepare an aggregated database for the GTAP economic model. The RunGTAP software program, Version 3.40 is used to run the general equilibrium simulations, which is designed to work with Version 6.2 of the GTAP Model and the GTAP6 Database. The RunGTAP is a visual interface to the GTAP Model. It supports various versions of GTAP which are distinguished chiefly by level of aggregation. It incorporates a detailed treatment of international trade margins and other enhancements (see GTAP, 2005).

4. SIMULATION SCENARIOS AND EXPERIMENTAL DESIGN

As aforementioned, experiments are based on 10 regions and 20 sectors model using a full multiregion general equilibrium closure. Simulations are designed in such a way so as to capture the effects of SAFTA as well as FTAs with 3+2 both in terms of intra-regional and inter-regional dimensions. Experiments are carried out exhaustively and encompass all major integration options. The experiments are novel in two respects. First, for each set of simulation scenario, experiments are performed in three stages by applying fixed, equal, and varying tariff combinations. Second, each group of experiments is meticulously arranged with the aim of creating FTA negotiation scenarios as closer to reality as possible. The tariffs is ultimately lowered down to 0-5% in equal annual installments in keeping with the objective of the SAFTA tariff reduction schedule, setting the highest tariffs at 30% for LDCs and 20% for non-LDCs.

For example, under the plurilateral FTA, the first stage experiments starts from 10%, 5%, and then 0%, fixed tariffs on all traded commodities by all contracting parties. The second stage experiments consist of tariff combinations of 10%, 5%, 0% as well, but they are levied equally by

both the contracting parties for a maximum of three most protected sectors. The third stage experiments consider removal of protections in different combinations (e.g., 30%-20%, 10%-5%, and 5%-0%), selecting up to three sectors with the highest tariff rates. Wherever the tariff rates of LDCs are already below 30%, it starts from 20%; and where the non-LDCs/developed countries' tariff rates are already below 20%, the next level starts from 10% or below, depending upon the case. The benefit of doing this is that this technique partly reflects an actual negotiation process, and in addition, we can find out whether the preferential treatment, i.e., compensation by way of tariff concessions offered by non-LDCs/developed countries to LDCs/developing countries can be welfare enhancing to the contracting parties. In other words, we test whether the lowering down or complete removal tariffs from the most protected sectors will be welfare improving to the countries involved. Thus, tariff combinations are designed on a case-by-case basis depending upon results of previous experiments. The final objective is to find the best possible tariff combinations for most viable FTAs, and also with a view to testing our two hypotheses: whether or not compensation scheme from winners to losers will ensure all countries to gain from FTAs; and to see if FTAs of SAARC countries with 3+2 will be welfare improving causing more trade creation than trade diversion.

5. SIMULATION RESULTS

5.1. Effects of SAFTA

The results of the simulations for plurilateral as well as bilateral FTAs amongst SAARC countries are discussed below.[5] These results estimate the welfare effects of the SAFTA is given by the Equivalent Variation (EV). The EV is the amount or percentage of additional income that consumers require to achieve the post-simulation level of utility given pre-simulation price level. A positive value indicates welfare improvement and a negative value denotes welfare deterioration.[6]

Welfare Gains and Losses

Applying a fixed tariff option in the case of plurilateral FTA amongst SAARC countries, the experiments show that Bangladesh is the biggest loser, whereas India and RSA are the largest gainers. All other countries including ROW face a welfare loss. As regards the bilateral FTA amongst SAARC countries, India gains considerably by means of BDG-IND FTA. Further reduction of tariffs increases welfare for India and vice-versa for others. BDG-LKA FTA brings gains only to Sri Lanka, while BDG-RSA FTA brings exclusive gains to RSA. IND-LKA FTA generates welfare gains to both the countries. In terms of IND-RSA FTA, both India and RSA gain significantly at tariff rates of 10% or 5%, but India faces a welfare loss at 0%. Except for China, all others lose. Finally, the LKA-RSA FTA shows that both Sri Lanka and RSA gain as tariff is further reduced.

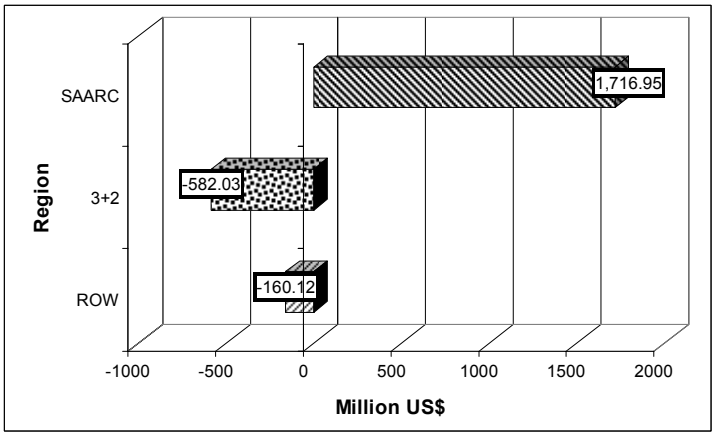
In the second stage simulations, using equal tariff combinations, Bangladesh is again the biggest loser, but the losses are smaller. India, despite being the winner, does not gain as much as in the first stage. RSA reigns as the biggest winner though. Amongst 3+2, most of them lose with the exception of China. As regards the bilateral FTAs, welfare improves for India, Sri Lanka and RSA, while it declines for Bangladesh. Concurrently, the welfare of China, Japan, the United States and the EU also improves.

