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The Welfare Impact of Unilateral and Regional Trade Liberalization in South Asia: The Way Forward

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Abstract

During the last couple of decades, trade policy reforms have been initiated in almost all South Asian countries with a view to integrating with the world economy and improving their growth prospects. This paper provides a quantitative assessment of the likely implications of trade liberalization in South Asian economies, using a multi-country CGE model with enhanced multi-household framework. The study examines the impact of trade liberalization in South Asian countries on the economies of South Asia, with particular emphasis on trade and welfare impacts of unilateral trade liberalization and South Asian Free Trade Agreement (SAFTA). The findings revealed that, amongst the two trade policy options considered, unilateral trade liberalization ensures the highest welfare to all South Asian members in compared to SAFTA. Furthermore, the results indicate that overall household income will increase in all South Asian countries under both trade policy options considered though the gains are greater under the unilateral trade liberalization. The industry level projections indicate that, exports and imports increase significantly in all South Asian countries under unilateral trade liberalization than under the SAFTA both in the short-run and long-run. Thus, unilateral trade liberalization may be likely to expand the total trade in South Asia in the world market.

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Keywords

Multi-Country CGE Model; Welfare impacts; Regional and Unilateral Trade Liberalisation

JEL Classifications: F15, F 13, F47, H31, H60

Introduction

Increased participation in global trade has been an important determinant of economic growth for leading economies in the world. In 1991 Larry Summers proclaimed that countries should pursue trade openness via all types of tariff reduction, be they unilateral, multilateral, or bilateral. Summers argued that while global liberalization may be superior, regionalism is highly likely to be of merit and could just as easily accelerate general liberalization as hindered it. Unilateral trade liberalization refers to a country going on its own; that is, removing trade barriers without waiting for its trading partners to do the same (Panagiriya, 2004). Since 1950 there has been immense liberalization of world trade, first under the auspices of the General Agreement on Tariffs and Trade (GATT), established in 1947, and now under the auspices of the World Trade Organization (WTO), which replaced the GATT in 1993. Tariff levels in developed countries have been reduced dramatically by 2007, the average tariffs were reportedly slashed down to four per cent (World Bank, 2010). It has also been recorded that there is a reduction in simple average tariff levels in developing countries even though it still remains relatively high at an average of 15 per cent in low and middle-income regions like South Asia and Sub-Saharan Africa (World Bank, 2010). Non-tariff barriers to trade, such as quotas, licenses and technical specifications, are also being gradually dismantled, but rather more slowly than tariffs.

In line with trends in the other economies, South Asia has been actively engaged in trade liberalizations over the last decade, both regionally and unilaterally. On a regional basis, the economies of South Asia have sought to promote intra-regional trade as a group, in addition to pursing agreements with economies outside the region. In December 1985, seven South Asian countries: Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka formed the South Asian Association for Regional Cooperation (SAARC) to promote economic, social and cultural cooperation. In April 2007, at the SAARC's 14th summit, Afghanistan became its eighth member. In 1993 the South Asian Preferential Trade Agreement (SAPTA), (which came into effect from December 1995) was initiated by the SAARC to promote greater regional economic cooperation. Subsequently, the member countries of the SAARC intended to transform SAPTA into a South Asian Free Trade Area (SAFTA) and this arrangement was duly signed on 6th January 2004 during the 12th

SAARC summit. The treaty came into force on 1st January 2006 with plans for full implementation to be achieved by 31st December 2015.

SAFTA is intended to strengthen intra-SAARC economic cooperation and maximize the region's economic and social potential through various instruments of trade liberalizations. The agreement binds all contracting states to reduce tariffs to 0-5 per cent by 31st December 2015. South Asian countries have been slowly moving towards a SAFTA in recent years. Even though regional integration initiatives commenced with the formation of the SAARC, intra-regional trade in the region is very low and remained at 4.3 per cent in 2015 (World Bank, 2016), Direction of Trade Statistics, 2016). The official data indicates that the industrial countries continue to assume a major share of region's trade, while developing countries outside South Asia have been the second most important group (World Bank, 2017). This is a serious impediment for regional cooperation and economic integration and therefore, it is important to apply the right policy measures to boost intra-regional trade among the SAARC members. In this context, it has become a vital policy issue to determine whether the creation of SAFTA and unilateral trade liberalizations would ensure greater welfare gains for all South Asian members. The paper itself is divided into five main parts. Section 2 provides the contextual setting by explaining the key characteristics of South Asian economies. Section 3 describes the structure of the model, database development and the experimental design of the study. The results of the alternative trade policies are presented and discussed in Section 4. Concluding remarks on policy implications are given in Section 5.

Characteristics of South Asian Economies: An Overview

The South Asian region includes Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. The World Development Report in 2017 indicated that the region has about 23 per cent of the world's population and 15 per cent of the world's arable land, but only about 2.7 per cent of GDP, 1.8 per cent of world trade, and less than 4 per cent of world foreign investment flows.

Table 1: Economic Indicators of South Asian Countries -2017

	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
Land Area (‘000 sq km)	652.86	130.17	38.12	2973.19	0.30	143.35	770.88	62.71
Population (million)	35.53	164.67	0.807	1339.18	0.436	29.30	197.015	21.44
Rural Population (% of total population)	74.75	64.14	59.83	66.4	60.62	80.66	63.55	81.61
Poverty headcount ratio at national poverty lines (% of population)		24.3	8.2					4.1
GDP (US$ billion)	20.81	249.72	2.51	2597.49	4.59	24.47	304.95	87.17
GDP per capita (US$)	585.85	1516.51	3110.23	1939.61	10535.79	835.07	1547.85	4065.22
Real GDP growth (%)	2.3	6.2	6.3	6.1	-3.1	5.3	2.0	6.0
Distribution of GDP (%)								
- Agriculture	20.96	13.41	15.18	15.45	5.88	27.03	22.88	7.70
- Industry	21.70	27.75	39.04	26.15	9.69	13.47	17.94	27.20
- Manufacturing	11.30	17.30	7.13	14.99	2.01	5.21	11.98	18.51
- Services	53.01	53.47	39.25	48.93	70.73	51.53	53.09	55.77
Total Exports (US$ million)	1342.63	37548.75	654.10	490079.4	3347.16	2388.02	25114.13	19116.94
Total Imports (US$ million)	9544.68	50613.76	1205.47	565594.9	3567.59	10282.29	53527.25	25402.51
Current Account Balance (US$ million)	-4683.1	-6364.81	-546.13	-39072.6	-876.4	-815.32	-15818	-2309.38
Current Account Balance (% GDP)	-22.49	-2.54	-21.74	-1.50	-19.06	-3.33	-5.18	-2.64
Merchandise Trade (% of GDP)	40.73	35.55	63.29	28.70	58.55	45.97	26.00	36.92
Foreign Direct Investment (% of	0.25	0.86	-0.65	1.53	11.25	0.80	0.92	1.57

GDP)								
Inflation, GDP Deflator (%)	4.87	6.27	7.54	2.99	0.03	7.58	4	8.24
Unemployment Rate (%)	8.83	4.36	2.43	3.52	4.99	2.73	4.04	4.07
Gross Savings (% of GDP)	18.09	35.23	24.88	32.09	5.28*	44.36	20.10	33.89

Source: World Bank, World Bank Statistics 2017 *Maldives (International Monetary Fund)

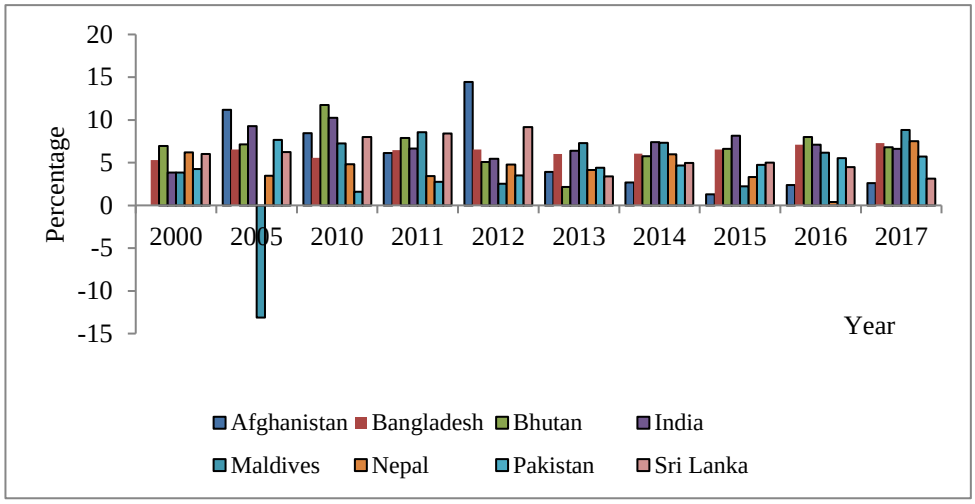
The South Asian region is tremendously diverse in terms of country size, economic and social development, geography, political systems, languages, and cultures. This diversity in culture, language and political practices also makes individual countries unique in the region. Table 2.1 shows the key economic indicators for the South Asian economies. The South Asian region consists of a single large country, India, surrounded by a number of medium and small nations including Pakistan, Afghanistan, Bangladesh, Nepal, Bhutan, Sri Lanka and Maldives. According to the statistics listed in Table 2.1, India's population in 2017 was 1.33 billion and GDP was about US$ 2597.49 billion, approximately 3 and 4 times, respectively, of the combined population and GDP of the other seven South Asian countries. The World Bank classifies Sri Lanka and Maldives as upper middle-income countries, India, Pakistan, Bangladesh and Bhutan as lower middle-income countries (LMC) and the other two South Asian countries as low-income countries (LIC). Today, South Asia, as a region, is generally characterized by backwardness and low per capita incomes, a high incidence of poverty and poor infrastructure. South Asia is one of the poorest regions in the world and, after Sub-Saharan Africa, is home to the largest concentration of the world population living in poverty (World Bank, 2017).

