

Regional Trade Cooperation and Food Prices: an Assessment for South Asian Free Trade Area (SAFTA)

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Abstract:

The objective of this paper is to assess the welfare and trade consequences of the SAFTA agreement and to evaluate if it can help reduce the impact of increased volatility of world agricultural prices in South Asia. Two counterfactual policy simulations in particular, classified into cooperative and global non-cooperative scenario are carried out. The former simulates the tariff reduction schedule based on the SAFTA agreement, while the latter analyzes the impact of global food export restrictions on South Asia. It uses a dynamic multi-country multi-sector Computable General Equilibrium model (MIRAGE), combined with detailed tariff line information from the 2004 MAcMap HS6 database. Our findings are that SAFTA leads to moderate gains among its members: in particular this trade agreement is trade diverting. Moreover it alone could not counter the effects of high global food prices, due to the region's small share in world trade

Keywords:

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1. Introduction

The countries of South Asia are now in the midst of an important path towards regionalism. After much anticipation, uncertainty and skepticism, the South Asian Free Trade Area (SAFTA) agreement finally came into force in January 2006, paving way for the most significant step towards intensified trade integration in the region thus far. SAFTA comes after two decades of gradual and arduous political negotiation since the formation of the South Asian Association of Regional Co-operation (SAARC) in 1985, and a decade of limited exchange of trade preferences under the South Asian Preferential Trade Area (SAPTA). The agreement—contracted by four least developing countries (LDC), namely Bangladesh, Bhutan, Maldives and Nepal, and three middle income countries India, Pakistan and Sri Lanka—imposes a detailed schedule to be completed by 2016 and provides for preferential treatment and longer tariff cutting schedule for LDC members¹.

Two decades have passed since the onset of regionalism in South Asia and evidence suggests that intra-regional trade improved only marginally (World Bank 2004). Whereas there is a broad consensus that sustained growth is the most important challenge facing South Asia today, disagreements on the role that regional trade integration play remains. Skeptics argue that taken in isolation, the economic case for SAFTA remains weak. Theoretical analyses by Panagariya (2003; 2007) indicate that SAFTA is welfare reducing due to trade diversion effects. Analyses of trade data by Pitigala (2005) find that South Asian countries are only classified as moderate “natural trading partners” because they tend to trade more intensively with countries outside the region and specialize in products that are predominantly labor intensive where they compete against each another². Baysan et al. (2006) offers three compelling reasons why SAFTA is economically unattractive: (a) the region is tiny in both per capita income and share in world trade; (b) prohibitive protection levels restrict intra-regional trade and would likely lead to trade diversion effects; and (c) the list of excluded sectors and strict rules of origins may greatly increase distortions related to political favors from domestic lobby groups.

¹ See the Agreement on South Asian Free Trade Area (SAFTA) for details.

² Moderate “natural trading partners” based on volume of trade, geographical proximity and trade complementarity.

Empirical simulation models have likewise been used to assess SAFTA's desirability. Using a gravity model, Rodriguez-Delgado (2007) finds minor trade flow impact, while Wilson and Otsuki (2008) discover significant expansion in intra-regional trade when improvements in trade facilitation are accounted for³. Similarly, studies using global computable general equilibrium (CGE) models report moderate to optimistic results. Using the GTAP (Global Trade Analysis Project) model and database, Pigato et al. (1997) find that welfare gains from preferential trade liberalization are bigger for all South Asian countries except India, which gains more from unilateral trade liberalization. In contrast, recent studies using updated versions of the GTAP database reveal that under SAFTA, large countries are likely to experience more welfare gains compared to smaller countries. Sri Lanka emerges as the biggest gainer while Bangladesh suffer welfare losses over-all due to trade diversion effects and relatively high protection levels (Bandara and Yu 2003; Raihan and Razzaque 2007; Chadha, Pratap and Tandon 2007; Kumar and Saini 2007).

However, these CGE studies are based on comparative static analysis coupled with instant full tariff elimination scenario without regard to SAFTA's tariff reduction schedule. Bouët *et al.* (2009) address these flaws by using a dynamic model (MIRAGE: Modeling International Relationships in General Equilibrium), combined with detailed tariff line information from the 2004 MAcMap HS6 database (Bouët *et al.* 2008) to analyze the impact of SAFTA on Sri Lanka. They not only incorporate capital accumulation and growth effects but also take into account the tiered and temporal tariff line reduction prescribed in the SAFTA agreement. Similar to recent studies, they find small real income gains for all South Asian countries except Bangladesh which suffers a marginal loss in real income. A liberalization scenario that includes sensitive products limit the gains from trade of Sri Lanka, Pakistan and India but is welfare enhancing for least developed countries in the region, except for Bangladesh.

Despite perceived moderate economic gains, Ahmed and Ghani (2008) argue that SAFTA could pave way for new opportunities—in the form of improved transport and trade facilitation, reduced cost of doing business and energy issues. Moreover, SAFTA and SAARC could be used to further improve political relations with the effect of reducing economic and social cost in the region. Indeed, during the 15th SAARC summit, government ministers

³ Although they caution that their estimated trade gains may overestimate actual gains.

identified vital avenues for further economic cooperation and possible ways to help alleviate the impact of high global food prices—by drawing up short- to medium-term SAARC agricultural strategy (SAARC 2008).

This cooperative response is particularly important as the recent 2007-08 global food price inflation brought renewed concerns regarding food security and welfare in the region. Although it is generally believed that the crisis was primarily spurred by complex global issues related to low inventories and growing demand for agricultural commodities, strong market for biofuels and low value of the US dollar (Abott et al. 2008), Chauffour (2008) argues that it was an indirect result of decades of trade-distorting policies that have encouraged inefficient agricultural production in rich countries together with high levels of protection in developing country agricultural markets. Anderson and Hayami (1986) attribute this to the natural tendency from taxing towards protecting and subsidizing the agricultural sector in the course of a country's development. This trend certainly applies to South Asia as well, where agricultural protection levels are among the highest in the world (Pitigala 2005).

Since trade is one way by which high food prices can be curbed, it is likely that SAFTA could help mitigate the impact of global food price inflation within the region. Whereas the existing literature has focused mostly on trade diversion issues and economic viability of SAFTA, no analytical work has been done so far to assess the food price mitigating potential of regional trade cooperation in South Asia. The objective of this paper is to assess the welfare and trade consequences of the SAFTA agreement and to evaluate if it can help reduce the impact of increased volatility of world agricultural prices. It fills the gap in the literature by extending the analysis of Bouët et al. (2009) in many respects. First, owing to food and agricultural focus, we improve their sketchy commodity aggregation by employing finer agricultural commodity details. Second, we take advantage of the recently released GTAP 7 database which uses 2004 as a benchmark year. Third, export restrictions, in the form of export taxes, are incorporated to analyze the likely food price implications of global export restrictions in South Asia.

Two counterfactual policy simulations classified into cooperative and global non-cooperative scenario are carried out. The former simulates the tariff reduction schedule based on the SAFTA agreement, while the latter analyzes the impact of global food export restrictions on South Asia.

Section 2 provides a brief background of of the SAFTA agreement while section 3 presents the model structure, the regional and commodity aggregation and the level of global protection. The simulation results are provided in section 4 and concluding remarks are provided in section 5.

2. Overview of the SAFTA agreement

The SAFTA agreement was signed during the 12th SAARC Summit in Islamabad on January 6, 2004. It came after two decades of painful political negotiation dating back to the formation of the SAARC in 1985, and a decade of limited exchange of trade preferences under the SAPTA. SAFTA took effect on 1st January 2006 and supersedes the previous SAPTA agreement. It imposes a tiered and temporal tariff reduction system among LDC and non-LDC members while at the same time provides special and differentiated treatment to LDC members. Moreover, LDC members are afforded technical assistance and mechanisms for compensation of revenue loss from tariff reduction.

The tariff reduction schedule is divided into two phases (Table 1). Between 2006 and 2008, non-LDC members India, Pakistan and Sri Lanka reduce their tariff to 20 percent while LDC members Bangladesh, Bhutan, Maldives and Nepal decrease their tariff to 30 percent between 2006 and 2008. If the tariff imposed by a non-LDC member in 2006 is lower than 20 percent, an annual reduction of 10 percent must be made in 2007 and 2008⁴. Similarly, LDC members pursue an annual reduction of 5 percent in 2007 and 2008, if actual tariff imposed on a particular commodity in 2006 is less than 30 percent.