In order to find the best possible combinations so as to make Bangladesh better off, a third set of experiments with varying tariff combinations are performed. This time, the LDCs (Bangladesh and RSA) impose a fixed tax rate of 30% to non-LDCs (India and Sri Lanka), while the LDCs impose tax at a descending order of 20%, 5% and 0%. Interestingly, the experiment with 30%-20% tariff combination results in gains for all SAARC countries except for Sri Lanka; while all non-members become worse off except for China. When the tax rate is lowered down to 10%-5%, Bangladesh becomes worse off than Sri Lanka. All non-members become worse off too. Lowering further down to 5%-0% is not an optimal combination, as only India and RSA gains.

From the above experiments, we may deduce that with the right combination of tariffs, FTA improves welfare of both the contracting parties. A good example is the case of LKA-RSA FTA. Overall, this provides a good support for our hypothesis number one.

Figure 2 provides the results of the bilateral SAFTA effects. Clearly, the welfare of SAARC countries' increase substantially, which accounts for over US$1.7 billion. It appears that both 3+2 and ROW incurs a net welfare loss of about US$582 and US$160 million, respectively. This means that the feasible tariff combinations amongst SAARC countries would help increase trade flows substantially within the bloc. The welfare loss for 3+2 and ROW can be explained by the fact that SAARC's imports from 3+2 and ROW are diverted, as SAARC members increase their trade within the bloc.

Figure 2. Welfare Gains and Losses
(Bilateral: amongst SAARC)



Trade Creation and Trade Diversion Effects

Next, we discuss the changes in export sales in 20 sectors of Bangladesh, India, Sri Lanka, RSA, China, Japan, South Korea, the United States, the EU, and ROW under the plurilateral SAFTA.[7] First, we take a look in India's import changes in the crops sector. India increases its import of crops by US$182.69 million from Bangladesh, US$114.98 million from Sri Lanka, and US$209.06 from RSA. The total increase in imports of crops accounts for $US506.73 million. On the contrary, India decreases its import of crops by US$2.51 million from China, US$11 million from Japan, US$2.79 million from South Korea, US$16.04 million from USA, US$19.91 million from the EU, and US$43.20 million from ROW, which sums up to US$81.94 million. The difference between the increase in trade volume of crops (U$506.73) and a decrease in trade volume of crops (US$81.94) is the trade creation effect as a result of the SAFTA, which is equivalent to US$ 424.79 million.

Similarly, RSA also increases its total trade volume with Bangladesh accounting for US$413.13 million, with India US$2,005.39 million, and with Sri Lanka US$40.08 million. At the same time, RSA decreases its trade with other RSA members accounting for US$23.47 million, with China US$82.90 million, Japan US$58.80 million, South Korea US$49.09 million, the United States US$482.46 million, EU US$485.35 million, and ROW US$547.45 million. The net trade creation effect is US$729.08 million (2,458.60 – 1,729.52). This indicates that there is a significant trade creation effect particularly amongst the SAARC members under the SAFTA scenario.

In so far as the non-members are concerned, China decreases its trade with SAARC members and increases its trade with the outside world. For instance, China decreases its trade with Bangladesh by US$219.42, with India by US$27.50, with Sri Lanka by US$10.26, and with RSA by US$15.88. Therefore, the total decrease in trade volume of China's trade with the SAARC members adds up to US$273.06 million. This decrease represents the trade that is diverted away from the SAARC region as a result of the SAFTA, and so it is termed as the trade diversion effect.

Changes in Industry Output, Private Household Demand, Aggregate Exports and Aggregate Imports

The launching of SAFTA has major impacts on industry's output, household demand and exports and imports of seven SAARC countries. The industry output of SAARC countries shifts significantly under the SAFTA scenario. Bangladesh's agriculture and service industries shrink, while the manufacturing sector expands. Both India and Sri Lanka's manufacturing and service sector expands but their agriculture sector declines. The case of RSA is just the reverse: agriculture sector expands while the manufacturing and service sectors decline. As expected, not much impact is observed as far as the non-members are concerned. Considering the resource endowments of each of the countries, the changes in the pattern of production are not surprising. Bangladesh, India, and Sri Lanka are continuously moving away from the traditional agriculture to more broad-based growth in the manufacturing sector. For example, the SAFTA scenario

expands Bangladesh's textile sector by US$498 million. Likewise, India emerges as the major supplier of chemical (US$346.7 million), automobile (425.6 million) and machinery (381.5 million). Agriculture still stands as a dominant sector for the RSA.