Development Trends in South Asia

- **Economic Growth and Stability**

Over the last few years, South Asia has been one of the fastest growing regions in the world. Between 2000 and 2004, the region registered an annual real GDP growth rate of 5.6 per cent, which was higher than the average annual growth rate of Southeast Asia of 4.9 per cent but slightly below East Asia's (the fastest growing region) 6.8 per cent (World Bank Database, 2008). In 2007, real GDP growth in South Asia accelerated to 8.6 per cent per annum, higher than Southeast Asia's 5.6 per cent and slightly below East Asia's 10.4 per cent. (World Bank Database, 2008). However, in 2009 the growth rates have declined in most South Asian countries, mainly due to the global financial crisis. Figure 1 illustrates the average economic growth rates of the South Asian countries from 2000–2017.

Figure 1: Economic Growth in South Asia



Source: World Bank, World Development Indicators Data Base, 2017

The improved overall economic performance of the region is a reflection of structural reform and the adoption of liberalization policies by most South Asian countries from the mid-1980s onwards. Such reforms encouraged market forces and the private sector to play a more prominent role in driving the economies, compared with the state-led development models of the 1960s and 1970s.

- **Trends in Sectoral Composition of GDP**

Table 2 illustrates the trends in sectoral composition of nominal GDP in South Asia from 1990-2016. According to the figures, it is apparent that the share of the manufacturing sector in output did not rise in tandem with the fall in the share of the agricultural sector over the same period. Conversely, it is noticeable there is a remarkable increase in the service sector in all South Asian economies over the period concerned.

Table 2: Trends in Sectoral Composition of GDP: 1990-2016

Country	Agriculture as % of GDP			Manufacturing as % of GDP			Services as % of GDP		
	1990	2000	2016	1990	2000	2016	1990	2000	2016
Bangladesh	30	22	14	13	14	17	46	50	53
India	27	21	16	17	16	15	34	41	48
Nepal	49	38	29	6	9	5	30	34	50
Pakistan	23	24	23	15	13	12	43	47	52
Sri Lanka	26	20	7	13	15	18	46	52	57
South Asia	27	22	16	16	16	15	36	42	49

Source: World Bank, World Development Indicators Data Base, 2017

The agricultural sector continues to play a very important role in South Asia, particularly in the employment of a vast majority of labor force. Though the share of agriculture in nominal GDP declined from 27 per cent in 1990 to 16 per cent in 2016, nearly 55 per cent of the labor force is engaged in this sector (World Bank, 2017). Agricultural trade is characterized by similar types of export and import products, and a high concentration on few products. For instance, the top five exports account for more than 60 per cent of total agricultural sector exports in South Asia (World Bank, 2016). Trade liberalization reforms contributed to a significant extent in enabling South Asian countries to develop their manufacturing sectors by exposing them to larger markets, for instance for readymade garments exported to the USA and EU. Accordingly, about 85 per cent of South Asian manufactured exports consist of resource-based or labor-intensive items dominated by food products and textiles. A lack of a literate and technically skilled and trained labor force, inadequate transportation and communication infrastructure, energy shortages and lack of a favourable business environment may restrict the expansion of the manufacturing sector in such economies. The services sector is the most dynamic component of the South Asian economies at present and a major driver of the regional economic growth. In 2016, services industries contributed 55 per cent of the GDP and the share of employment also increased from 28.8 per cent in 2000 to 35.3 per cent in 2016 (World Bank, 2017).

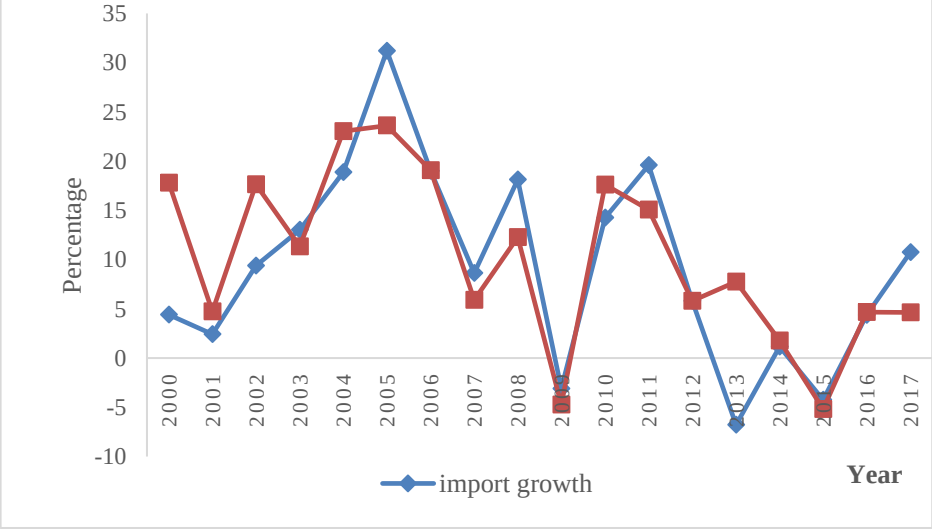
Trade and Investment Trends in South Asia

An important debate is under way among the countries of the world about the relative merits of pursuing regionalism through preferential trading arrangements versus more outward-oriented approaches to expanding trade and investment. This debate has significant implications for the dimensions of economic welfare and poverty alleviation in developing countries. Therefore, it is important to examine the trends in trade and investment in the South Asian economies.

- **Trends and Patterns in External Trade**

South Asia has moved away from import substitution to more liberal trade and export promotion policies. Consequently, its international trade has grown very rapidly. Figure 2 illustrates the growth in exports and imports in South Asia over the period 2000-2017.

Figure 2: Exports and Imports Growth in South Asia: 2000-2017



Source: World Bank, Database (2017)

The progress of the trade reforms has meant that South Asian economies have integrated more with the global economy. The collapse of the Soviet Union and the success of China under outward-oriented policies convinced policymakers in the South Asian region that rapid growth could not be achieved without wholesale opening of trade regimes. Unilateral trade liberalization policies, which had begun to be introduced in the second half of the 1980s, were introduced on a more systematic basis in the 1990s. These changes contributed to a more rapid expansion of South Asia's trade with the outside world. Their largest trading partners, accounting for more than 50 per cent of their total trade, are the major industrial countries in the European Union, along with the United States and Japan. A substantial portion (40 per cent) of the region's trade is with countries in the Asia-Pacific region, including China, the Southeast Asian countries, Australia, New Zealand, and the high-income East Asian countries (Hong Kong, Japan, South Korea, Singapore, and Taiwan).

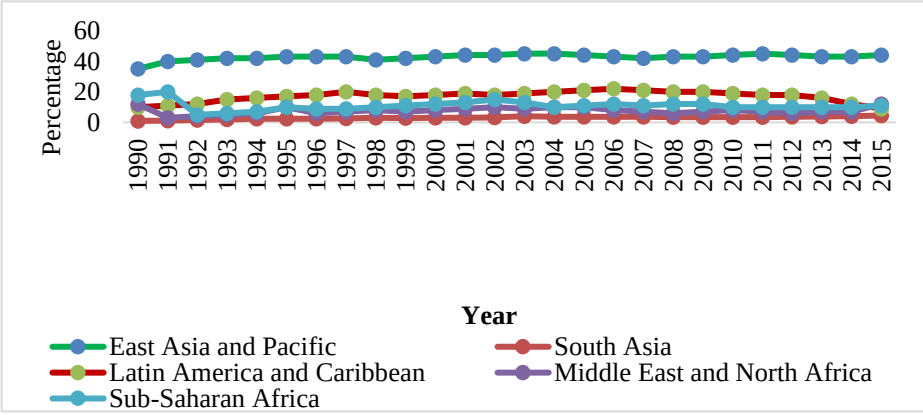
Figure 2 shows that growth rates in exports and imports increased significantly during the early 1990's. However, these double-digit growth rates in exports and imports declined drastically in the mid-to-late 1990s due to a change in South Asia's competitive position in the world market. Most South Asian countries produce and export labor-intensive products, and countries such as India, Pakistan, Bangladesh, Sri Lanka and Nepal compete with China in the production of labor-intensive manufactured goods. The services sector comprises more than one-quarter of South Asia's total exports. India's pioneering efforts in the provision of off-shore information and communication technology (ICT) and business process services expanded rapidly in the early 2000s with India becoming one of the key out sourcing markets in the world (Gupta, et al., 2010).

- **Intra-Regional Trade in South Asia**

Despite efforts to strengthen regional economic cooperation through SAFTA, intra-regional trade was only 4.8 per cent of total trade in 2015, though there have been fluctuations around this level since SAPTA's formation in 1995. Figure 3 depicts the intra-regional trade of the South Asian countries as a percentage of total trade.

From the Figure 3, it is clear that intra-regional trade in South Asia has remained in the bandwidth of 3-5 per cent of its total external trade in the last 26 years. Several factors have contributed to the low intra-regional trade in South Asia. They are existence competitive trade structure than complementary trade structure, including long sensitive lists, Pakistan's positive list approach to India and prevalence of non-tariff barriers (Rahman et al., 2010). Thus, intra-regional trade in South Asia remains insignificant as a proportion of the region's total external trade

Figure 3: Intraregional Trade as a Share of Total Trade



Source: World Bank (2018), A Glass Half Full: The Promise of Regional Trade in South Asia, South Asia Development Forum.