In the second phase, non-LDC members reduce their tariff rates from 20 to 5 percent or less between 2008 and 2012, with the exception of Sri Lanka which is allowed an additional year. All non-LDC members are encouraged to adopt equal linear tariff reductions but not less than 15 percent reduction annually. LDC members are required to reduce their tariffs from 30 to 5 percent or less between 2008 and 2016, and are likewise encouraged to adopt linear (equal annual) reductions of not less than 10 percent annually.

⁴ This reduction is computed based on the Margin of Preference (MoP). The SAFTA agreement uses the term MoP which is analogous to Most Favored Nation (MFN) tariff.

Table 1. SAFTA Trade Liberalization Program: Number of Sensitive Products, Modalities of tariff reductions and compensations for LDCs

		Non-LDC importers			LDC importers			
		India	Pakistan	Sri Lanka	Bangladesh	Bhutan	Maldives	Nepal
Number of Sensitive Products								
Exporters	India	864			742			
	Pakistan	1190			1190			
	Sri Lanka	1065			1065			
	Bangladesh	1254			1249			
	Bhutan	157			157			
	Maldives	671			671			
	Nepal	1338			1302			
Tariff Reduction Schedule								
Non-LDC exporters	India	<u>Phase I (2006-2008)</u> Tariffs > 20% then reduce linearly to 20% by 2008 Tariffs < 20% reduce initial MoP tariff by 10% each year (2007 and 2008).			<u>Phase I (2006-2008)</u> Tariffs > 30% then reduce linearly to 20% by 2008 Tariffs < 30% reduce initial Margin of Preference tariff by 5% each year (2007 and 2008).			
	Pakistan				<u>Phase II (2008-2016)</u> Reduce tariff linearly to within 0-5%			
	Sri Lanka	<u>Phase II (2008-2012):</u> <ul style="list-style-type: none"> India and Pakistan (Reduce tariff linearly to within 0-5%) <u>Phase II (2008-2013):</u> <ul style="list-style-type: none"> Sri Lanka (Reduce tariff linearly to within 0-5%) 			<u>Compensations to LDCs:</u> <u>2007-2008:</u> Not more than 1% of custom duty collected <u>2009:</u> Not more than 5% of custom duty collected <u>2010:</u> Not more than 3% of custom duty collected			
LDC exporters	Bangladesh	<u>2006-2009:</u> Linear reduction to within 0-5%			<u>Phase I (2006-2008)</u> Tariffs > 30% then reduce linearly to 30% by 2008.			
	Bhutan				Tariffs <30% reduce initial Margin of Preference tariff by 5% each year (2007 and 2008).			
	Maldives				<u>Phase II (2008-2016)</u> Reduce tariff linearly to within 0-5%			
	Nepal							

Source: Agreement on South Asian Free Trade Area (SAFTA), S.A.A.R.C. (2008) and Bouët et al. (2009)

Notwithstanding the tariff reduction scenario, all non-LDC members are required to reduce their tariff to 0-5 percent for products coming from LDC members within three years of the agreement. Any SAFTA member can opt not to follow the phased tariff reductions based on

the agreement provided an immediate tariff reduction to within 0-5 percent is pursued, or an accelerated tariff reduction schedule is implemented.

Table 2. Top 10 Sensitive commodities for each South Asian country (at the HS2 level)

Bangladesh			Bhutan		
HS2 Description	Frequency	Tariff	HS2 Description	Frequency	Tariff
85 Electrical Machinery and Equipment and Parts There	116	16%	20 Preparations of Vegetables Fruit Nuts or othr Pa	48	30%
55 Man Made Staple Fibres	67	22%	7 Edible Vegetables and Certain Roots and Tubers	21	10%
39 Plastics and Articles Thereof	60	19%	25 Salt, Sulphur, Earths and Stone, Plastering Materi	21	19%
52 Cotton	59	17%	44 Wood and Articles of Wood, Wood Charcoal	16	15%
62 Articles of Apparel and Clothing Accessories Not	57	32%	15 Animal or Vegetable Fats and Oils and Their Cleava	14	30%
87 Vehicles othr Than Railway or Tramway Rolling Stoc	56	19%	94 Furniture, Bedding, Mattresses, Mattress Supports	9	29%
48 Paper and Paperboard, Articles of Paper Pulp of P	54	26%	10 Cereals	6	0%
73 Articles of Iron or Steel	48	25%	4 Dairy Produce, Birds Eggs, Natural Honey, Edible P	4	29%
61 Articles of Apparel and Clothing Accessories Knit	44	32%	8 Edible Fruit and Nuts, Peel of Citrus Fruit or Mel	4	20%
84 Nuclear Reactors, Boilers, Machinery and Mechanica	44	9%	62 Articles of Apparel and Clothing Accessories Not	3	30%
Total	605		Total	146	
Share in Sensitive List	48%		Share in Sensitive List	93%	
India			Maldives		
HS2 Description	Frequency	Tariff	HS2 Description	Frequency	Tariff
61 Articles of Apparel and Clothing Accessories Knit	103	15%	72 Iron and Steel	169	16%
62 Articles of Apparel and Clothing Accessories Not	82	15%	39 Plastics and Articles Thereof	126	26%
39 Plastics and Articles Thereof	68	15%	3 Fish and Crustaceans, Molluscs and othr Aquatic In	42	15%
72 Iron and Steel	49	20%	87 Vehicles othr Than Railway or Tramway Rolling Stoc	32	66%
7 Edible Vegetables and Certain Roots and Tubers	48	37%	7 Edible Vegetables and Certain Roots and Tubers	31	15%
8 Edible Fruit and Nuts, Peel of Citrus Fruit or Mel	34	38%	84 Nuclear Reactors, Boilers, Machinery and Mechanica	23	20%
15 Animal or Vegetable Fats and Oils and Their Cleava	32	80%	73 Articles of Iron or Steel	20	25%
12 Oil Seeds and Oleaginous Fruits, Miscellaneous Gra	32	29%	20 Preparations of Vegetables Fruit Nuts or othr Pa	16	17%
40 Rubber and Articles Thereof	28	17%	8 Edible Fruit and Nuts, Peel of Citrus Fruit or Mel	15	15%
11 Products of the Milling Industry, Malt, Starches.	28	34%	16 Preparations of Meat of Fish or of Crustaceans M	15	18%
Total	504		Total	489	
Share in Sensitive List	58%		Share in Sensitive List	73%	
Nepal			Pakistan		
HS2 Description	Frequency	Tariff	HS2 Description	Frequency	Tariff
62 Articles of Apparel and Clothing Accessories Not	117	22%	85 Electrical Machinery and Equipment and Parts There	112	17%
61 Articles of Apparel and Clothing Accessories Knit	114	24%	84 Nuclear Reactors, Boilers, Machinery and Mechanica	97	12%
55 Man Made Staple Fibres	68	11%	62 Articles of Apparel and Clothing Accessories Not	96	25%
39 Plastics and Articles Thereof	64	20%	39 Plastics and Articles Thereof	81	20%
85 Electrical Machinery and Equipment and Parts There	59	8%	87 Vehicles othr Than Railway or Tramway Rolling Stoc	73	58%
48 Paper and Paperboard, Articles of Paper Pulp of P	55	17%	73 Articles of Iron or Steel	67	23%
7 Edible Vegetables and Certain Roots and Tubers	50	8%	61 Articles of Apparel and Clothing Accessories Knit	64	25%
63 othr Made Up Textile Articles, Sets, Worn Clothing	48	10%	55 Man Made Staple Fibres	64	19%
20 Preparations of Vegetables Fruit Nuts or othr Pa	45	29%	48 Paper and Paperboard, Articles of Paper Pulp of P	46	20%
60 Knitted or Crocheted Fabrics	44	15%	40 Rubber and Articles Thereof	38	16%
Total	664		Total	738	
Share in Sensitive List	50%		Share in Sensitive List	62%	
Sri Lanka					
HS2 Description	Frequency	Tariff			
40 Rubber and Articles Thereof	70	13%			
7 Edible Vegetables and Certain Roots and Tubers	52	21%			
8 Edible Fruit and Nuts, Peel of Citrus Fruit or Mel	47	25%			
48 Paper and Paperboard, Articles of Paper Pulp of P	45	11%			
2 Meat and Edible Meat Offal	44	25%			
20 Preparations of Vegetables Fruit Nuts or othr Pa	42	25%			
15 Animal or Vegetable Fats and Oils and Their Cleava	37	22%			
84 Nuclear Reactors, Boilers, Machinery and Mechanica	36	4%			
73 Articles of Iron or Steel	34	12%			
85 Electrical Machinery and Equipment and Parts There	33	6%			
Total	440				
Share in Sensitive List	41%				

Notes: HS2 – Harmonized System Code at the 2 digit level; Frequency of Tariff lines is computed as the number of sensitive tariff lines at the HS6 level, then summed up at the HS2 level.