Whereas the private household demand is concerned, the demand for both agriculture and manufactured products in all SAARC countries increases. There is a rise in demand for services especially in India, Sri Lanka and RSA save for Bangladesh; but there is a decline in demand for all non-members. Aggregate exports and imports in agriculture and manufacturing sectors increase in all SAARC countries, while the reverse is true for the non-members.

Changes in Terms of Trade, GDP Indices, and Allocative Efficiency

Table 3 shows the changes in terms of trade, GDP indices, and allocative efficiency. The results show that SAFTA has positive effects on the terms of trade and GDP price indices of India, Sri Lanka and RSA, while it has negative effects on Bangladesh and the non-members. The results for Bangladesh is consistent with the study by Raihan and Razzaque (2007), wherein they find that Bangladesh incurs a net welfare loss because the positive trade creation effect is not large enough to offset for the negative trade diversion effect. India experiences the largest gains in terms of GDP as well as allocative efficiency followed by RSA. This supports the argument that an FTA is beneficial to member countries, but detrimental to non-member countries. Non-members are at a disadvantage as a result of the trade diversion effect.

Table 3. Changes in Terms of Trade, GDP Indices, and Allocative Efficiency

Countries	Δ in Terms of Trade (%)	Δ GDP Price Index (%)	Δ in GDP Quantity Index (US$ million)	Allocative Efficiency (Regional EV)
BDG	-1.22	-0.86	-112.69	-112.47
IND	0.28	0.34	166.41	166.41
LKA	0.92	1.12	21.23	21.24
RSA	2.47	2.99	72.66	72.69
CHN	-0.01	-0.02	6.38	6.37
JPN	-0.01	-0.03	-6.25	-6.29
KOR	-0.02	-0.04	-10.78	-10.80
USA	-0.01	-0.02	-14.00	-13.53
EU	0.00	-0.02	-14.00	-14.24
ROW	-0.01	-0.02	-59.50	-59.27

Note: The change in terms of trade (2nd column) and GDP price index (3rd column) are compared to the base scenario fixed at 1 vis-à-vis the value of the post simulation under the FTA scenario.

Table 4 shows the changes in trade balance and allocative efficiency in three major sectors of agriculture, manufacturing and services. There are major fluctuations in trade balances of India and Sri Lanka as a result of major shuffling in their industry output patterns. However, the allocative efficiencies of both the economies increase in all three sectors. As for the non-members, there is not much impact except for a growth in the trade balances of the EU and ROW in the service sector.

Table 4. Changes in Trade Balance and Allocative Efficiency Effect

Change in Trade Balance (US$ million)										
Sector	**BDG**	**IND**	**LKA**	**RSA**	**CHN**	**JPN**	**KOR**	**USA**	**EU**	**ROW**
Agriculture	-91.18	-483.19	-57.20	434.07	15.91	26.34	10.46	5.09	36.16	-15.32
Manufacturing	-62.05	420.69	14.34	-442.14	-25.96	40.67	-36.92	162.77	-96.04	-87.65
Services	5.84	-254.15	-54.76	-295.83	24.09	84.02	34.08	118.40	283.98	285.56
Allocative Efficiency Effect: Commodity Summary										
Sector	**BDG**	**IND**	**LKA**	**RSA**	**CHN**	**JPN**	**KOR**	**USA**	**EU**	**ROW**
Agriculture	-7.02	101.63	7.75	42.06	1.11	-0.16	-4.68	0.12	-0.56	-8.77
Manufacturing	-105.72	57.72	10.72	27.85	4.92	-0.26	-6.15	-13.66	5.41	-48.49
Services	0.26	7.07	2.77	2.80	0.36	-5.79	0.04	0.02	-14.86	-1.65

Viable FTAs amongst SAARC Countries

Table 5 illustrates the most viable FTAs amongst SAARC members. IND-LKA FTA will be most viable within the framework of fixed as well varying tariff rates. IND-RSA FTA is the most flexible of all, since this FTA would be possible in the case of fixed, equal and varying tariff combinations. There is a good prospect for BDG-IND FTA, but only at the varying tariff rates of 30%-20%. This may be explained by the fact that Bangladesh's exports base is still very narrow vis-à-vis India, and more so being strongly dominated by India's diversified trade pattern in the region. This also implies that further reduction of tariffs from this level would likely undercut protected industries in Bangladesh, such as textiles and leather by Indian producers with similar line of goods. Sri Lanka and RSA could have a successful FTA at varying rates within the range of 0-10%. Overall, our hypothesis is further underpinned by the fact that there are maximum possible combinations available for successful FTAs at varying tariff combinations.[8]