- **Investments in the South Asian Region**

The impacts of Foreign Direct Investment (FDI) on economic growth have been debated quite extensively in the literature. The 'traditional' argument is that an inflow of FDI improves economic growth by increasing the capital stock, whereas recent literature points to the role of FDI as a channel of international technology transfer (Lensink and Morrissey, 2001). Further, it has been pointed out that when countries liberalize their economies, it could attract more FDI inflows, which would result in accelerating economic growth and poverty reduction in the economy (Alfaro, 2003). Most South Asian countries undertook far-reaching economic reforms in the 1990s and have adopted industrial policies that encourage FDI inflows. Table 3 illustrates the FDI inflows to South Asian countries during the period 1997 to 2016.

Based on the information in Table 3, the developed economies attracted 59.1 per cent and developing economies 37.0 per cent of global FDI inflows in 2016. The amount of FDI inflows attracted by the South Asia region relative to East Asia increased considerably over the period. During 1997–1999 period, it was US$ 4.16 billion, a mere 0.5 per cent of global flows and rose to 3.4 per cent in 2009, which is about 240 per cent increase. FDI flows to South Asia excluding India was just only 0.6 per cent of the global flows. Overall it appears that even though FDI inflows as a percentage of global flows to the South Asian region has been increasing, its share in global flows is still relatively low in comparison with other regions in the world.

Table 3: FDI Inflows as a Percentage of Global Flow: 1980–2009

Region/Country	1997-9[1]	2000-4[1]	2005	2009	2014	2015	2016
Developed economies[2]	72.1	71.4	62.4	50.8	42.6	55.5	59.1
Developing economies[2]	26.5	26.3	33.2	42.9	53.2	42.4	37.0
Africa and the Middle East	1.4	1.9	3.1	5.3	5.4	3.5	3.4
Latin America & Caribbean	11.4	8.9	8.0	10.5	12.8	9.3	8.1
Transition economies[3]	1.4	2.4	4.4	6.3	4.3	2.1	3.9
Developing Asia	13.2	14.3	17.7	27.0	34.8	29.5	25.3
East Asia	8.9	10.6	12.3	13.9	19.4	17.9	14.9
China	5.7	6.1	7.7	8.5	13.4	13.0	12.3
Hong Kong	2.2	3.4	3.6	4.3	10.7	8.5	6.3
South-East Asia (ASEAN)[4]	3.7	2.9	4.3	3.3	9.9	7.1	5.8
South Asia	0.5	0.7	1.0	3.4	3.1	2.9	3.1

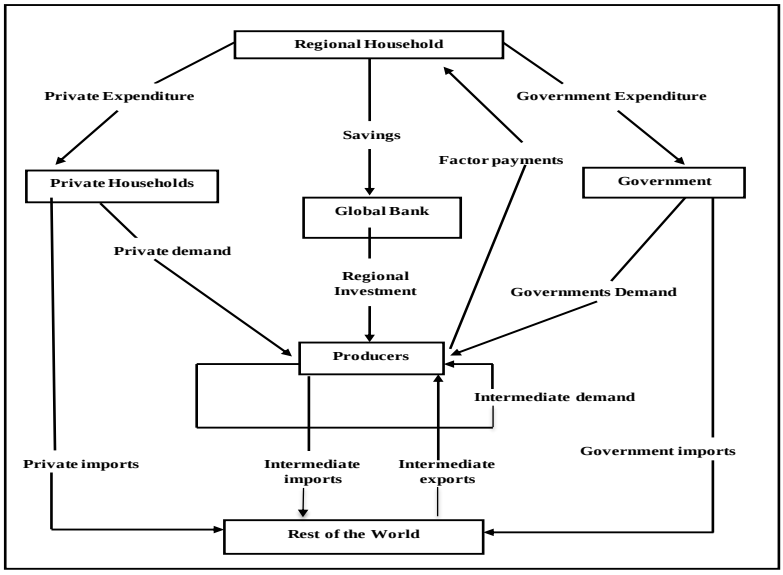
Source: Compiled from UNCTAD World Investment Database
Note 1: Annual averages
Note 2: Based on the United Nations standards classification
Note 3: Transition economies in Central and Eastern Europe
Note 4: Member countries of the Association of Southeast Asian Nations

Database and the Model Construction

The Model

This section presents the theoretical framework of the South Asia multi-country, multi-sector static Computable General Equilibrium Model (SAMGEM) which is used to examine the impact of regional integration (SAFTA) and unilateral trade liberalization on trade and welfare of the economies in South Asia region. Its framework and database are basically the same as the Global Trading Analysis Project (GTAP) model. Given the complexity of the GTAP model, it is useful to provide a graphical overview of its basic structure before incorporating any changes to construct the SAMGEM. Figure 4 presents the basic value flows of the standard GTAP model. Each region in the global model is endowed with primary factors of production, land, capital, skilled and unskilled labor and natural resources. These non-labor primary factors are either used in producing goods in the same region where these factors are located or are permitted to move to other regions in response to factor price changes. Labor is mobile across sectors only at the regional level. The modelling of each region in GTAP based on the ORANI model and also based on the assumptions of constant returns to scale in production and perfect competition in commodity and factor markets.

Figure 4: Overview of the GTAP Model



Source: Adopted from Brockmeier (2001)

In the above diagram, it is assumed that there is no depreciation or government intervention in the form of taxes and subsidies. At the top of the Figure 5 one can identify regional households who have fixed endowment with primary factors of production (land, labor, capital and natural resources). Since, there is no government intervention, the only source of income for regional households is from sales of factor endowment to producers, which yields factor payment in return. In the GTAP model, regional households have an aggregate utility function, which allocates regional income across three broad categories, i.e. private household expenditure, government expenditure and savings. The formulation of regional households in an AGE (Applied General Equilibrium) model has an advantage as it could provide a useful indicator to measure overall regional welfare. This means, when regional income rises, the regional utility function considers not only the private household expenditure but also government purchases and savings (Hertel and Tsigas, 1997; Lotze, 1998).

In the GTAP model, private households spend their income on domestic as well as imported goods, and the same is applied to government sector who demand domestic and imported goods in order to produce public goods and government services. On the other hand, producers combine primary and intermediate inputs to satisfy this final demand. They also demand intermediate inputs and supply export commodities to the rest of the world. The model allows the user to distinguish bilateral exports and imports by destination and source region. Furthermore, imports are distributed among specific domestic user groups, i.e. private households, government and firms, which is important in analyzing trade policy issues.

Finally, there are two global sectors in the GTAP model. Firstly, the global bank collects savings from regional households and allocates these funds among regional investments and, therefore, this provides the macroeconomic closure of the model. In addition, the producers who produce final commodities also supply capital goods, which are formed as part of investments. The global bank collects these investment goods produced by the producers and distributes them to regional households in the form of shares from the global portfolio to satisfy their demand for savings. The second global sector is the global transportation sector, which acts as an intermediary between the supply of, and demand for, international

transportation services. In the GTAP model the transportation cost is calculated from the value of exports at FOB (free on board) prices whereas imports are valued at CIF (cost, insurance and freight) prices. Moreover, the global transport sector supplies all the demand for (the import of) trade and transport margins, and then purchases all the supply of (the export of) trade and transport margins to balance the transport market (Hertel and Tsigas, 1997).

Policy Simulations

This section outlines the simulations designed to identify the short-run and long-run impacts of trade liberalization in South Asia with the objective of deciding the best trade policy outcome for South Asia in promoting regional economic integration and thereby reducing poverty in the region.

a) Simulation 1: South Asian Free Trade Area –SAFTA

This simulation considers full implementation of the SAFTA in its originally proposed form where all SAARC countries reduce their existing tariff rates to zero per cent while import protection between the rest of the world and the SAARC is maintained.

b) Simulation 2: Unilateral Trade Liberalisation in South Asia

The prior discussion raises the question as to whether SAFTA creates welfare gains to its members or not? This is because nearly two decades after regional initiatives took place in South Asia, the region's intra-regional trade as a share of total trade has not increased from the 5 per cent level witnessed in the 1980s and 1990s (Ratna and Sidhu, 2007). This implies that South Asia trades heavily with the countries outside the region. Furthermore, Dash (2009) pointed out that, SAARC countries export the bulk of their primary commodities and manufactured goods to the same world markets. Hence, they tend to compete in the same industrial sectors with each other. Additionally, most of SAARC members' trade is with the United States and Europe rather than with their regional trading partners. Given the small size of markets of South Asian countries, with India as an exception, there is limited scope for mutually beneficial market exchange among South Asian countries. Hence, most South Asian economies lack incentives to seek regional trade liberalization.

The empirical evidence suggests that, some (Panagariya, 2003; Bandara and Yu, 2003; Bhagawati, 2008) embrace a pessimistic view about the SAFTA and alternatively argue that unilateral or multilateral trade liberalization would be the best trade policy option for South Asia. Conversely, the supporters of SAFTA point out that despite the potential for trade diversion, SAFTA would bring significant benefits to small countries in the region and would facilitate unilateral trade liberalization in South Asia (Mukherji, 2004, Newfarmer 2004)

Answers to these questions require an extensive examination of impacts of SAFTA and unilateral trade liberalization on the member countries of South Asia. Like in the case of Bandara and Yu (2003), this simulation considers the possibility of all South Asian countries unilaterally removing all their tariffs against all countries in the world, while the rest of the world retains tariffs against South Asia.

Model Closure

This section describes the main aspects of the model's closure. In formulating a model, it is necessary to select which variables will be endogenously determined within the model and which are to be treated as exogenous. The exogenous variables of the model must be selected based on the economic environment in which the policy is tested which best reflects the true economic environment in which the policy is applied.