Source: Agreement on South Asian Free Trade Area (SAFTA)

The SAFTA agreement requires yearly notification of all non-tariff and para-tariff measures as well as the elimination of QRs. It likewise allows for a number of sensitive list items, which currently range between 13 and 25 percent of tariff lines of member states, but is subject to review every four years (Table 1).

Table 2 presents the average tariffs imposed, as well as the frequency of sensitive product tariff lines of the 10 most protected commodities for each SAFTA member at the HS2 level. It verifies that each country's sensitive list is concentrated within a few items, with the 10 most protected commodities at the HS2 level accounting for roughly 41 percent of total sensitive list in Sri Lanka to as high as 93 percent in Bhutan. These sensitive commodities are mostly confined to clothing and apparel, iron and steel, as well as plastics and machineries.

From the evolution of import volumes and tariffs imposed by each South Asian country with respect to their SAFTA trading partners⁵ we conclude three observations worth noting. First, imports mainly originate from non-LDC countries in South Asia except for India which imports relatively more from LDC countries Bangladesh, Bhutan, and Nepal. Second, tariffs imposed on sensitive products are higher than those levied on non-sensitive products with the slight exception of Bhutan. Third, LDCs impose higher tariffs on their LDC counterparts, as do non-LDC on their non-LDC trading partners. For example, tariffs imposed by Bangladesh on SAFTA LDCs are higher by at least 3 percentage points compared to those imposed on SAFTA non-LDCs (Sensitive: 24.3 vs 20.8 percent; and Non-sensitive: 17.4 vs. 14.4 percent). Likewise, India imposes higher tariffs on non-LDC counterparts relative to non-LDC partners (Sensitive: 21.6 vs 9.9 percent; and Non-sensitive: 14.1 vs. 6.4 percent).

3. Analytical Framework

Analyzing the impact of SAFTA on the economies of South Asia and the rest of the world requires a model capable of tracing the economy-wide feedback arising from global resource reallocation effects. Thus, we use the MIRAGE model (Decreux and Valin 2007)—a multi-country and multi-region recursive dynamic CGE model—to identify the main mechanisms at play and channels by which regional free trade can affect the South Asian economies. MIRAGE uses real world data from the GTAP 7 database (Narayanan and Walmsley 2008) and draws upon supplementary information on population, employment (urban and rural), and GDP projections from the World Bank and the Food and Agriculture Organization (FAO). What sets MIRAGE apart from other trade focused global CGE models is that it takes detailed tariff line information from the MAcMap-HS6 database (Bouët *et al.* 2008). MAcMap provides an equivalent measure of bilateral applied protection at the 6-digit Harmonized System (HS) for

⁵ These statistics can be requested to the authors.

5,111 products and 208 partners. This applied protection measure is aggregated across countries and products by using a weighting scheme based on a reference group of countries—to reduce the endogeneity bias in measuring protection—compared to the normal import volume weighting scheme (Bouët et al. 2008).

Table 3. Geographical Decomposition

#	Regions	Classification
1	Australia and New Zealand	North
2	Rest of the world	South
3	China and Hong Kong	South
4	Japan	North
5	Korea	North
6	Chinese Taipei	North
7	Other ASEAN Countries	South
8	Indonesia	South
9	Malaysia	South
10	Philippines	South
11	Singapore	South
12	Thailand	South
13	Viet nam	South
14	Bangladesh	South
15	India	South
16	Pakistan	South
17	Sri Lanka	South
18	Rest of South Asia	South
19	Canada	North
20	United States of America	North
21	Rest of North and Latin America	South
22	Brazil	South
23	EU27	North
24	Rest of OECD	North
25	Western Asia	South
26	Africa	South

Source: Authors' aggregation based on GTAP 7 nomenclature

Given that the study focuses on South Asia, substantial attention is paid in distinguishing each South Asian economy and the region's most important trading partners. The current geographical decomposition shown in Table 3 therefore identifies 26 regions, composed of 7

developed and 19 developing economies.⁶ Of these, four South Asian economies, namely Bangladesh, India, Pakistan, Sri Lanka and an aggregated Rest of South Asia (Bhutan, Maldives, Nepal, and Afghanistan) are treated as distinct regions. Table 3 also classifies the 26 regions into North (Developed) and South (Developing) zones respectively, to indicate their level of development based on traditional international economics terminology. This zonal classification is important in MIRAGE since goods produced in different zones are assessed different quality ranges. For instance, industrial products traded between two developed countries have a higher substitution possibility relative to those coming from another developing country.

The United States (US) and the European Union (EU) are treated separately since they are not only the largest market in the world but also grant the most extensive trade preferences, although processed sugar is still highly protected. The rest of OECD countries are grouped together to account for rich countries having substantial agricultural protection, while Australia and New Zealand represent powerful agricultural exporting countries with significantly lower protection. Asian tigers Japan, Korea, and Chinese Taipei are treated distinctly owing to their prohibitive agricultural protection, especially on rice. Brazil, most South East Asian countries, and an aggregated Rest of Western Asia are classified as separate regions to highlight their increasing importance to South Asian trade. Finally, the rest of North and Latin America is aggregated, as do Africa to represent net food importing regions.

Furthermore, an extensive sectoral decomposition of 32 commodities is employed, to identify key South Asian sectors and capture products with sizeable distortions (Table 4). Owing to focus on food price impact of regional free trade in South Asia, considerable effort is exerted to distinguish 17 agro-food sectors. As will be shown in the next section, this rich commodity aggregation detail is important in order to capture highly protected agricultural commodities such as paddy rice, wheat, cereals, oil seeds, as well as agro-industrial food items processed rice, sugar and food. Similarly, major manufacturing exports such as textiles, wearing apparel and leather are likewise given importance due to their vital role in the South Asian economy.

⁶ Correspondence between the decomposition adopted herein and the GTAP database can be requested to the authors.

Table 4. Sectoral Decomposition

#	Code	Sector
Agri-Food		
1	padd	Paddy rice
2	whea	Wheat
3	cere	Cereals
4	vege	vegetables and fruits
5	seed	Oil seeds
6	sugr	sugar case and beet
7	plbf	Plant-based fibers
8	otag	Other agriculture
9	meat	Bovine meat
10	anim	Animal products
11	rmilk	Raw Milk
12	wool	Wool, silk-worm, cocoons
13	veof	Vegetable oils and fats
14	milk	Milk and Dairy
15	rice	Processed rice
16	sugar	Sugar
17	food	Processed food
Primary and manufacturing		
18	fore	Forestry
19	fish	Fishery
20	mini	Mining
21	text	Textiles
22	weap	Wearing apparel
23	Leat	Leather
24	wopa	Wood and paper products
25	pcop	Petroleum and Coal Products
26	chem	Chemical products
27	meta	Mineral and metal products
28	moto	Motor vehicles and transport equipment
29	equi	Electronic equipment and machinery
30	otma	Other manufacture products
Services		
31	otse	Other services
32	trtr	Transport and trade