Table 5. Viable FTAs under SAFTA Scenario*

S/N	Bilateral FTA		Tariffs % combination		
	Simulation No.	Contracting Countries	Fixed	Equal	Varying
1	S4c	IND-LKA	0-0		
2	S5a	IND-RSA	10-10		
3	S5b	IND-RSA	5-5		
4	S11a	IND-RSA		10-10	
5	S11b	IND-RSA		5-5	
6	S11c	IND-RSA		0-0	
7	S12a	LKA-RSA		10-10	
8	S13a	BDG-IND			30-20
9	S15a	BDG-RSA			20-15
10	S16a	IND-LKA			10-15
11	S17a	IND-RSA			20-30
12	S17b	IND-RSA			5-10
13	S17c	IND-RSA			0-5
14	S18b	LKA-RSA			10-5
15	S18c	LKA-RSA			5-0

Notes: *Viable FTA refers to the FTA scenario that provides welfare gains to both/all the contracting parties at the tariff level as stipulated under the SAFTA Agreement. Fixed: tariffs are fixed for all traded sectors; Equal: tariffs are fixed equally but only for the maximum of three protected sectors; and Varying: tariffs vary for maximum of three protected sectors based on SAFTA tariff reduction schedule and on individual country's development and trade peculiarities.

5.2. Effects of SAFTA+3+2

Welfare Gains and Losses

The results for SAFTA+3+2 scenario in the case of plurilateral and bilateral FTAs are as follows. Under the plurilateral FTA for SAARC taken as single entity, the results show that except for South Korea and ROW, all others lose. The tariff combination at fixed 10% for all traded commodities is certainly not a feasible proposition, and hence will not be acceptable to the losers. Subsequent experiments show significant gains to 3+2, but SAARC loses. Under the bilateral FTA between SAARC and CHN, SAARC loses. Similarly, SAARC-JPN FTA and SAARC-KOR FTA brings significant welfare gains to Japan and South Korea, but the opposite is true for SAARC. In the case of SAARC-USA FTA both the parties gain. However, in the case of SAARC-EU FTA, only the EU gains significantly, while SAARC loses. It may be noted that the difference in welfare losses to the United States and the EU as a result of removing its subsidies is insignificant. The results show that SAARC countries will definitely reap benefit from the FTAs with 3+2 on fixed tariff combinations, but only on a case-by-case basis. Therefore, it is in the best interest of SAARC countries to enter into FTA with selective countries, or open up only those

sectors that provide positive benefits. The results also suggest the existence of comparative advantage of SAARC nations over some of its partners. A careful observation evinces that SAARC members face welfare losses for having FTAs with China and the EU particularly because the sectors they deal with are highly competitive, while the opposite is true with Japan, South Korea and the United States, which are much differentiated.

It is very fascinating to note in the last three experiments, wherein the tariff protections are levied at varying rates (30%-20%, 10%-5% and 5%-0%) in addition to removal of agricultural subsidies by the United States and the EU, the gains for SAARC countries increase remarkably. In the final experiment, where the tariff protections on SAARC by 3+2 are only 5% and 0%, the gains for SAARC accounts for nearly US$ 1.2 billion. At the same time China, South Korea, and the United States also gain significantly accounting for about US$7.6 billion, US$ 6.1 billion, and US$1.8 billion, respectively. However, the gains for the EU dwindle down to a large extent. ROW is a loser throughout. All things considered, SAARC as a single entity should have no compunction to opt for an FTA arrangement with 3+2. Experiments clearly indicate that SAARC and all the contracting members' welfare improve considerably. The highest gain comes for the SAARC bloc if the tariffs are completely removed. This is an interesting result because plurilateral FTA with complete liberalization is the most rewarding of all FTAs to the entire bloc, inclusive of both SAARC and 3+2 countries.

Figure 3. Welfare Gains and Losses
(Plurilateral: SAARC as Single Entity)

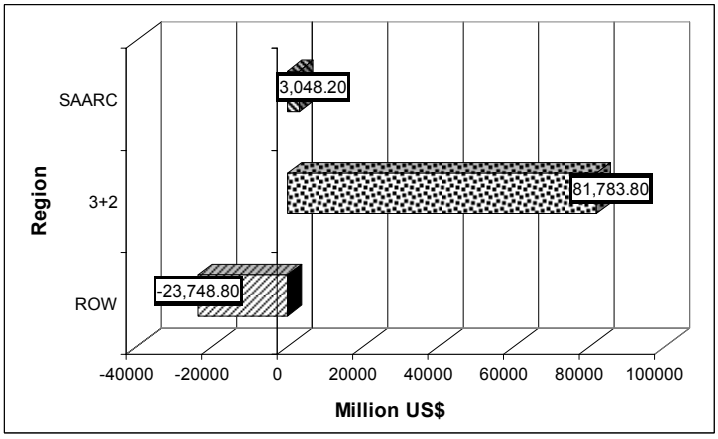


Figure 3 shows the results of the plurilateral SAFTA+3+2 effects. While SAARC gains US$3.04 billion, which is almost the double as compared with the bilateral SAFTA effects, but 3+2 receives the largest share of welfare gains under this scenario. This is not surprising for the fact that 3+2 is dominated by some of the world's largest and strongest economies. Further

breakdown (Table 6) shows that China, Japan, South Korea and the United States receives the largest gains out of this plurilateral FTA accounting for US$24.04 billion, US$8.12 billion US$22.87 billion and US$25.01 billion, respectively. As noted above, this FTA would certainly be the most rewarding of all FTAs to both SAARC and 3+2. However, ROW suffers a huge welfare loss. This can be attributed to diversion of trade flows from the major economies to the SAARC region.