From the above discussion, it was noted that the simulations will be performed in two different economic environments or closures: short-run and long-run. These closure rules define the equilibrium conditions in the included markets in the model and also determine the expected time period of the solution. The SAMGEM is based on the standard static GTAP model and the model closure rules of the GTAP model are widely available (Hertel and Tsigas (1997). Hence, this section focuses on the model closure rules, relating to SAMGEM which depart from those in the standard GTAP model. The standard closure rules for the GTAP model were adjusted to provide a better reflection of the economies in South Asia. The short-run and long-run closures for the SAMGEM are based on the short-run and long-run closures developed by Dixon, Parmenter and Rimmer (1981) and Horridge and Powell (1984) for the ORANI model. The set of assumptions used in the short-run and long-run economic environments are given below.

- **Short-Run Closure**

The assumptions of this closure are made to retain the realities of the South Asian countries' labor markets and other macro constraints in the short run. Three fundamental changes were made to the closure of the standard GTAP model: the first was related to fixing the trade balance, the second to employment of labor and the real wage rate and the third to the physical capital stock and real rental rate of capital.

In the short-run it is assumed that trade balance is fixed with real consumption, investment and government spending moving together to accommodate it (Horridge et al., 2006). South Asian countries are endowed with excess supply of especially unskilled labor which can be drawn on by industries in the event of increased production of export-oriented industries due to trade liberalization. Hence, in South Asia and the rest of the world, employment is allowed to change in the short-run as firms can employ more labor while the real price of labor is fixed. On the other hand, in the capital market the capital stock in each sector is held fixed, with real rates of returns to capital adjusting endogenously. The same applies for land and natural resources, which are included under capital in the model. In line with many other CGE simulations the short-run is considered as a period between 1-2 years.

- **Long-Run Closure**

The assumptions of this closure are made to retain the realities of the macroeconomic environment of the South Asian economies and the rest of the world in the long-run. Accordingly, under this closure, capital stock can vary while labor supply is assumed to be fixed. This reflects that capital can adjust over time with the natural rate of unemployment. Under this scenario the real price of labor is allowed to vary while the real price of capital remains fixed. In addition, the trade balance, real consumption, government consumption and investments become endogenous in the model. Furthermore, both in the short-run and long-run, production technologies, the number of households, all policy variables (taxes and subsidies) and shift variables in household consumption are assumed to be exogenous. Since the model can only be solved for (n-1) prices, one price is set exogenously, and all other prices are evaluated relative to this numéraire (Brockmeier, 2001). Accordingly, as in the standard GTAP model the global average rate of return to primary factors is used as the numéraire in the model.

Analysis of Modelling Results

The modelling assessment and results of SAMGEM require careful explanation. The chronological interpretation of results no doubt demand meticulous and discreet application of economic theory. Little wonder Adams in his article mentioned that 'the interpretation of results of a CGE model in terms of a logical sequence of connections is a challenging task in itself' (Adams, 2005). In interpreting modelling results, two tasks need to be accomplished. The first deals with the complexity of the modelling results and the second to proof that the result produced are in fact reliable and defendable. This is especially important since the present study considers two trade policy options and each policy needs to be analyzed in short-run and long-run frameworks.

As tariff reform affects all sectors in the economy, to keep the analysis concise, it is imperative to select the most significant sectors and variables to be examined under each policy option. The best policy outcomes are determined on the basis of the equivalent variation (EV) that arises under each of the simulated policy outcomes.

Macroeconomic Effects

The sound knowledge on the impact of macroeconomic variables of a given policy shock is essential as it affects all sectors in the economy. When analyzing the macroeconomic results it is important to identify the implications on key variables such as real GDP, aggregate employment, real factor prices, consumer price index, and terms of trade, trade volumes and per capita household utility in the economy. Table 4 illustrates the projected macroeconomic results under different policy simulations. Interpretation of macroeconomic results begins with short-run effects.

Table 4: Projected Macroeconomic Results Under Different Policy Experiments

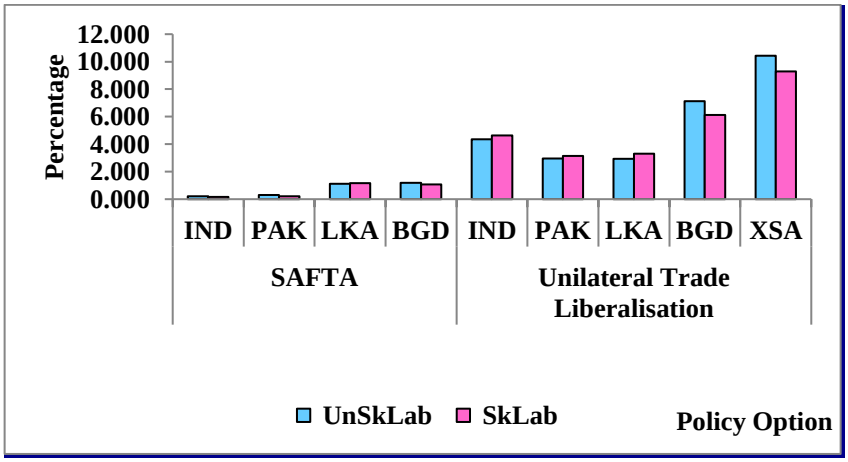
Macroeconomic Variable	Change in real GDP (%)		Change in Terms of Trade (TOT) (%)		Change in volume of Exports (%)		Change in volume of Imports (%)		Change in Trade Balance (US Million)		Change in per capita utility (%)		Change real wages (unskilled) (%)		Change real wage rate (skilled) (%)		Change real rental rate (%)	
Region	**SR**	**LR**	**SR**	**LR**	**SR**	**LR**	**SR**	**LR**	**SR**	**LR**	**SR**	**LR**	**SR**	**LR**	**SR**	**LR**	**SR**	**LR**
SAFTA																		
India	0.13	0.18	0.26	0.28	1.04	0.95	1.07	1.18	0.00	-215.97	0.20	0.23	0.00	0.27	0.00	0.18	0.19	0.00
Pakistan	0.19	0.29	0.18	0.19	1.71	1.68	1.16	1.45	0.00	-83.62	0.26	0.35	0.00	0.46	0.00	0.36	0.33	0.00
Sri Lanka	0.76	1.58	0.06	-0.21	6.42	8.01	4.97	6.70	0.00	-71.12	0.85	1.39	0.00	1.83	0.00	1.91	1.37	0.00
Bangladesh	0.86	0.71	-1.10	-0.91	8.07	6.85	5.68	5.56	0.00	-94.93	0.68	0.48	0.00	0.98	0.00	0.92	0.87	0.00
Rest of South Asia	2.93	2.46	-0.70	-0.94	10.85	13.72	5.18	3.74	0.00	154.74	3.03	2.05	0.00	3.48	0.00	2.63	3.47	0.00
Unilateral Trade Liberalization																		
India	3.11	3.99	-4.28	-3.18	24.76	19.11	16.76	20.21	0.00	-9120.21	2.47	3.18	0.00	5.41	0.00	4.75	3.72	0.00
Pakistan	2.77	4.59	-3.84	-3.08	22.24	18.88	11.26	17.87	0.00	-2226.96	1.44	3.29	0.00	6.16	0.00	6.09	4.19	0.00
Sri Lanka	1.99	4.07	-1.75	-2.12	15.17	17.43	10.47	15.37	0.00	-342.75	1.12	2.65	0.00	4.95	0.00	5.46	3.41	0.00

Bangladesh	5.17	5.23	-6.04	-4.94	41.76	34.48	29.25	30.00	0.00	-766.49	4.22	3.88	0.00	6.57	0.00	5.82	5.90	0.00
Rest of South Asia	6.18	6.12	-3.78	-4.27	21.83	27.99	9.87	8.16	0.00	252.72	4.88	3.72	0.00	7.98	0.00	6.95	8.12	0.00

Source: Simulation results derived from the SAMGEM Note: SR= Short-run effects LR=Long-run effects

First, the overall impact on the macro economy is indicated by change in real GDP and the employment. The results indicate that under all three policy options there are positive impacts on real GDP in all South Asian economies in the short-run. It is noted that the gains in GDP are higher with the unilateral trade liberalization than under the SAFTA zero tariff agreement. Moreover, the short-run gains in GDP are higher for least economies in the region (Bangladesh and Rest of South Asia). For instance, under the SAFTA, real GDP in India increases by 0.13 per cent whereas in the Rest of South Asia the same will increase by 2.93 per cent. On the other hand, under the unilateral trade liberalization gain in GDP for India is 3.11 per cent where as for the Rest of the South Asia GDP increases by 6.18 per cent. This is because apart from the least developed countries in the region, these economies have high pre-liberalization levels of protection against imports in comparison to India, Pakistan and Sri Lanka. Hence although Preferential Trade Agreements would bring benefits to all countries in the region, moving to unilateral trade liberalization would bring significant gains to South Asia. The long-run projections in real GDP stipulate that the gains for all South Asian economies are generally higher in comparison to the short-run under the both policies. Hence, these results demonstrate the widely held notion of growth stimulation effects of trade liberalization as established in the literature (Davis, 1996).

Figure 5: Changes in Employment Under Different Policy Experiments in the Short-Run



Source: Simulation results derived from the SAMGEM

Figure 5 indicates that employment will increase in all South Asian countries under the both trade policy options. In addition, it is noted that employment will increase substantially under the unilateral trade liberalization in all South Asian countries and this result is consistent with changes in real GDP in respective economies.

Furthermore, it is obvious that more employment opportunities will be created for the least developed economies in the region (Bangladesh and Rest of South Asia) under all both trade policy options due to expansion of labor-intensive industries in the short-run. The removal of quantitative restrictions through trade liberalization will encourage a shift of resources from production of imports substitutes to the production of export-oriented goods. So, it is possible that the industries which are selling their products to the export market will benefit due to trade liberalization. Since, South Asian countries specialize in labor intensive manufacturing products such as textiles, garments, footwear and leather products, it could be expected that an increase in demand for labor will occur in such industries.