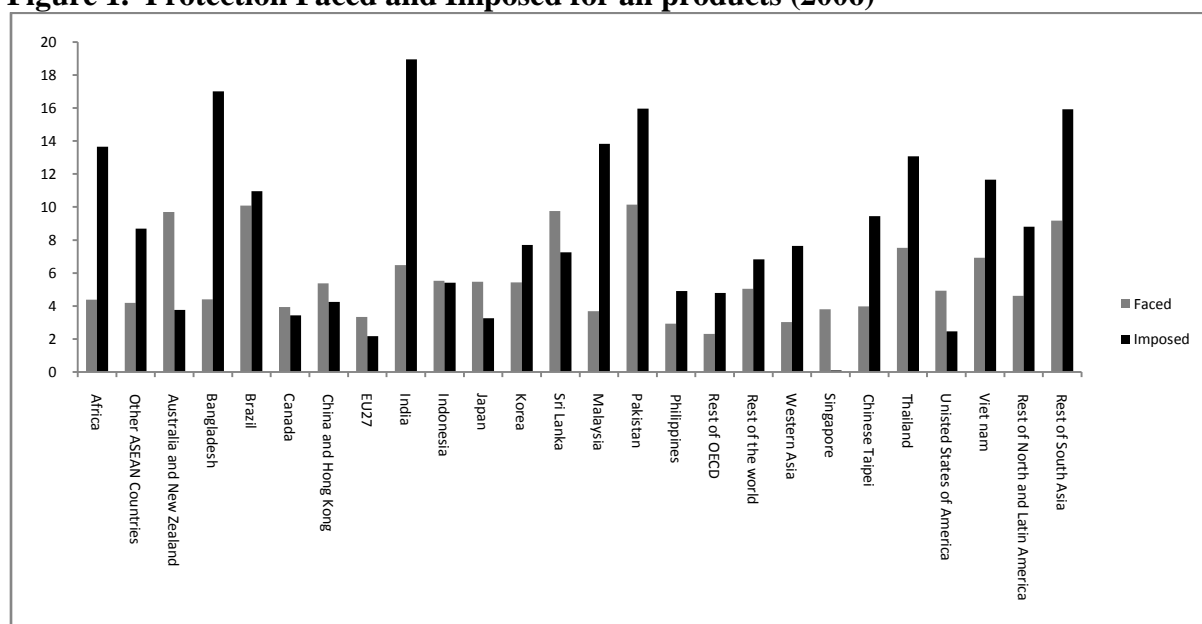
Source: Authors' aggregation based on GTAP 7 nomenclature

Figure 1 illustrates the structure of over-all protection at the start of SAFTA implementation in 2006.⁷⁷ It shows that developing countries generally impose much higher protection levels on imports than the tariff barriers their exports face. Notably, all South Asian countries, except Sri Lanka, apply some of the most restrictive protection in the world as average over-all applied tariffs are roughly twice as much as what their exports face. India is by far the

⁷⁷ Protection data come from the MAcMapHS6 database. See Bouet et al., 2008.

most protectionist country, followed by Bangladesh, Pakistan, and the Rest of South Asia. In contrast, tariff rates imposed by Canada, the EU and the US are much lower owing to trade preference extended to most developing countries. A comparison of worldwide protection by sector reveals that tariffs on agro-food sectors are roughly two times more than those imposed on non agro-food sectors.

Figure 1. Protection Faced and Imposed for all products (2006)



Source: Authors' calculation based on the MAcMap database

Let us now focus on intra-South Asian export and import shares. As discussed previously, intra-regional trade in South Asia is limited: intra-regional exports only account for less than 10 percent of total exports for each country in South Asia, with the exception of the Rest of South Asia with almost 24 percent.⁸ Similarly, intra-regional imports only account for as low as 2 percent share in India, 3 percent in Pakistan, roughly 15 percent in Bangladesh and Sri Lanka—again except for the Rest of South Asia where 32 percent of total imports are sourced from within the region.

In general, South Asian countries confront prohibitive tariff rates on paddy rice and processed rice from Japan, South Korea and Chinese Taipei which impose between 100 and 550 percent tariff rates. As a result, rice exports to these countries remain marginal, instead finding their way to the EU which accounts for at least one third to three fourths of total paddy rice

⁸ Data on regional trade may be requested to the authors.

exports and at most, two thirds of total processed rice exports of South Asia.

Owing to extensive trade preference received and high demand related to high income, a majority of the South Asia's exports are destined towards the EU and the US. Thus, these two trading partners account for at least 30 percent of India's total exports to as high as 81 percent in the case of Bangladesh.

Clearly, textiles and wearing apparels are the most important export earners in the region, accounting for about 17 percent in India to as high as 76 percent in Bangladesh. Note that roughly two thirds of these exports are sold to the EU and the US. Bangladesh and Pakistan and to some extent Sri Lanka are the least export diversified country in South Asia. In contrast, India is by far the most export diversified country with mining, textiles, apparel, chemical products, mineral and metals, other manufacture products and other services accounting for at least 5 percent share in total exports.

4. Simulation Results

The MIRAGE model relies on the GTAP7 and MAcMap database, which are both based on year 2004 data. Initially, a pre-experiment is conducted in MAcMap in order to account for worldwide tariff changes since 2004, arising from various regional trade agreements and the enlargement of the European Union. Based on this information and exogenous population and economic projections from the FAO and the World Bank, the dynamic MIRAGE model is solved to generate a baseline path from 2004 to 2020, with which simulation results are then compared.

4.1 Policy Scenario

We carry out policy experiments classified into cooperative and non-cooperative scenarios.

1. SAFTA: Scenario that simulates the SAFTA agreement. Tariff rates of non-sensitive products are reduced based on the tariff reduction schedule of the SAFTA agreement. All tariff rates imposed on sensitive products are maintained.
2. SAFTA-PLUS: A modified SAFTA agreement in which tariff reductions apply to all products (both sensitive and non-sensitive),
3. SAFTA-SUB: SAFTA coupled with the elimination of subsidies on export (only for exports within South Asia), factor and production for each South Asian economy. All

subsidies are reduced linearly between 2008 and 2015, and are completely eliminated by 2016.

4. SAFTA-BANS: SAFTA agreement together with a 100 percent export tax imposed by major exporters of Paddy rice, Wheat, Cereals, and Processed rice in 2007 and 2008⁹.
5. BANS: 100 percent export tax imposed by major exporters of Paddy rice, Wheat, Cereals, and Processed rice in 2007 and 2008. No SAFTA agreement is simulated.

4.2 Macroeconomic Impact

The SAFTA agreement results in marginal real income gains for all countries in South Asia, except for a 0.03 percent real income loss in Bangladesh. Sri Lanka is the foremost gainer with 0.29 percent followed by Pakistan, the Rest of South Asia, and India with 0.13, 0.06 and 0.04 percent gain in real income respectively (Table 5). The real income loss of Bangladesh stems from terms of trade deterioration of 0.09 percent, which outweighs the 0.06 percent allocation efficiency gains from trade liberalization. Essentially, the larger terms of trade loss is related to trade diversion effects and the initially high protection levels of Bangladesh prior to the start of the SAFTA agreement. Nevertheless, Bangladesh still gains an improvement in GDP and exports volume. Sri Lanka profits the most from SAFTA implementation as a result of both allocation and terms of trade improvements—owing to initially low protection levels. Both India and Pakistan likewise experience real income gains, although lower than Sri Lanka because of the initially high tariff rates for India, the moderately high tariffs of Pakistan, and the relatively smaller intra-South Asia trade shares—relative to total trade—of both countries compared to Sri Lanka.

SAFTA also brings about general improvements in factor prices, except for the price decline in return to natural resources in Bangladesh and Pakistan, and return to Land in Sri Lanka. Wages of unskilled agriculture increase relative to unskilled wages in non-agriculture in Bangladesh and Pakistan. On the other hand, it is skilled wages and unskilled wages in non-agriculture that increase more relative to unskilled agriculture wages in Sri Lanka, the Rest of

⁹ A major exporter is defined as accounting for at least 5 percent share in total world exports of that commodity.

South Asia and to some extent India—suggesting that, industry and services profit more relative to agriculture, thereby effectively pulling resources towards them (Table 5). Employment in agro-food sector falls for India, Sri Lanka and Rest of South Asia, while employment in non-agriculture remains unchanged in India, falls marginally in Bangladesh and Pakistan and increases slightly in Sri Lanka and Rest of South Asia.

Let us now compare the real income effects of SAFTA and SAFTA-PLUS scenarios (Table 5). Two observations are worth pointing out. First, Sri Lanka remains as the biggest gainer from SAFTA-PLUS, benefiting five times more than under SAFTA. Second, Pakistan's real income gain under SAFTA-PLUS matches Sri Lanka's gain under SAFTA. Third, the terms of trade of both Bangladesh and the Rest of South Asia worsen at least twice more under SAFTA-PLUS (Table 5), as they additionally give up high protection on their key domestic industries.

Factor prices increase slightly more under SAFTA-PLUS due to greater expansion in trade. Nevertheless, return to land, natural resources and unskilled wages in agriculture falls in India and return to natural resource decreases in Pakistan. Unskilled non-agricultural wages grow more relative to unskilled agricultural wages (except for Pakistan and Sri Lanka), while agricultural employment falls marginally in Bangladesh, India and Rest of South Asia.