Table 6. Welfare Gains and Losses

Region/Countries	Welfare (US$ ml)
SAARC	3,048.20
CHN	24,048.00
JPN	8,124.40
KOR	22,872.10
USA	25,016.20
EU	1,723.10
ROW	-23,748.80

The results suggest that those countries that lack comparative advantage in terms of resource endowments, technology and the like, will be worse off in a free trade. In order to enjoy the benefits of free trade by all countries in a plurilateral FTA situation, any country that loses will need to be compensated by winners. Therefore, the results once again render support to our hypothesis that compensating the losers by winners by way of tariff concessions results in welfare gains for all concerned.

Figure 4. Welfare Gains and Losses
(Bilateral: SAARC as Single Entity)

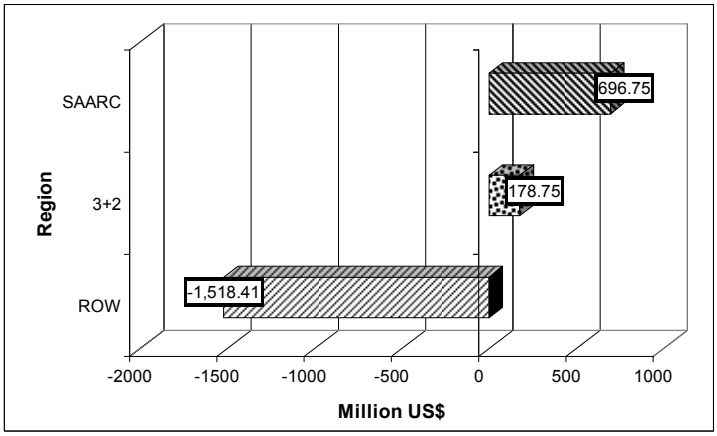
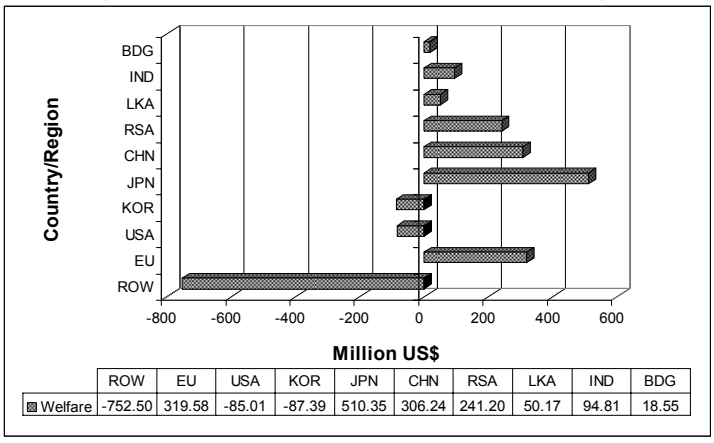


Figure 4 provides the results of the bilateral SAFTA+3+2 effects when SAARC behaves as a single entity. SAARC still gains to the tune of US$696.75 million; however, the gains are reduced to a large extent. The gains for 3+2 are not so significant because of the trade diversion by SAARC members from 3+2 to intra-regional bloc. ROW loses but not as badly as in the case of plurilateral SAFTA+3+2.

Figure 5 shows the results of the bilateral SAFTA+3+2 effects when SAARC countries have individual FTA with 3+2. In this case, the total gains for SAARC countries reduce to US$404.73 million, while the welfare of 3+2 improves considerably. This sends a clear signal for why 3+2

Figure 5. Welfare Gains and Losses
(Bilateral: SAARC as Individual Countries)



	ROW	EU	USA	KOR	JPN	CHN	RSA	LKA	IND	BDG
Welfare	-752.50	319.58	-85.01	-87.39	510.35	306.24	241.20	50.17	94.81	18.55

will benefit by trading with the South Asian countries. ROW is still a loser for the same reason as stated earlier.

Trade Creation and Trade Diversion Effects

If we take a case of China, it increases its import of crops by US$1.35 million from SAARC, US$2,011.45 million from Japan, US$4,458.15 from South Korea, US$5.35 million from the United States, and US$ 2,441.09 million from the EU under the plurilateral SAFTA+3+2 scenario. The sum of these increases is US$8,917.39 million. On the other hand, China decreases its import of crops from ROW by US$149.78 million. Thus, the trade creation is equivalent to US$ 8,767.61 million (US$8,917.39 – US$149.78).