In general, tariff reforms directly affect relative prices (import/domestic) which in turn change CPI. Understanding the change in relative prices will help to explain the impact on demand for imports relative to demand for domestically produced goods. Table 5 illustrates there is a reduction in the CPI under different trade policy options in all regional partners except in India and Pakistan under the SAFTA. India and Pakistan are the two largest economies in the region and an increase in CPI in these economies may be due to an increase in demand for domestically produced goods by their domestic counterparts and other South Asian economies.

Table 5: Percentage Change in Consumer Price Index

Country/Region	SAFTA		Unilateral Trade Liberalisation	
	SR	**LR**	**SR**	**LR**
India	0.26	0.29	-4.16	-2.94
Pakistan	0.17	0.20	-4.08	-3.19
Sri Lanka	-0.35	-0.56	-3.36	-3.44
Bangladesh	-0.89	-0.74	-4.93	-4.02
Rest of South Asia	-1.22	-1.35	-6.12	-6.18

Source: Simulation results derived from SAMGEM
Note: SR-Short-run effects LR- Long-run effects

This trend is changed under the unilateral trade liberalization in these two countries (India and Pakistan) where there is a decline in CPI. The World Bank (2010) noted that the average tariff in the agricultural sector is higher in all South Asian economies. As Sri Lanka, Bangladesh and the Rest of South Asia import most of the agricultural goods and other food products from their regional trading partners, the CPI tend to decline under the SAFTA. Also, there is a greater reduction in CPI in all countries under the unilateral trade liberalization as these economies import significant amounts of intermediate goods, electronic and machinery and equipment from other countries outside the region. It is worthwhile to note that, especially under unilateral trade liberalization, the large amounts of imports cause a substantial decline in CPI in comparison to the SAFTA.

Next, it is important to examine the impact of the two trade policy options on terms of trade (TOT) in South Asian economies. The TOT effect also provides an important measurement as to how well each country could play its role in the international market due to trade reforms. It is also considered as an important component in welfare gains. Percentage changes in TOT reflect changes in export and import prices due to change in trade in each country. The results demonstrate that, under the unilateral trade liberalization scenario, TOT deteriorates in all countries in South Asia. Jomini et al. (2009) pointed out that, due to trade liberalization, the relative price of exports to imports can decrease more in small countries than in large countries, resulting in a large deterioration in the terms of trade. Since, South Asia is a small player in the world economy, TOT deteriorates largely under the unilateral trade liberalization. Bandara and Yu (2003) noted that when countries in the region liberalize their trade regimes, imports into the region, especially manufacturing goods from their trading partners, will increase. Consequently, these countries need to export more of their own products to finance their import bills. Accordingly, this would result in a reduction in their export prices and deterioration in TOT in South Asian countries under the unilateral trade liberalization.

Another important macroeconomic effect is change in volume of trade due to trade reforms, which is known as trade enhancing effects. From the simulation results it is noted that percentage change in volume of exports and imports are substantially higher under the unilateral trade liberalization in South Asian economies. This is due to the fact that South Asian countries are more involved in trading with other countries such as USA and EU than with

their regional trading partners. The results also demonstrate that the SAFTA would not significantly increase total trade in South Asian countries. However, unilateral trade liberalization would enhance trade in each individual economy in South Asia than under the regional trading agreement. As discussed in Section 3.3, the trade balance is set to be endogenous in the long run. Paulino and Thirlwall (2004) explained that although trade liberalization will raise the growth of exports and imports, the implications for the trade balance and the balance of payments are uncertain. This is because it depends on the relative impact of liberalization on export and import growth and also its impact on the prices of traded goods. It is important to note that the elasticities of supply of exports and demand for imports also play a significant role in determining growth of exports and imports in each country under the trade reforms. The long-run results (see Table 4) indicate that under the SAFTA, all South Asian countries experience a negative trade balance with the exception of the Rest of South Asia. This is because smaller economies experience the largest deterioration in TOT as a result of a fall in export prices relative to import prices causing an increase in exports relative to imports resulting into a positive trade balance.

Moreover, under the unilateral trade liberalization all economies, except the Rest of South Asia, experience a higher negative trade balance in comparison to other two trade policy options. As previously noted, larger economies in the region are trading more with the rest of the world causing more rapid expansion in imports than exports in these countries under the unilateral trade liberalization. Hence, the net effect on the trade balance in each South Asian economy depends on the magnitude of the trade creation and trade diversion effects due to tariff reductions under each trade policy option.

In examining the other macroeconomic variables, it is observed that the per-capita household utility is positive for South Asian economies under different trade policy options. Moreover, per-capita household utility increases substantially under the unilateral trade liberalization scenario in all South Asian countries, which is again consistent with change in real GDP in the respective countries.

The Impact on Sectoral Trade

This section relates to the projections on trade both at sectoral and intra-regional level for South Asian economies under different trade policy

scenarios. The description of regions and the commodities included under each industry are illustrated in Table A.1–A.3 in the Appendix.

We turn now to an examination of the impact of the trade policy options on exports and imports in different industries at the national level in both the short-run and long-run. The most obvious and immediate impact of the tariff cuts is to stimulate the demand for imports by reducing the prices of imported goods. These tariff cuts therefore can intensify the competition for the protected domestic industries. Additionally, the tariff cuts also can directly reduce the cost of intermediate inputs for the domestic industries and the prices paid by the households. Tables A.4 and A.5 illustrate the percentage change in sectoral exports and imports under different policy options in South Asian economies in the short run. The results indicate that, Indian exports of agricultural goods such as paddy rice, wheat and cereal products, oil seeds and vegetable oil, sugar, plant based fibres, dairy and milk products and beverage and tobacco are expected to increase substantially under the in comparison to manufacturing goods. India is a net exporter of most agricultural goods and is one of the main suppliers of agricultural goods to its regional trading partners.

Although there is an increase in exports of the textile industry, the exports of the wearing apparel sector in India are expected to reduce under the SAFTA. As all South Asian economies specialize in the production of wearing apparel there is not much intra-industry trade in wearing apparel among these economies under the SAFTA. Moreover, exports of agricultural goods and labour intensive manufacturing goods are substantially higher under the unilateral trade liberalization in comparison to the SAFTA as a result of greater reduction in the cost of intermediate goods and labour. This is because, India trades more intensely with rest of the world than with regional trading partners, and thus experiences a greater reduction in the cost of inputs under the unilateral trade liberalization.

On the other hand, India's imports in agricultural and labour intensive manufacturing goods will increase by a greater percentage under the unilateral trade liberalization due to unbiased tariff reduction against all trading partners. Hence, India is a net importer in agricultural and labour intensive manufacturing goods under the unilateral trade liberalization scenario. Further, it is noted that there is a decline in imports of services such as trade and construction, electricity and water and other services such as communication, business and financial services as a result of development in

the service sector due to a reduction in labour cost in those industries in the short-run.

The results on sectoral exports in Sri Lanka indicate that under the SAFTA, exports of metal products, oil seeds and vegetable oil will rise in the short-run whereas exports of other labour intensive manufacturing industries such as leather products, paper products and other manufacturing goods are also expected to rise under this policy option. The estimated results on imports in Sri Lanka indicate that there is a notable increase in import of paddy rice and processed rice under both policy options.

The sectoral exports of agricultural goods such as, oil seeds and vegetable oil, plant based fibres, sugar, and also labour intensive manufacturing goods such as textiles wearing apparel, leather products, paper products, electronic equipment and other manufacturing goods in Bangladesh and Rest of South Asia are expected to increase under both policy options. Isolating Bangladesh under the unilateral trade liberalization, it can be seen that import of agricultural goods increases significantly compared to the Rest of South Asia since Bangladesh has a larger population, which in turn causes higher demand for imported agricultural goods. Trade liberalization would also result in cheaper imports of such goods from their trading partners as high initial tariffs persist in these sectors in Bangladesh and the Rest of South Asia.

Tables A.6 and A.7 below illustrate the percentage change in exports and imports in all South Asian countries under different trade policy options in the long run. Under the SAFTA, there is an increase in exports of agriculture and labour intensive manufacturing industries in India, Pakistan, Sri Lanka and Bangladesh in the long run. It shows that exports of these commodities in Rest of South Asia rise considerably in the long run because of trading more with regional partners. Exports of labour intensive industries are increased due to inter–sectoral mobility of labour which moves labour from less to more efficient sectors whereas employment is determined exogenously in the long-run. Labour combined with more capital increases labour productivity, as capital stock is variable in the long-run. Furthermore, there is a noticeable increase in exports in capital intensive industries such as electronic equipment, machinery, equipment necessaries, and motor vehicles and parts in all South Asian countries underthe unilateral trade liberalisation in contrast to the SAFTA sceanrio. This is beacuse of reduction in cost of intermediate inputs .and also rental rate on capital in the long-run As in the

short run, imports of agricultural commodities increase substantially under unilateral trade liberalization in the long-run as a result of a greater reduction in prices of imports of such commodities.

The industry analysis in South Asian economies shows that exports and imports are dominated by a few agricultural products and labour-intensive manufacturing products, even though the region is commonly perceived to be a food deficit area given it has one-fifth of the world population (see Table 1 in Section 2). The South Asian economies trade most of their agricultural products among regional trading partners and India is the largest food exporter to the region. Hence, it is important for the South Asian economies to initiate steps to liberalize the agricultural sector to boost intra-regional trade.