Table 1. Macroeconomic effects by 2020 (Deviation from baseline)

	SAFTA					SAFTA-PLUS					SAFTA-SUB				
	Bangladesh	India	Pakistan	Sri Lanka	Rest of South Asia	Bangladesh	India	Pakistan	Sri Lanka	Rest of South Asia	Bangladesh	India	Pakistan	Sri Lanka	Rest of South Asia
Real Income	-0.03	0.04	0.13	0.29	0.06	-0.56	0.06	0.30	1.66	-0.18	0.43	0.07	0.15	0.30	0.15
Terms of Trade Gains	-0.09	0.01	0.06	0.21	-0.35	-0.47	0.02	0.19	1.09	-0.68	-0.23	0.02	0.08	0.17	-0.53
Allocation Efficiency Gains	0.06	0.01	0.05	0.07	0.24	0.02	0.04	0.11	0.46	0.31	0.44	0.08	0.06	0.10	0.41
All Other Gains	0.00	0.01	0.01	0.01	0.17	-0.12	0.00	0.00	0.11	0.19	0.23	-0.03	0.01	0.02	0.27
Exports	4.70	0.96	2.15	4.02	12.13	19.23	2.60	5.26	12.68	24.15	0.27	1.43	2.37	4.03	12.98
Initial (vol)	22.01	285.35	40.63	15.76	9.68	22.01	285.35	40.63	15.76	9.68	22.01	285.35	40.63	15.76	9.68
Imports	3.48	0.88	1.62	3.51	6.97	13.76	2.33	4.06	12.19	13.88	-0.27	1.24	1.82	3.48	7.21
Initial (vol)	13.19	127.26	27.23	9.89	5.56	13.19	127.26	27.23	9.89	5.56	13.19	127.26	27.23	9.89	5.56
GDP (vol)	0.07	0.03	0.11	0.19	0.44	-0.18	0.03	0.26	0.87	0.68	0.61	0.28	0.12	0.23	0.53
Initial (vol)	55.97	642.00	94.81	20.11	13.97	55.97	642.00	94.81	20.11	13.97	55.97	642.00	94.81	20.11	13.97
Factor Prices (Real terms)															
Return to capital	0.17	0.03	0.13	0.75	1.55	1.02	0.18	0.08	2.84	2.08	-3.06	-1.53	0.14	-0.07	-0.08
Return to land	0.40	0.02	0.28	-0.21	0.97	0.29	-0.18	1.32	2.68	2.20	2.04	-3.90	0.33	-0.55	0.61
Return to Natural Resources	-0.22	0.03	-0.66	0.11	0.60	-0.24	-0.11	-1.96	1.20	1.51	-0.63	0.05	-0.83	0.22	0.93
Skilled Wages	0.18	0.05	0.18	0.54	1.74	0.30	0.18	0.32	2.08	3.01	-2.66	0.03	0.18	0.47	-0.63
Unskilled Wages	0.21	0.04	0.23	0.58	1.54	0.59	0.14	0.64	2.64	2.84	-3.33	-1.44	0.26	0.32	-0.80
Unskilled Wages in Agriculture	0.36	0.03	0.28	0.06	1.23	0.41	-0.08	1.17	2.94	2.56	0.31	-3.34	0.33	-0.27	0.15
Unskilled Wages in Non-Agriculture	0.18	0.05	0.22	0.75	1.62	0.62	0.21	0.44	2.55	2.91	-4.01	-0.81	0.24	0.52	-1.06
Employment															
Agriculture and Food Sectors	0.08	-0.01	0.02	-0.26	-0.16	-0.09	-0.11	0.27	0.14	-0.14	1.89	-0.98	0.03	-0.30	0.49
Initial (Vol)	3.25	59.61	8.55	1.54	1.06	3.25	59.61	8.55	1.54	1.06	3.25	59.61	8.55	1.54	1.06
Non-Agriculture	-0.01	0.00	-0.01	0.08	0.04	0.02	0.04	-0.10	-0.05	0.03	-0.33	0.31	-0.01	0.09	-0.12
Initial (Vol)	21.37	205.36	27.12	5.09	5.00	21.37	205.36	27.12	5.09	5.00	21.37	205.36	27.12	5.09	5.00

Source: Simulation results based on the MIRAGE model.

The results under SAFTA-SUB and SAFTA are similar although the order of magnitude is greater for the former. All countries achieve real income gains under SAFTA-SUB, especially Bangladesh, which registers the highest real income gain of 0.43 percent—even surpassing those of Sri Lanka. The higher growth in real income and GDP volume confirm that, leveling the playing field, through the removal of trade distorting subsidies on exports (for exports within South Asia), factor input and production is favorable to all countries in South Asia, especially non-LDC members Bangladesh and the Rest of South Asia. Both allocation efficiency and other gains increase significantly for all countries under SAFTA-SUB, except for a marginal decline in other gains for India (Table 5). More importantly, Bangladesh’s terms of trade losses is offset by allocation efficiency gains which improve almost 7 times compared to SAFTA scenario.

The real income gains for all countries are amplified whenever the SAFTA agreement is combined with the elimination of all trade distorting subsidies (SAFTA-SUB). Although the evolution of the gains is different for each country, it is clearly noticeable that the real income gains for Bangladesh, Pakistan and Sri Lanka are amplified beginning 2008 and especially after 2016 when all subsidies are eliminated. Whereas the real income gains for the rest of South Asia fall slightly after reaching its peak in 2012, its over-all gain under SAFTA-SUB is still higher relative to the SAFTA scenario alone by 2020. India’s real income gains fall from 2004 to 2016 as it eliminates its own subsidies, but its real income improves markedly thereafter, confirming that India recovers its competitiveness by the time all other South Asian countries eliminate their subsidies as well.

4.3 Trade Impact

We now compare the trade and production impact of SAFTA, SAFTA-PLUS, SAFTA-SUB scenarios. All scenarios except, SAFTA-SUB are trade diverting in both exports and imports (Tables 6 and Table 7). All SAFTA countries except Bangladesh reduce their reliance on the rest of the world. This is especially true for the rest of South Asia where exports to the world fall, but intra-South Asian exports increase significantly. The pattern of changes in export by destination is similar although differing in magnitude for all countries except Bangladesh, which also increases its exports to the rest of the world. Under SAFTA, the growth in intra-regional exports is substantial ranging between 8 and 86 percent. However, it should be noted that the base/reference export values are quite small. The increase in intra-regional exports is expected

since tariff barriers for SAFTA members have been dismantled, making it more attractive to export within the region. The changes in exports under SAFTA-PLUS increase twice as much when compared to the SAFTA scenario since sensitive products are included, while the results under SAFTA-SUB lie between the two former scenarios.

Table 2. Changes in exports value by destination (Deviations from baseline, in percent)