Likewise, Japan increases its trade volume with SAARC by US$854.48 million, with China by US$3,057.56 million, and with South Korea accounting for US$1,141.52 million. At the same time, Japan increases its imports from the United States, the EU and ROW accounting for US$4,852.68 million, US$2,965.18 million and US$5,939.75 million, respectively. This indicates that there is a significant trade creation for Japan under the SAFTA+3+2 scenario. The most interesting example of trade creation is the case of the SAARC bloc per se. The total trade volume of the SAARC under this scenario goes up by US$23.41 million from South Korea, and US$6,384.41 million from the United States, while it decreases its trade from within SAARC itself by US$157.41 million, from China by US$220.64 million, from Japan by US$309.54 million, from the EU by US$242.44 million, and from ROW by US$872.41 million. The net trade creation is US$4,605.38 million (US$6,407.82 – US$1,802.44). Taking another example, the EU's trade volume increases by US$ 20,255.24 million, while it decreases by US$12,715.13 million. The net trade creation of the EU alone under the SAFTA+3+2 scenario is a chunk of

US$12,715.13 million. Therefore, the overall trade creation effect is much higher if we take all of the countries into account, evidently supporting our second hypothesis. Needless to say, the SAFTA+3+2 scenario has a much smaller trade diversion effect.

Changes in Industry Output, Private Household Demand, Aggregate Exports and Aggregate Imports

The SAFTA+3+2 scenario is anticipated to have major changes on industry's output, household demand, and exports and imports of all countries. The industry output of SAARC is quite the reverse of what we saw in the SAFTA scenario. There is evidently a swapping in the comparative advantage pattern based on trade complementarities and resource endowments: SAARC countries are forced to pull back to agriculture sector, while the manufacturing and service sectors are dominated by Japan and South Korea that have a greater advantage over these sectors. SAARC and China will specialize in similar industries mostly comprising the agro-based and manufacturing sectors, clearly signaling their midway development phases. The United States and the EU are still the major producers of agriculture products, attributable to its strong presence of agriculture subsidies. SAARC, China and South Korea become the major exporters of textile goods, while Japan and the EU specialize in machinery and manufactures, respectively.

In regards to the private household demand, there is a major increase in all the regions. SAARC's household demand for machinery goods increases sharply by US$1,147.79 million. Interestingly, Japan's agricultural imports expand by US$14,313 million. This shows that there is a major shuffling of demand for products amongst the regions. This may also mean that, as the regions specialize in specific products, the resource allocation efficiency improves for all countries, raising not only the demand but also the overall production of those specialized products. This trade pattern largely supports the Heckscher-Ohlin Theory[9] that the international trade is largely driven by differences in country's resources.

Aggregate exports for all countries increase significantly in agriculture and manufacturing sectors, except for the United States in the manufacturing sector. SAARC, China, South Korea

and the United States experience a drop in exports of services. Aggregate imports also increase in all the countries with the exception of Japan in the manufacturing and service sector. As expected, ROW's imports decrease in all major sectors.

Changes in Terms of Trade, GDP Indices, and Allocative Efficiency

Table 7 shows the changes in terms of trade, GDP indices, and allocative efficiency. The results show that SAFTA+3+2 have positive impacts on the terms of trade of all countries, except for Japan and ROW. There is a mixed effect on change in GDP price indices. However, the GDP quantity indices as well as the allocative efficiencies of SAARC, China, Japan, and South Korea increase significantly, while there is a decrease in the case of the United States, the EU and ROW.

Table 7. Changes in Terms of Trade, GDP Indices, and Allocative Efficiency

Countries	Δ in Terms of Trade (%)	Δ GDP Price Index (%)	Δ in GDP Quantity Index (US$ million)	Allocative Efficiency (Regional EV)
SAARC	0.15	-0.19	793.94	794.10
CHN	0.44	0.30	6,516.75	6,519.40
JPN	-0.48	-1.00	4,046.25	4,044.53
KOR	0.55	-1.61	5,516.31	5,497.42
USA	0.57	0.32	-621.00	-621.55
EU	0.02	-0.13	-85.50	-85.43
ROW	-0.30	-0.58	-239.00	-238.87

Note: The change in terms of trade (2nd column) and GDP price index (3rd column) are compared to the base scenario fixed at 1 vis-à-vis the value of the post simulation under the FTA scenario.

Table 8 depicts the changes in trade balance and allocative efficiency in the three major sectors of agriculture, manufacturing and services. The trade balance of SAARC is negative for the manufacturing sector and service sectors. However, there is a large fluctuation in the trade balances of two largest economies of the United States and Japan. They exhibit contrasting changes especially with regard to agriculture and manufacturing sectors. The allocative efficiencies of SAARC, China, Japan and South Korea turn positive, but in the case of the US and the EU, it turns negative especially in the agriculture and service sectors.