Regarding the manufacturing sector, the ready-made garment industry is one of the most important industries for all South Asian countries. This sector contributes to more than 75 per cent of export earnings of Bangladesh and Pakistan, and more than 50 per cent of Sri Lanka's and nearly 30 per cent of India's export earnings (Das, 2007). Being largely endowed with labour resources, the region's exports are generally dominated by this sector for more than a decade. Under the quota regime from 1995-2005, these countries export readymade garments especially to USA and EU. Most of South Asian countries use imported intermediate inputs in manufacturing ready-made garments. Nonetheless, the results point out that the wearing apparel sectors in India, Sri Lanka and Pakistan continue to struggle under the SAFTA in the short run due to increased worldwide competition from larger suppliers such as China, and particularly since the expiration of the Multi Fibre Agreement in 2005. Yet, in Bangladesh and the Rest of South Asia, there is a rise in exports of wearing apparel because, being the least developed economies in the region, they still continue to enjoy tariff preferences in major markets (Adhikari and Weeratunge, 2006). The exports of the wearing apparel sector from all South Asian economies under the unilateral trade liberalization have significantly increased both in the short-run as well as in long-run as a consequence of a reduction in costs of imported inputs in manufacturing ready-made garments.

Additionally, under the both policy options, there is an increase in the exports of textiles from all South Asian countries in the short-run and the long-run. Hence, it is essential to improve trade facilitation services in the region to improve delivery times and custom clearance because textiles are

one of the most important intermediate inputs required for manufacturing garments. Developing the textile industry will help South Asian economies to emerge as more efficient and cost competitive suppliers within the region as well as in the global market.

The industry level projections indicate that, exports and imports increase significantly in all South Asian countries under unilateral trade liberalization than under the SAFTA both in the short-run and long-run. Thus, unilateral trade liberalization may be likely to expand the total trade in South Asia in the world market.

Impact on Welfare

Equivalent Variation (EV) is used to determine the overall level of welfare under each policy option. EV is an absolute monetary measure of welfare improvement in terms of income that results from the fall in import prices when tariffs are reduced or eliminated (Huff and Hertel, 2000).

Table 6 illustrates the overall level of welfare as an absolute value (in terms of US$) and as a percentage of total regional income (household income and government revenue). Although India gains significantly under both trade liberalization scenarios in absolute terms, it is clear that smaller economies (Bangladesh and Rest of South Asia) benefit more than the larger economies in the region under the same trade policy option in relative terms. Moreover, all South Asian countries gain substantially under the unilateral trade liberalization than under the SAFTA both in the short run and long run. It is also clear that Bangladesh and Rest of South Asia gain less in the long-run compared to the short-run under both policy options. This is consistent with the percentage change in real GDP in these countries as noted in Table 4 in Section 4.1. A number of empirical and quantitative studies have generated debate over the desirability of SAFTA, with differing viewpoints. Similar to the discussion in 4.1 the present study holds a moderate view of the SAFTA and is in agreement with the findings of Srinivansan and Canonero (1993). The findings reveal that SAFTA still ensures considerable benefits for small countries in the region, even though there are less potential gains from SAFTA than of unilateral trade liberalization. The results of the present study are also consistent with the studies undertaken by UNCTAD and ADB (2008) and RIS (2005) as these studies suggest that SAFTA would create some welfare gains for its member countries and smaller economies would gain more from the PTA than the larger economies in the region.

Hence, it can be recommended that implementation of the SAFTA as the preferred channel of promoting regional economic integration in South Asia. As Pitigala (2005) noted, it can be suggested to continue the process of unilateral trade liberalization in parallel with regional integration in South Asia. This process may help South Asian countries to diversify their narrow export bases and potentially evolve with new comparative advantages and complementarities which could facilitate the successful implementation of the SAFTA.

Table 6: Projected Equivalent Variations under Different Trade Policy Options

	SAFTA				Unilateral Trade Liberalisation			
	SR		LR		SR		LR	
Country/ Region	US$ Million	As a % of Total Regional Income	US$ Million	As a % of Total Regional Income	US$ Million	As a % of Total Regional Income	US$ Million	As a % of Total Regional Income
IND	1146.58	0.18	1344.94	0.21	14488.29	2.47	18675.71	2.91
PAK	226.94	0.24	302.79	0.32	1248.95	1.44	2856.99	3.02
LKA	152.44	0.76	247.89	1.23	199.67	1.12	472.44	2.35
BGD	344.99	0.62	241.72	0.43	2144.32	4.22	1970.68	3.52
XSA	386.16	2.78	261.35	1.88	621.93	4.88	474.18	3.41
USA	-95.66	0.00	-25.37	0.00	3772.45	0.04	1243.70	0.01
CAN	-5.87	0.00	-3.29	0.00	323.31	0.04	156.71	0.02
EU	-175.06	0.00	-43.71	0.00	4329.76	0.04	2843.85	0.02
ASE	-80.31	-0.01	-39.18	0.00	1482.52	0.22	1691.56	0.22

HIA	-74.30	-0.01	-36.70	0.00	337.51	0.03	669.61	0.06
JPN	-111.38	0.00	-28.49	0.00	1083.79	0.03	724.62	0.02
CHN	-108.98	-0.01	-60.86	0.00	219.81	0.01	484.82	0.03
XME	-75.72	-0.01	-33.67	0.00	1921.02	0.25	4091.31	0.48
AUS_NZL	-29.77	0.00	-11.21	0.00	539.76	0.08	512.58	0.07
RUS_XSU	-7.19	0.00	-6.52	0.00	237.85	0.04	241.76	0.04
ROW	-128.95	0.00	-21.14	0.00	1662.94	0.04	2085.14	0.05

Source: Simulation results derived from SAMGEM

Note: SR-Short-run effects LR-Long-run effects

Conclusion and Recommendation

The central concern of this study is to analyze the impact of trade liberalization in South Asia on key macroeconomic variables, trade and welfare of the South Asian economies. Two policy simulations were carried out using the SAMGEM: SAFTA zero tariff agreement, and unilateral trade liberalisation in South Asia. These simulations were run to determine the best trade policy option to maximize welfare of the member countries. The model was set up to capture the short-run and the long-run implications of different trade policy options considered for South Asia.

In probing the impact of trade liberalization on key macroeconomic variables in the short run, it was revealed that the highest gains in GDP and employment arise under the unilateral trade liberalisation than under the SAFTA. Tariff-cuts under the two trade reforms resulted in a reduction of domestic production costs and CPI; this in turn increased the competitiveness of domestic industries in local and international markets. Hence, it manifested the positive impacts on GDP and employment under both policy options. In the long run, there are higher gains in GDP under the both policy options in South Asian economies. The overall positive impact for the South Asian economies is the reflection of the reduction in input cost and increase in labor productivity in the long-run. Therefore, as Davis (1996) explicated, trade liberalization can contribute to economic growth in South Asian economies.

The industry analysis revealed that the exports of agricultural goods and labor-intensive manufacturing goods increase more rapidly in all South Asian economies. India is a net exporter of agricultural goods under the SAFTA. The expansion of exports in labour intensive manufacturing industries occurred due to a reduction in cost of inputs and nominal wages in the short run. Nevertheless, increase in exports in these industries are more pronounced in the long run than in the short run as these industries reap the benefits of reduction in the input cost combined with efficient utilization of capital and labour in expanding the output. Under unilateral trade liberalization, imports of agricultural and manufacturing goods in all South Asian economies increased more rapidly than exports due to non-discriminatory trade liberalization. Hence, all these economies are net importers under the

unilateral trade liberalization. For this reason, all South Asian economies experienced a negative trade balance under this policy option.

The development of industries will no doubt create more employment opportunities, thereby raising income levels of the citizens, which also helps to alleviate poverty in the region. The results demonstrate that the export and import of agricultural goods increase in all South Asian economies under the two policies, but net agricultural export remains negative, except in India under the SAFTA. Hence, there is a need to make effective use of the land and large labour endowments to increase productivity and exports of the agricultural sector in order to reduce poverty, as a significant proportion of the poor in the region depend on the agricultural sector. In 2009, the agricultural sector employed 55 per cent of the regional labour force but it only contributed 18 per cent of GDP (World Bank, 2010).

At present, the pattern of agricultural trade in the region focuses on a few traditional crops such as rice, wheat, cereals and grains. The results show increase in exports of vegetables, fruits, oil seed and vegetable oil, meat and fish, dairy products and other food products under both policy options. In developing countries, increase in urbanization and income growth is likely to increase demand for high value-added agricultural products (ready-to-eat food such as canned fruits, frozen vegetables etc.). South Asian economies can take advantage of this trend through diversification of the agricultural sector. As the World Bank has pointed out, the region also needs to improve and expand irrigation and water conservation systems to get good harvests, introduce modern farming technologies, improve investment climate, marketing infrastructure (improve rural roads to facilitate easy access to markets) and develop services to enhance market efficiency. Further, it is important to focus on building capacity to meet emerging challenges such as food safety and sanitary standards in these economies.

The manufacturing exports account for nearly 80 per cent of labour intensive items dominated by textile and wearing apparel, paper products, leather products, metal product in South Asian economies. The results indicate a greater potential for increasing exports of these products as a result of trade liberalization. The ready-made garment industry is one of the most important industries for all South Asian countries. However, these economies import textiles and other intermediate inputs from the East-Asian economies such as China, South Korea and Hong Kong in the process of manufacturing

wearing apparel. Therefore, it is important to focus on developing the textile industry to establish a complementary trade structure and thereby increasing intra-regional trade. South Asia has a natural advantage in producing textiles, yarn, fabric and cotton, which are most important raw materials for the industry (for instance India, Pakistan and Bangladesh have strong base for raw materials in producing textiles). Since the region has abundant cheap labour to work in this industry, it is advantageous for textile entrepreneurs to modernize their plants to be competitive with the other textile manufacturers in the world. Also, it is essential to train employees working in this industry to use new methods of knitting, sewing and weaving textiles.