	SAFTA					SAFTA-PLUS					SAFTA-SUB				
	Bangladesh	India	Pakistan	Sri Lanka	Rest of South Asia	Bangladesh	India	Pakistan	Sri Lanka	Rest of South Asia	Bangladesh	India	Pakistan	Sri Lanka	Rest of South Asia
Australia and New Zealand	2.4	-0.3	-1.2	-1.8	-7.8	10.3	-0.7	-3.4	-8.6	5.2	7.2	0.5	-1.2	-2.8	4.3
Rest of the world	2.0	-0.3	-1.2	-1.7	-21.8	9.7	-0.7	-3.5	-15.0	7.0	-2.0	0.2	-1.2	-2.1	8.9
China and Hong Kong	1.6	-0.5	-1.2	-2.1	-17.2	8.1	-1.0	-3.6	-9.7	5.7	11.1	0.3	-1.3	-1.2	7.2
Japan	2.7	-0.3	-1.1	-1.6	-7.5	11.8	-0.8	-3.0	-8.6	4.8	-8.0	0.3	-1.2	-1.6	5.5
Korea	2.2	-0.3	-1.1	-2.0	-6.6	10.8	-0.7	-3.2	-8.0	5.2	15.7	0.2	-1.3	-1.7	4.1
Chinese Taipei	1.9	-0.3	-1.1	-1.9	-6.4	8.8	-0.7	-3.2	-10.0	5.9	15.9	0.1	-1.2	-2.8	6.0
Other ASEAN Countries	2.7	-0.3	-1.3	-2.6	-5.0	10.0	-0.8	-3.9	-10.9	7.8	18.0	0.2	-1.2	-7.4	7.4
Indonesia	2.2	-0.3	-1.1	-1.9	-15.7	9.0	-0.6	-3.6	-8.8	3.8	7.5	-1.2	-1.1	-1.1	4.4
Malaysia	2.0	-0.3	-1.1	-1.8	-20.6	8.8	-0.7	-3.4	-9.8	4.4	-4.8	-0.4	-1.1	-2.3	4.9
Philippines	2.4	-0.3	-1.2	-0.9	-12.5	9.1	-0.5	-3.5	-7.2	7.5	15.0	-0.9	-1.3	-1.2	8.2
Singapore	3.0	-0.3	-1.1	-1.4	-22.6	13.5	-0.8	-3.2	-7.7	7.8	-15.1	0.5	-1.1	-1.7	6.5
Thailand	1.8	-0.3	-1.0	-0.9	-15.6	8.2	-0.8	-3.0	-8.0	6.0	2.1	0.5	-1.1	0.0	3.8
Viet nam	2.1	-0.3	-1.2	-4.1	-14.2	9.5	-0.6	-3.7	-14.0	6.9	15.2	-0.5	-1.4	-4.4	-1.6
Bangladesh		31.4	78.4	86.0	72.2		112.9	268.0	190.2	123.0		25.6	85.1	72.1	52.8
India	86.5		57.9	53.9	27.2	191.1		193.2	234.7	61.2	98.6		59.7	54.5	24.1
Pakistan	22.8	54.7		41.3	61.2	111.3	113.4		96.4	93.7	39.3	54.3		33.6	70.3
Sri Lanka	25.0	16.3	8.2		31.5	81.6	48.0	45.9		63.0	21.3	15.7	10.3		17.7
Rest of South Asia	41.8	37.9	43.4	39.0	350.8	142.1	76.1	66.3	55.9	369.3	4.7	38.9	43.8	48.9	359.3
Canada	3.3	-0.3	-1.3	-2.3	-7.1	16.3	-0.9	-3.9	-9.9	7.6	-5.5	0.2	-0.9	-2.9	4.9
United States of America	2.0	-0.3	-1.1	-2.3	-7.0	9.7	-0.8	-3.3	-10.1	6.3	4.8	0.5	-1.2	-3.8	2.2
Rest of North and Latin America	2.5	-0.3	-1.2	-2.1	-14.0	11.9	-0.7	-3.5	-13.4	6.2	4.5	0.5	-1.3	-3.4	4.2
Brazil	2.1	-0.2	-1.1	-2.6	-6.7	8.9	-0.6	-2.8	-10.2	13.7	18.5	0.3	-1.3	-3.2	18.9
EU27	2.8	-0.3	-1.3	-2.3	-6.9	14.0	-0.8	-3.8	-10.2	7.0	-5.8	0.4	-1.0	-1.9	5.4
Rest of OECD	2.7	-0.3	-1.2	-1.5	-5.9	13.4	-0.8	-3.4	-8.2	8.4	-5.1	0.4	-0.9	-0.4	8.3
Western Asia	1.5	-0.3	-1.1	-1.6	-17.6	7.1	-0.7	-3.2	-11.5	5.1	6.3	-0.1	-0.3	-1.5	3.4
Africa	1.9	-0.3	-1.0	-2.0	-7.2	8.4	-0.7	-2.9	-10.1	10.2	-0.5	-0.3	-0.8	-4.3	8.7

Source: Simulation Results

The changes in imports by origin exhibit the same pattern as those of exports. SAFTA scenarios are trade diverting for the rest of the world. Intra-regional imports increase significantly especially for the rest of South Asia. Similar to changes in intra-regional exports, the magnitude of variation is amplified under SAFTA-PLUS with results for SAFTA-SUB ranging in between the SAFTA-PLUS and the SAFTA scenario.

Table 3. Changes in imports value by origin (Deviations from baseline, in percent)

	SAFTA					SAFTA-PLUS					SAFTA-SUB				
	Bangladesh	India	Pakistan	Sri Lanka	Rest of South Asia	Bangladesh	India	Pakistan	Sri Lanka	Rest of South Asia	Bangladesh	India	Pakistan	Sri Lanka	Rest of South Asia
Australia and New Zealand	-1.9	0.3	0.5	1.7	-7.8	-12.2	0.4	3.1	6.0	0.1	-8.3	0.7	0.6	2.8	-10.5
Rest of the world	-2.1	-0.2	-0.6	0.6	-21.8	-7.6	-0.2	-1.1	2.7	-30.9	-26.7	-0.1	-0.4	0.6	-22.4
China and Hong Kong	-7.4	-0.3	-0.2	-1.0	-17.2	-23.2	-0.2	-0.6	-1.2	-25.1	-6.1	0.0	0.0	-0.5	-15.3
Japan	-2.6	0.2	0.4	-0.6	-7.5	-10.1	0.5	0.9	-2.0	-15.2	-2.7	0.4	0.5	-0.7	-7.8
Korea	-2.9	0.2	0.2	-0.1	-6.6	-9.5	0.5	0.4	-1.4	-13.2	-6.5	0.4	0.4	0.8	-4.1
Chinese Taipei	-2.5	0.2	0.2	-0.4	-6.4	-9.0	0.5	0.6	-2.5	-10.1	-3.5	0.5	0.4	0.7	-7.7
Other ASEAN Countries	-2.4	0.2	-0.1	-1.8	-5.0	-9.4	0.1	-3.5	-2.4	-11.3	-14.4	1.1	-0.5	-2.2	-8.5
Indonesia	-6.6	0.1	-0.5	-1.9	-15.7	-18.8	-3.3	0.0	-1.9	-22.6	-10.6	1.6	-0.4	-1.4	-16.7
Malaysia	-3.7	0.1	-0.5	-1.8	-20.6	-11.8	-1.5	0.0	0.8	-27.1	-4.3	0.8	-0.2	-1.7	-21.1
Philippines	-7.2	-0.2	0.2	-0.6	-12.5	-20.2	-0.2	0.4	0.9	-24.6	-12.3	-0.1	0.4	-0.1	-13.0
Singapore	-7.8	-0.1	-0.5	-1.9	-22.6	-19.8	0.0	-1.4	-0.8	-30.4	-3.9	-0.2	-0.3	-1.7	-22.0
Thailand	-6.1	-0.3	-0.7	-0.7	-15.6	-19.5	-0.7	-1.8	-2.4	-26.7	-11.1	0.2	-0.5	0.0	-13.4
Viet nam	-7.9	0.1	0.0	0.1	-14.2	-24.3	-7.8	1.7	5.6	-21.6	-7.3	3.2	0.0	0.3	-14.0
Bangladesh		86.5	22.8	25.0	41.8		191.1	111.3	81.6	142.1		101.4	41.8	21.1	4.8
India	31.4		54.7	16.3	37.9	112.9		113.4	48.0	76.1	23.9		54.5	15.5	38.8
Pakistan	78.4	57.9		8.2	43.4	268.0	193.2		45.9	66.3	85.4	60.4		10.4	42.1
Sri Lanka	86.0	53.9	41.3		39.0	190.2	234.7	96.4		55.9	71.9	55.1	34.4		48.5
Rest of South Asia	72.2	27.2	61.2	31.5	350.8	123.0	61.2	93.7	63.0	369.3	52.2	24.7	69.7	18.7	349.4
Canada	-2.1	0.2	0.5	0.8	-7.1	-12.6	0.1	1.8	16.3	-14.6	-6.1	1.0	0.7	3.9	-8.9
United States of America	-1.6	0.2	0.4	0.9	-7.0	-7.0	0.4	1.5	2.6	-10.5	-10.2	0.6	0.6	0.8	-7.8
Rest of North and Latin America	-2.6	0.3	0.4	0.6	-14.0	-9.7	-1.3	1.7	1.3	-19.1	-5.0	1.2	0.6	4.0	-14.8
Brazil	-1.6	-0.7	0.2	0.2	-6.7	-7.4	-4.2	2.2	-7.7	-10.6	-9.7	0.8	0.3	0.3	-10.3
EU27	-2.6	0.3	0.5	0.8	-6.9	-8.7	0.5	1.4	3.1	-14.6	-6.0	0.6	0.7	0.6	-7.6
Rest of OECD	-2.9	0.2	0.3	1.5	-5.9	-9.1	0.4	0.9	4.8	-9.6	-4.9	0.4	0.5	1.3	-7.2
Western Asia	-7.3	0.4	-1.1	-0.2	-17.6	-13.9	0.5	-1.3	2.3	-32.9	-0.4	0.6	-1.1	-0.7	-16.4
Africa	-1.4	0.2	-0.2	0.8	-7.2	-6.3	0.1	1.1	3.9	-17.3	-24.8	0.8	-0.1	0.4	-7.6

Source: Simulation Results

4.4 Impact on Production

In general, SAFTA has small impact on country production levels (Table 8). In all countries, production of major sectors expands except agro-food and Services in Sri Lanka and services in the rest of South Asia. In Bangladesh, the agro-food expansion is anchored on Wool and silk worm commodity and plant based fibers. The production growth in wearing apparel, textile leather also pushes Bangladesh's industrial production up. In Pakistan, it is mainly the expansion in sugar cane and processed sugar that allow agro-food sector growth, while it is textiles and motor vehicles and equipment that propel Pakistan's industrial output.