Table 8. Changes in Trade Balance and Allocative Efficiency Effect

Change in Trade Balance (US$ million)							
Sector	**SAARC**	**CHN**	**JPN**	**KOR**	**USA**	**EU**	**ROW**
Agriculture	63.50	-1475.74	-18802.07	-4803.47	35686.28	-731.94	-12568.75
Manufacturing	-1097.94	2279.62	17706.20	3557.11	-34852.72	1437.92	9414.65
Services	-83.63	-1001.16	1979.93	-970.82	-4526.61	838.06	7951.61
Allocative Efficiency Effect: Commodity Summary							
Sector	**SAARC**	**CHN**	**JPN**	**KOR**	**USA**	**EU**	**ROW**
Agriculture	79.17	1864.72	2903.42	4564.39	-672.93	-430.81	-304.98
Manufacturing	685.39	4584.64	1115.26	758.44	290.52	566.07	-255.57
Services	21.31	70.04	-48.37	129.30	-200.79	-164.57	83.25

In Table 9, we report the most viable FTAs that SAARC as a single entity could have with 3+2 on a plurilateral basis. SAFTA+3+2 FTA would be most viable within equal tariffs ranging from 0-5%, as well as varying tariff rates between 0% and 10%. However, this FTA is not feasible at fixed tariff rates.

Table 9. Viable FTAs under SAFTA+3+2 Scenario
(Plurilateral: SAARC as Single Entity)

S/N	Plurilateral		Tariffs % combination		
	Simulation No.	**Contracting Countries**	**Fixed**	**Equal**	**Varying**
1	S2b	SAARC and 3+2		5-5	
2	S2c	SAARC and 3+2		0-0	
3	S3b	SAARC and 3+2			10-5
4	S3c	SAARC and 3+2			5-0

Note: As in Table 6.

Table 10 shows the most feasible tariff structure for bilateral SAFTA+3+2 FTA. In regards to the SAARC-USA FTA, fixed tariff rate of 0-0% is the most feasible. SAARC-CHN FTA and SAARC-EU FTA would be feasible under the varying tariff combinations, but lowering anything below 30-20% and 10-5% in the case of both SAARC-CHN FTA and SAARC-EU FTA are not feasible.

Table 10. Viable FTAs under SAFTA+3+2 Scenario
(Bilateral: SAARC as Single Entity)

S/N	Bilateral FTA		Tariffs % combination		
	Simulation No.	**Contracting Countries**	**Fixed**	**Equal**	**Varying**
1	S4	SAARC-USA	0-0		
2	S11a	SAARC-CHN			30-20
3	S15b	SAARC-EU			10-5

Note: As in Table 6.

Table 11. Viable FTAs under SAFTA+3+2 Scenario
(Bilateral: SAARC as Individual Countries)

S/N	Bilateral FTA		Tariffs % combination		
	Simulation No.	Contracting Countries	Fixed	Equal	Varying
1	S1a	BDG-CHN	10-10		
2	S11b	LKA-CHN	5-5		
3	S11c	LKA-CHN	0-0		
4	S12b	LKA-JPN	0-0		
5	S13b	LKA-KOR	0-0		
6	S15a	LKA-EU	5-5 + RS		
7	S16b	RSA-CHN	5-5		
8	S16c	RSA-CHN	0-0		
9	S17a	RSA-JPN	10-10		
10	S17b	RSA-JPN	5-5		
11	S17c	RSA-JPN	0-0		
12	S30a	IND-EU		10-10 + RS	
13	S30b	IND-EU		5-5 + RS	
14	S30c	IND-EU		0-0 + RS	
15	S31a	LKA-CHN		10-10	
16	S31b	LKA-CHN		5-5	
17	S31c	LKA-CHN		0-0	
18	S32a	LKA-JPN		5-5	
19	S32b	LKA-JPN		0-0	
20	S33a	LKA-KOR		5-5	
21	S33b	LKA-KOR		0-0	
22	S37a	RSA-JPN		5-5	
23	S37b	RSA-JPN		0-0	
24	S41a	BDG-CHN			30-20
25	S42a	BDG-JPN			20-5
26	S43a	BDG-KOR			20-5
27	S46a	IND-CHN			20-10
28	S47a	IND-JPN			20-10
29	S50a	IND-EU			20-5 + RS
30	S50c	IND-EU			5-0 + RS
31	S51a	LKA-CHN			15-10
32	S51b	LKA-CHN			10-5
33	S51c	LKA-CHN			5-0
34	S53a	LKA-KOR			10-5
35	S53b	LKA-KOR			5-0
36	S57a	RSA-JPN			30-5
37	S57b	RSA-JPN			10-0

Note: As in Table 6. RS=Removal of subsidies.

With regard to the bilateral FTA for SAARC as individual countries (see Table 11), Bangladesh has a viable FTA only with China. Sri Lanka has the maximum flexibility to the extent of removing the tariffs completely. Sri Lanka's FTA is feasible with China, Japan, South Korea, and the EU at fixed, equal and varying tariffs from minimum of zero to maximum of 15%. This is no big surprise, as Sri Lanka's economy is the most liberalized of all amongst the SAARC members. RSA also has a good possibility of having viable FTAs, particularly with China and Japan at fixed, equal and varying tariff rates. As for India, it is quite evident that IND-EU FTA is

the most feasible of all. IND-CHN FTA and IND-JPN FTA are viable, but at a much higher and varying tariff rates. This implies that the IND-CHN FTA and IND-JPN FTA are feasible on the condition that China and Japan grants preferential tariff concessions to India.