In most of the South Asian economies, food products, metal products, plastic and rubber products are manufactured by Small and Medium scale Enterprises (SME). Hence, the governments need to provide some assistance to SMEs by introducing new methods to produce value-adding products, finding markets for their products and assisting them to obtain credit facilities at concessionary terms. The results under the three trade policies demonstrate that, in the long run, the relative cost of capital becomes lower compared to the cost of labour. Governments in South Asian economies therefore should encourage entrepreneurs who are engaged in the manufacturing sector to use more capital-intensive techniques to be cost competitive in the long run.

The findings also indicate that there exist possible opportunities to export electricity and gas by Rest of South Asia and Bangladesh respectively. South Asian region comprise 22 per cent of the world population and more than half of the population lives without the use of commercial energy (Dhungel, 2008). In fact, this is a serious impediment to accelerate economic activities in these economies (India, Pakistan, Bangladesh and Nepal) as there is a low level of per capita energy consumption. Therefore, regional co-operation in energy supply is essential to help such economies to increase their access to low cost energy. For instance, Bhutan is in a great position to export hydroelectricity to other South Asian countries through India. Similarly, Bangladesh is endowed with gas reserves which can be utilized to address the energy crisis in South Asia.

The results show that there is a greater prospect of expanding export of services such as communication and recreational services under the unilateral trade liberalization in all South Asian economies than under the SAFTA policy. The services sector is rapidly growing in South Asia and accounts for 49 per cent of the contribution to regional GDP in 2016 (see Table 2). South

Asian economies have a higher potential for developing tourism in the region, which in turn helps to enhance skills of the labour force and also generate employment opportunities. For instance, special tourism initiatives can be seen in India (diverse historical and cultural attractions, mountain ranges, beaches and wildlife), Sri Lanka (Buddhist heritage, beaches, and waterfalls), Bhutan (high value-added tourism) and Nepal (Buddhist heritage and majestic mountains)1 to promote tourism in these countries. Also, it is important to note that South Asian countries have a scope (India, Maldives, Nepal and mountain territories of Northern Pakistan) of promoting medical tourism and ecotourism, which have a greater potential to attract international tourists.

In addition, these economies should liberalize their financial markets, create conducive business environment and introduce methods to minimize transaction costs to encourage foreign participation in the ICT sector. This may also help to generate employment opportunities for various sections of the society from high-skilled to semi-skilled workers and also help industries to gain speedy access to the world market in trading their goods and services.

Welfare is predicted to be highest under the unilateral trade liberalization for all trading partners, followed by the SAFTA. Although SAFTA does not bring significant welfare gains for member countries, it could bring spillover benefits (improvement in infrastructure, benefits of economies of scale and new technology) which are beyond those declared in the agreement. Therefore, SAFTA is preferable as a pathway to coordinating liberalization in the region. As Pitigala (2005) noted, it is doable to continue the process of unilateral trade liberalization in parallel to regional integration in South Asia, which will help to improve both extra-regional and intra-regional trade in the economies in South Asia.

Therefore, it can be recommended that South Asian economies promote unilateral trade liberalization in each individual economy. Since South Asian economies trade more with other industrialized countries (EU and USA) in the world, unilateral trade liberalization may enhance the trade capacity in these economies. This will eventually enhance trade among regional trading partners and may help in boosting the intra-regional trade level. Being the largest economy in the region, India should initiate policies to accelerate regional economic co-operation in South Asia. The political conflicts

[1] Centre for Policy Dialogue (2010), http://www.cpd.org.bd/

between India and Pakistan should be resolved and these two economies should cooperate to make the SAFTA a success.

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Appendix

Table A.1: Regional Aggregation of the GTAP database

No	GTAP Code	Aggregated Region	Member Regions
1	IND	India	India (IND)
2	LKA	Sri Lanka	Sri Lanka (LKA)
3	PAK	Pakistan	Pakistan (PAK)
4	BGD	Bangladesh	Bangladesh (BGD)
5	XSA	Rest of South Asia	Bhutan, Maldives, Nepal andAfghanistan (XSA)
6	USA	United States of America	United States of America (USA)
7	CAN	Canada	Canada (CAN)
8	EU	European Union	Austria (AUT)Belgium , (BEL)Denmark , (DNK)Finland , (FIN)France , (FRA)Germany , (DEU)United Kingdom , (GBR)Greece , (GRC)Ireland , (IRL)Italy , (ITA)Luxembourg , (LUX)Netherlands , (NLD) ,Hungary (HUN), Portugal (PRT)Spain , (ESP)Sweden , (SWE), Cyprus(CYP), Czech Republic (CZE), Estonia(EST), Latvia (LVA), Lithuania (LTU), Malta (MLT), Poland (POL), Slovakia (SVK) and Slovenia (SVN).
9	ASE	ASEAN	Indonesia(IDN)Malaysia, (MYS)Philippines , (PHL)Singapore , (SGP) , Thailand (THA), Vietnam (VNM), Cambodia (KHM), Lao People's Democratic Republic (LAO), Myanmar (MMR), Rest of Southeast Asia (XSE).
10	HIA	High Income Asia	Hong Kong (HKG) Korea ,(KOR) and Taiwan (TWN)

11	JPN	Japan	Japan(JPN)
12	CHN	China	China (CHN)
13	XME	Rest of Middle East	,BahrainIran (IRN), Islamic Republic ofIraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates and Yemen
14	AUS_ NZL	Australia & New Zealand	Australia(AUS) and New Zealand (NZL)
15	RUS_ XSU	Russian Federation and Rest of Soviet Union	Russian Federation (RUS) and Rest of Former Soviet Union(XSU)
16	ROW	Rest of the World	Rest of Oceania(XOC) , Rest of East Asia (XEA), Mexico (MEX), Rest of North America (XNA), Argentina (ARG), Bolivia (BOL), Brazil (BRA), Chile (CHL), Colombia (COL), Ecuador (ECU), Paraguay (PRY), Peru (PER), Uruguay (URY), Venezuela (VEN), Rest of South America (XSM), Costa Rica (CRI), Guatemala (GTM), Nicaragua (NIC), Panama (PAN), Rest of Central America (XCA), Caribbean (XCB), Switzerland(CHE), Norway (NOR), Albania (ALB), Bulgaria (BGR), Rest of EFTA (XEF), Belarus (BLR), Croatia (HRV), Romania (ROU), Ukraine (UKR), Rest of Eastern Europe (XEE), Rest of Europe (XER), Kazakhstan (KAZ), Kyrgyzstan (KGZ), Armenia (ARM), Azerbaijan (AZE), Georgia (GEO), Turkey (TUR), Rest of Western Asia (XWE), Egypt (EGY), Morocco (MAR), Tunisia

			(TUN), Rest of North Africa (XNF), Nigeria (NGA), Senegal (SEN), Rest of Western Africa (XWF), Rest of Central Africa (XCF), Rest of South Central Africa (XAC), Ethiopia (ETH), Madagascar (MDG), Malawi (MWI), Mauritius (MUS), Mozambique (MOZ), Tanzania (TZA), Uganda (UGA), Zambia (ZMB), Zimbabwe (ZWE), Rest of Eastern Africa (XEC), Botswana (BWA), South Africa (ZAF) and Rest of South African Customs Union (XSC).

Source: The GTAP Version 7 Database (Purdue University: Centre for Global Trading Analysis, 2008)

Table A.2: Commodity Aggregation of the GTAP database

No.	GTAP Code	Aggregated Sector	Commodity/Service Category
1	PDR_ PCR	Rice; Paddy and Processed	Paddy rice (PDR)Processed rice , (PCR)
2	WHT_GRO	Wheat, Cereal Grains	Wheat (WHT), Cereal Grains nec (GRO)
3	V_F	Vegetables and fruits	Vegetables, fruit, nuts (V_F)
4	OSD_VOL	Oil seeds and vegetable oil	Oil seeds (OSD)Vegetable oils and fats , (VOL)
5	PFB_OCR	Plant based fibers and crops	Plant-based fibers (PFB)Crops nec , (OCR)
6	C_B_SGR	Sugar	Sugar cane (C_B)sugar beet , (SGR)
7	RMK_MIL	Dairy Products and milk	Dairy products(MIL)Raw milk , (RMK)
8	FSH	Fishing	Fishing (FSH)

9	CMT_OAP	Meat	Bovine mea (CMT)t, Meat products nec (OMT)Animal , products nec (OAP) ,Cattle, Sheep Goats, Horse (CTL)
10	OFD	Food Products nec	Food Products nec (OFD)
11	B_T	Beverages and tobacco products	Beverages and tobacco products (B_T)
12	TEX	Textiles	Textiles(TEX)
13	WAP	Wearing apparel	Wearing apparel (WAP)
14	LEA_LUM	Leather, wood products	Leather products (LEA)Wood products , (LUM)
15	PPP	Paper Products	Paper Products and Publishing (PPP)
16	CRP	Chemical, rubber, plastic products	Chemical, rubber, plastic products (CRP)
17	I_S_NFM_FMP	Metal Products	Basic metal products (FMP), Metals nec. (NFM), Ferrous metals (I_S)
18	ELE	Electronic Equipment	Electronic Equipment (ELE)
19	OME	Machinery	Machinery and Equipment nec. (OMF)
20	OMF	Other Manufacturing	Manufactures nec.(OMF)
21	MVH_OTP	Motor Vehicle & Transports	Motor vehicles and parts (MVH)Transport equipment nec , (OTN), Transport necessaries (OTP)
22	P_C_COA	Petroleum & Coal	Petroleum (P_C) & Coal Products (COA)
23	GAS_GDT	Gas	Gas (GAS), Gas Manufacturers & Distributors (GDT)
24	CMN_ROS	Tradeable Services	Construction (CNS)Financial services nec , (OFI)Insurance , (ISR)Business services nec , (OBS) ,Communication (CMN), Recreational and other services (ROS)
25	OSG_DWE	Non-Tradeable Services	Public Administration, Defense, Education, Health (OSG) and Dwellings (DWE)
26	WOL_ NMM	Other Primary products	Wool, Silk worm, cocoons (WOL), Minerals nec. (OMN), Mineral product necessaries