Table 4. Changes in production by sector (Deviations from baseline, 2020)

	SAFTA				
	Bangladesh	India	Pakistan	Sri Lanka	Rest of South Asia
Agro-food	0.1	0.0	0.2	-0.4	0.4
Industry	0.2	0.1	0.2	2.5	1.2
Services	0.0	0.0	0.0	-0.4	-0.1
	SAFTA-PLUS				
Agro-food	-0.9	-0.1	1.0	4.6	2.6
Industry	1.8	0.3	0.0	0.1	1.4
Services	-0.4	0.0	0.1	-1.0	0.0
	SAFTA-SUB				
Agro-food	1.8	-1.1	0.2	0.0	1.0
Industry	-6.5	1.0	0.3	1.1	-4.1
Services	1.3	0.6	0.0	0.0	0.3

Source: Simulation Results

In Sri Lanka, industrial sector expansion is due to mineral and metal products, wood and paper, and textiles. For the Rest of South Asia, the expansion in textiles and wearing apparel elicits the growth in industrial output. These growth patterns are further amplified in all countries except in India and Bangladesh, when liberalization on all products is accounted for. The impact of SAFTA-PLUS on production is slightly different. Agro-food production falls in Bangladesh and India, as both countries free up heavy agro-food protection (Table 8). To the extent that all protection on sensitive product is dismantled, previously protected agro-food sector finds it difficult to compete with cheaper imports. Dairy production falls substantially in Bangladesh, while processed sugar's contraction forces India's agro-food production to fall. Finally, the production impact under SAFTA-SUB is slightly different with Bangladesh and Rest of South Asia experiencing a hefty decline in industrial output (6.5 and 4.1 percent respectively), while India registering a percent reduction in agricultural output. In general, this reduction in output is due to the heavy concentration of manufacturing subsidies, particularly cotton and textiles in Bangladesh and agricultural subsidies in India.

4.5 Impact on Commodity Prices

Table 9 presents the temporal changes in world prices under SAFTA-BANS and BANS scenario respectively. It shows that the imposition of 100 percent export taxes on paddy rice, processed rice, wheat and cereals by major exporters of these commodities in 2007 and 2008 do not bring about the same magnitude of increase in world prices faced by South Asia—as these prices only increase between 24 and 68 percent. Moreover, a comparison of price variations

under SAFTA-BANS and BANS scenario confirms that the SAFTA agreement alone could not counter the effects of high global food prices, due to the region’s small share in world trade.

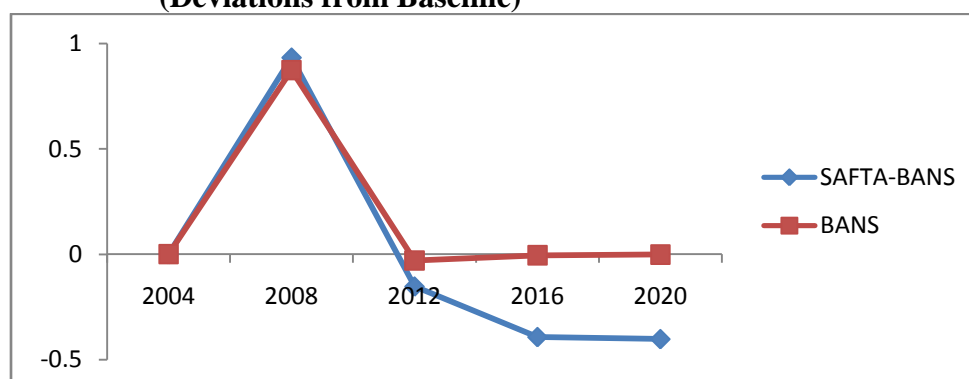
Table 5. Variation in World Prices (Deviations from baseline)

	SAFTA-BANS					BANS			
	2008	2012	2016	2020		2008	2012	2016	2020
Paddy	28.9	-0.1	0.0	0.0	padd	28.9	-0.1	0.0	0.0
Wheat	23.7	-0.2	0.0	0.0	whea	23.7	-0.2	0.0	0.0
Cereals	67.6	0.1	0.0	0.0	cere	67.6	0.1	0.0	0.0
Processed Rice	46.0	-0.3	0.0	0.0	rice	45.9	-0.3	0.0	0.0

Source: Simulation Results

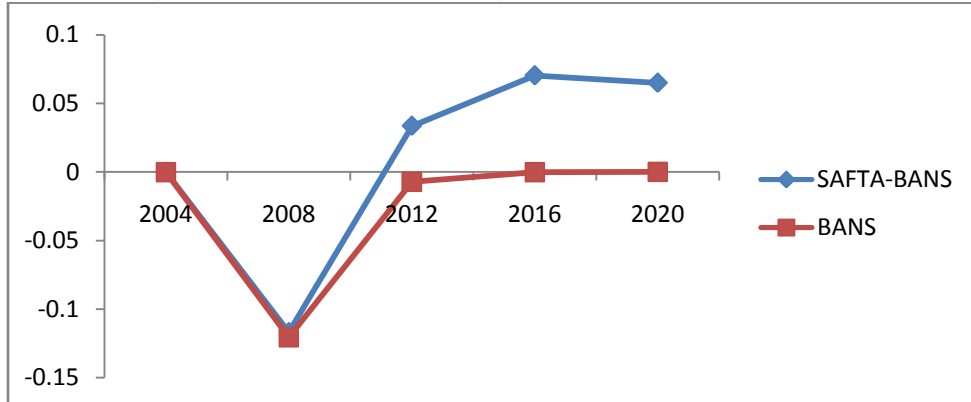
Figures 2 to 5 illustrate the evolution of consumer price index (CPI) for each South Asian economy, under the SAFTA-BANS and BANS scenario. The changes in CPI vary across South Asia with LDC members Bangladesh and Rest of South Asia experiencing marginally lower CPI under SAFTA-BANS relative to BANS scenario, whereas the CPI of non-LDC members India, Pakistan and Sri Lanka is lower under the BANS scenario by 2020. Nonetheless, two points are worth noting. First, the changes in CPI arising from SAFTA are small confirming that SAFTA could only marginally alter domestic food prices in the region. Second, the impact of global export restrictions on domestic prices in South Asia is relatively minor (Table 10), confirming the region’s small share in total world trade and that the economies of South Asia are still relatively disconnected from the global market.