6. CONCLUSION

This paper has evaluated the major effects and welfare implications of SAFTA as well as the SAFTA+3+2. Exhaustive experiments were performed using the equivalent variation component to gauge the welfare gains and losses of different countries/regions. Additional analyses were carried out to investigate the trade creation and trade diversion effects, changes in industry output, private household demand, aggregate exports and imports, changes in terms of trade, GDP indices, and allocative efficiencies. Finally, some viable FTAs were identified amongst SAARC and 3+2 countries. Findings revealed that the largest gain results from a plurilateral FTA with complete liberalization in all sectors. Thus, the plurilateral FTA is a *win-win* game for all members concerned. The maximum possible FTAs emerge from varying combinations of preferential tariff treatment from the non-LDCs/developed countries to the LDCs. Our first hypothesis was strongly buttressed by the evidence that selective combinations of tariff rates result in welfare gains of both the contracting parties generating maximum possible combinations for feasible FTAs amongst SAARC and 3+2 countries. There was also ample evidence pointing that the SAFTA and SAFTA+3+2 are welfare enhancing that results in more trade creation than trade diversion corroborating our second hypothesis. Although major fluctuations were observed in the industry output, the household demand, aggregate exports and imports, terms of trade, GDP, and allocative efficiencies for SAARC as well as 3+2 increase considerably particularly in the case of SAFTA+3+2 scenario.

The findings of this study point to some important implications. For instance, plurilateral FTA amongst SAARC countries is not a feasible proposition, while the same for 3+2 countries is the most rewarding. SAARC as a single entity will benefit by having FTAs with South Korea, the

United States and the EU. The study revealed several viable FTAs. Some of the most significant ones are: SAARC-3+2, SAARC-USA, SAARC-CHN, SAARC-EU, IND-RSA, IND-LKA, IND-EU, IND-JPN, LKA-CHN, LKA-JPN, LKA-KOR, LKA-EU, RSA-CHN, and RSA-JPN. Broadly speaking, preferential tariffs improve the chances of widening the possibilities for more FTAs. Moreover, reducing the import tariffs by a fixed proportion for all SAARC countries will not be in the best interest of all members, which is as expected. The best set of tariff combination is to compensate the losers by way of tariff concessions by winners. This means that there is a need for non-LDCs to provide the LDCs with the grace period for liberalizing its sectors. However, the long-run implication is to move towards "SAFTA+3+2 FTA" and ultimately liberalize all sectors.

Finally, while this research is by no means the end of algorithm on the subject, few limitations may be set forth as follows. First, the importance of other trade barriers, such as para-tariffs and non-tariff barriers though well recognized could not be considered, as these components do not lend themselves readily to quantification within the purview of the GTAP analysis. Second, the GTAP6 data pertains to 2001 benchmark, hence future work could use more recent data. Lastly, the use of dynamic analysis might be another alternative to deduce more conclusive findings.

ENDNOTES

[1] AGE models are a class of economic model that use actual economic data to estimate how an economy might react to changes in policy, technology, or other external factors. AGE models are also referred to as computable general equilibrium (CGE) models. They descend from the input-output models pioneered by Leontief (1986), but assign a more important role to prices.

[2] The antonym of multilateralism would be unilateralism, when one state acts on its own.

[3] Bilateral FTAs are often referred to as RTAs as they fall within the domain of regional blocs.

[4] Other trade barriers such as para-tariffs and non-tariff barriers (e.g., administrative delays, customs clearance, restrictions on health safety, environmental, and religious reasons) are not taken into account as they are not quantifiable within the purview of the GTAP analysis. The same is left out for future research.

[5] Note that we do not report all tables of results for the sake of brevity and space considerations. They are available upon request from the authors.

[6] In economics, equivalent variation (EV) means "how much money would have to be taken away from the consumer

before the price change to leave him as well off as he would be after the price change" (Varian, 2003, p. 255). The value of the equivalent variation is given in terms of the expenditure function:

$EV = e(p0,u1) - e(p0,u0) = e(p0,u1) - w = e(p0,u1) - e(p1,u1)$, where w is the wealth level, $p0$ and $p1$ are the old and new prices respectively, and $u0$ and $u1$ are the old and new utility levels, respectively.

[7] Table of results are not reported for brevity.

[8] There are many more combinations where one of the contracting parties gains while the other loses. They are not considered because our interest lies in finding the best possible tariff combinations that would most likely be acceptable or feasible to both/all contracting parties.

[9] The theory emphasizes the interplay between the proportions in which different factors of production are available in different countries and the proportions in which they are used in producing different goods [see Krugman and Obstfeld (2003, pp. 67-86) for further details].

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