Figure 2. Evolution of Consumer Price Index: Bangladesh (Deviations from Baseline)



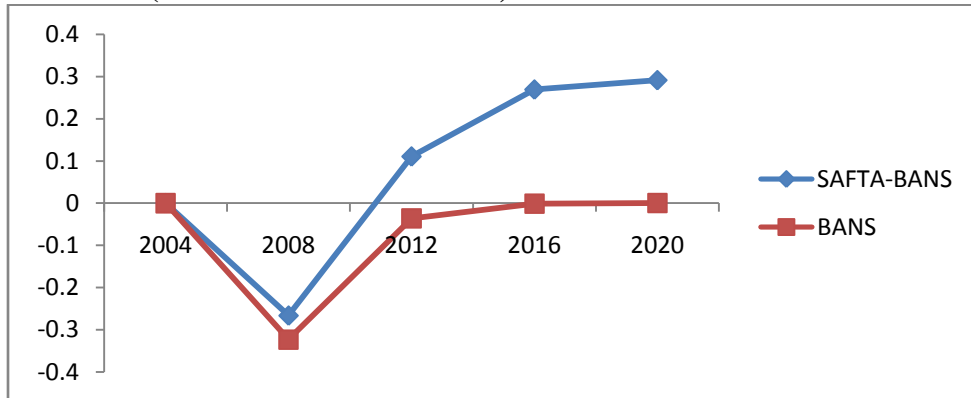
Source: Simulation Results

**Figure 3. Evolution of Consumer Price Index: India
(Deviations from Baseline)**



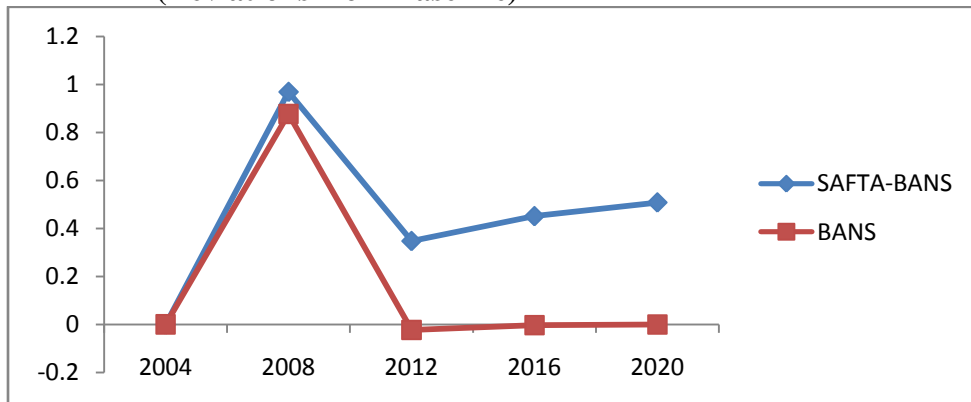
Source: Simulation Results

**Figure 4. Evolution of Consumer Price Index: Pakistan
(Deviations from Baseline)**



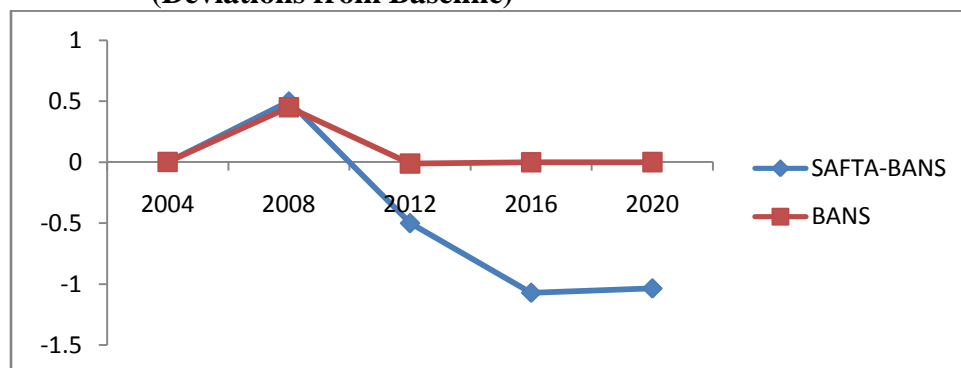
Source: Simulation Results

**Figure 5. Evolution of Consumer Price Index: Sri Lanka
(Deviations from Baseline)**



Source: Simulation Results

**Figure 6. Evolution of Consumer Price Index: Rest of South Asia
(Deviations from Baseline)**



Source: Simulation Results

Essentially, under SAFTA-BANS, the variation in CPI across South Asian countries in 2008 is best explained by looking at Table 10, which shows the changes in the domestic price of the four key commodities (paddy rice, cereals, wheat and milled rice) subject to export taxes. In 2008, the domestic prices of the all key commodities increase in all countries except in Pakistan and India. The main reason behind this is that both India and Pakistan exports these items intensively relative to other South Asian economies¹⁰. As a result, when export taxes are imposed on processed and paddy rice, both Pakistan and India reallocate their exports supply towards their domestic market. Thus, domestic prices for these commodities in India and Pakistan fall as the domestic market is now flooded with higher supply. This is not the case for Bangladesh, Sri Lanka and the Rest of South Asia which mainly imports these commodities. Export restrictions not only increase import prices but also suppress import supply from India and Pakistan, resulting in consumers in Bangladesh, Sri Lanka and the Rest of South Asia reallocating towards their domestic market. Thus, domestic demand is now higher than domestic supply, thereby resulting in higher domestic commodity prices.

Let us close this section by shedding light on which among the SAFTA scenarios would be most beneficial for South Asia as a whole. Based on the evolution of both consumer prices and real income gains across South Asian countries, it appears that SAFTA-SUB, the scenario which combines the SAFTA agreement with the elimination of all trade distorting subsidies within South Asia is the best alternative among all. Indeed, it is the most development friendly

¹⁰ India and Pakistan accounts for 8.7 and 3.7 percent of total world paddy rice exports; and 14.6 and 7.6 percent of total world processed rice exports (Narayanan and Walmsely, 2008).

scenario as aside from all countries achieving real income gains overtime, it is SAFTA LDCs Bangladesh and the Rest of South Asia that benefits more.

**Table 6. Variation in Domestic Commodity Prices
(Deviations from baseline, in 2008)**

SAFTA-BANS					
	Bangladesh	India	Pakistan	Sri lanka	South Asia
Paddy Rice	3	-1	-4.1	10.6	1.9
Wheat	2.4	0.6	1.5	8.3	2
Cereals	1.4	0.6	2.4	1.3	1.6
Rice	2.2	-0.4	-12.4	9.6	1.5
BANS					
	Bangladesh	India	Pakistan	Sri lanka	South Asia
Paddy Rice	0.5	-1.7	-12.7	9	0.9
Wheat	2.2	-1.4	-0.6	3	0.4
Cereals	13	-1.6	-0.6	15.9	1.5
Rice	0.5	-0.6	-18.8	8.1	0.7

Source: Simulation Results

5. Concluding remarks

The literature on the desirability of regional free trade in South Asia has been replete with skepticism and much uncertainty. Skeptics argue that taken in isolation, the economic case for SAFTA remains weak as South Asian countries are only classified as moderate “natural trading partners”; the region is small relative to per capita income and share in world trade; and SAFTA agreement includes extensive list of sensitive products (Panagariya, 2003 and 2007; Pitigala 2005; Baysan et al. 2006). Whereas theoretical analysis has maintained this skeptic stance, empirical analyses show moderate to optimistic results.

Gravity models have provided empirical light on this issue. However, they are not capable of accounting for economic feedback arising from economy-wide resource allocation effects. As a result, the use global CGE models to analyze SAFTA proliferated especially since the year 2000. While helpful, most of these CGE based studies are based on great simplification suffering from comparative static analysis and immediate full tariff elimination without regard to SAFTA’s temporal and tiered tariff reduction. Moreover, the existing literature has focused mostly on trade diversion issues and economic viability of SAFTA with no analysis being made in so far as the food price mitigating potential of regional trade cooperation in South Asia.

This paper fills the gap in the literature by using MIRAGE, a dynamic global CGE model complemented by detailed tariff line information from the MAcMap database. We add rigor to the analysis of SAFTA by not only accounting for capital accumulation and growth effects but also tracking the evolution of SAFTA from 2006 until 2020. We step up the analysis a few notches more by simulating the possible effects of global export related restrictions on Paddy rice, Wheat, Cereals, and Processed rice which are important commodities in South Asian.

Our findings confirm that SAFTA leads to moderate gains among its members and barely makes a dent on global trade. The former is due to small intra-regional trade flows in the region, while the latter arises from the region being a small, although emerging player in global trade. All South Asian countries gain marginal improvements in real income from SAFTA, except Bangladesh, which suffers a slight real income loss due to terms of trade deterioration due to its initially high protection levels—notwithstanding its allocation efficiency gains.

SAFTA is trade diverting from the rest of the world as intra-regional trade flows increase significantly. However, this significant growth needs to be treated with caution as base intra-regional trade is relatively small. A SAFTA scenario that includes sensitive products significantly increases the real income gains especially for Sri Lanka, but smaller LDC economies Bangladesh and Rest of South Asia suffer real income losses over-all.

The SAFTA agreement alone could not counter the effects of high global food prices, due to the region's small share in world trade. Whereas, this negative food price impact is tempered by SAFTA's tariff reduction over time, its short-term impact should raise an alarm that similar restrictions may bring about abrupt changes to South Asia's growth potential, induce further consumer price volatility and result in food insecurity. This is particularly worrisome for Afghanistan, being classified as one of the most food insecure economies in the world by the United Nations.

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