27	TRD_CNS	Trade & Construction	Trade (TRD) & Construction
28	ELY_WTR	Electricity, water and air transport	Electricity (ELY), Water (WTR), Water transport (WTP), and Air transport (ATP)
29	OIL	Oil	Oil (OIL)
30	FRS	Natural Resources and Extracts	Forestry(FRS)

Source: The GTAP Version 7 Database (Purdue University: Centre for Global Trading Analysis, 2008)

Table A.3: Factor Aggregation

No	GTAP Code	Description	Aggregated Factors
1	UnSkLab	Unskilled Labour	Unskilled Labour (UnSkLab)
2	SkLab	Skilled Labour	Skilled Labour (SkLab)
3	Capital	Capital	Capital (Capital), Land (Land), and Natural Resources (NatlRes)

Source: The GTAP Version 7 Database (Purdue University: Centre for Global Trading Analysis, 2008)

Table A.4: Projections of Percentage Change in Exports in Short-Run under Different Trade Policy Options

	SAFTA					Unilateral Trade Liberalisation				
	IND	**PAK**	**LKA**	**BGD**	**XSA**	**IND**	**PAK**	**LKA**	**BGD**	**XSA**
1 pdr_pcr	11.7	1.5	-1.5	3.4	1.2	22.9	9.5	7.8	13.6	20.2
2 wht_gro	1.9	9.4	-0.9	116.3	7.3	16.1	19.5	12.3	61.5	5.1
3 v_f	5.2	18.3	20.5	5.5	68.1	11.1	13.9	17.1	8.9	44.4
4 osd_vol	2.6	-0.2	117.3	120.2	100.4	14.1	4.2	5.9	117.6	20.5
5 pfb_ocr	6.1	4.4	6.3	27.3	44.2	17.3	18.2	14.8	20.3	34.3
6 c_b_sgr	25.2	11.4	1.6	4.9	15.8	21.2	-6.2	-6.3	22.5	34.1
7 rmk_mil	24.2	35.4	23.1	33.8	9.3	32.4	31.5	17.9	47.3	-1.7
8 fsh	0.2	-0.5	-0.5	1.1	-0.1	4.9	5.4	2.7	4.2	5.9
9 cmt_oap	-1.5	5.7	39.8	10.3	9.3	14.6	19.6	23.9	29.2	30.7
10 ofd	-0.1	8.7	1.0	3.1	17.1	10.1	13.6	15.6	13.9	19.1
11 b_t	7.6	-2.5	3.1	3.6	57.5	13.4	-1.0	3.7	6.9	10.9
12 tex	1.3	2.6	6.6	7.6	12.5	26.6	27.0	12.7	38.6	19.2
13 wap	-1.1	-1.3	-1.2	9.4	12.5	25.3	24.7	8.3	57.1	43.1
14 lea_lum	-1.5	1.1	25.2	6.0	23.8	22.9	22.9	37.2	35.8	57.7
15 ppp	11.1	5.4	33.4	6.2	10.4	25.6	26.4	45.2	32.1	28.4
16 crp	2.4	6.4	10.1	20.4	34.6	32.9	21.7	24.2	27.8	14.4
17 i_s_nfm_fmp	1.4	0.3	87.1	31.7	49.2	36.2	23.5	54.2	49.9	18.1
18 ele	1.8	-0.6	7.5	6.0	10.4	45.8	43.4	36.6	32.6	58.7
19 ome	2.1	9.4	27.4	14.1	11.1	45.1	49.1	42.7	32.1	21.2
20 omf	-1.2	1.1	4.5	8.1	20.1	32.2	27.3	34.0	32.1	46.5
21 mvh_otn_otp	3.6	-0.1	0.5	4.6	6.6	24.9	32.8	12.3	27.5	39.4
22 p_c_coa	7.7	-2.2	1.9	29.6	2.8	31.0	-7.5	7.7	78.4	9.8
23 gas_gdt	7.0	-7.3	-19.9	13.5	5.7	76.6	134.5	39.9	78.8	135.9

24 cmn_ros	-1.2	-1.3	-0.4	2.8	2.8	10.5	6.9	8.5	16.1	19.0
25 osg_dwe	-1.2	-0.9	0.7	1.8	0.5	10.2	12.8	11.5	8.2	13.6
26 wol_omn_nmm	0.3	7.8	3.6	2.9	5.9	13.3	13.6	6.5	13.5	8.1
27 trd_cns	-1.2	-0.8	-1.3	2.3	2.5	11.9	13.9	6.5	12.6	17.1
28 ely_wtr	-0.4	-0.8	-0.4	2.2	2.4	7.6	12.9	6.3	15.1	17.9
29 oil	-2.2	-3.5	41.1	6.7	-17.3	21.9	26.2	47.7	47.3	-6.5
30 frs	4.1	-0.2	37.3	58.1	35.9	15.0	6.8	39.6	51.9	38.5

Source: Simulation results derived from SAMGEM

Table A.5: Projections of Percentage Change in Imports in Short-Run under Different Trade Policy Options

	SAFTA					Unilateral Trade Liberalisation				
	IND	**PAK**	**LKA**	**BGD**	**XSA**	**IND**	**PAK**	**LKA**	**BGD**	**XSA**
1 pdr_pcr	1.6	21.5	73.0	56.7	0.1	62.9	24.5	77.8	61.3	-0.1
2 wht_gro	1.1	0.9	3.6	3.5	3.3	24.0	33.5	9.6	10.6	-4.5
3 v_f	4.3	3.8	17.4	11.7	2.0	41.8	15.4	27.4	20.3	2.2
4 osd_vol	2.7	2.2	7.4	4.0	4.4	99.3	35.0	20.6	28.9	2.7
5 pfb_ocr	8.3	4.5	18.3	4.5	5.4	51.4	23.1	58.0	14.8	9.0
6 c_b_sgr	7.9	2.8	0.7	0.1	0.0	103.1	46.3	8.0	42.9	-1.5
7 rmk_mil	1.6	2.3	1.0	14.7	5.3	82.3	58.9	13.8	67.6	9.9
8 fsh	2.1	1.1	2.0	22.3	1.9	18.2	10.0	8.2	26.2	3.4
9 cmt_oap	1.6	1.1	0.4	-0.7	3.3	20.9	16.3	29.0	24.4	8.6
10 ofd	4.5	4.4	1.4	4.6	3.6	51.1	58.4	7.2	25.6	6.4
11 b_t	4.0	0.7	1.7	6.1	-2.9	71.6	43.9	32.2	51.9	-2.7
12 tex	2.6	1.9	-0.1	10.7	6.6	43.0	50.7	6.4	67.2	15.6
13 wap	5.0	1.0	6.1	16.8	-0.2	65.5	59.2	19.9	60.0	-2.2
14 lea_lum	2.9	2.2	4.6	3.2	4.8	35.8	38.2	11.8	42.3	11.8
15 ppp	1.9	0.9	4.8	4.0	7.2	34.4	20.8	9.4	33.0	14.6
16 crp	1.2	2.0	1.8	3.8	6.6	22.6	20.1	6.0	23.5	10.3
17 i_s_nfm_fmp	0.9	1.0	13.7	4.2	11.1	23.0	9.4	13.8	20.7	19.0
18 ele	1.0	0.6	1.7	3.8	5.9	4.3	19.6	1.8	28.5	11.9
19 ome	0.7	1.0	1.5	1.3	6.7	15.9	9.0	0.7	9.7	14.2
20 omf	0.8	2.0	3.8	5.0	8.0	26.6	40.0	14.9	66.7	24.8
21 mvh_otn_otp	0.7	0.2	3.5	0.9	6.2	13.8	0.1	7.6	12.6	17.0
22 p_c_coa	0.8	1.0	24.3	5.4	2.2	20.7	17.5	56.8	31.8	4.1
23 gas_gdt	4.9	2.2	5.6	-4.5	18.4	75.4	-44.6	-6.9	-27.8	-16.7
24 cmn_ros	0.5	0.6	0.3	-0.7	0.5	-1.4	-1.7	-2.7	-4.4	-1.3

25 osg_dwe	0.3	0.6	-0.2	-0.4	-0.9	1.0	-5.5	-4.9	-1.7	-7.6
26 wol_omn_nmm	0.5	1.3	4.9	4.2	14.3	11.2	20.8	7.4	31.3	18.2
27 trd_cns	0.7	0.6	0.6	0.1	0.5	-5.0	-5.6	-3.2	-0.9	-2.4
28 ely_wtr	0.6	0.5	0.3	-1.2	1.1	-3.5	-4.6	-2.5	-8.6	-2.5
29 oil	1.2	0.1	0.7	1.9	7.4	12.1	-5.0	1.7	15.4	-0.4
30 frs	1.7	18.0	17.4	0.7	4.6	13.2	36.5	21.5	0.2	6.0

Source: Simulation results derived from SAMGEM

Table A.6: Projections of Percentage Change in Exports in Long-Run under Different Trade Policy Options

	SAFTA					**Unilateral Trade Liberalisation**				
	IND	**PAK**	**LKA**	**BGD**	**XSA**	**IND**	**PAK**	**LKA**	**BGD**	**XSA**
1 pdr_pcr	11.5	1.6	0.6	3.5	4.7	15.4	9.7	11.3	16.3	28.3
2 wht_gro	2.1	9.3	1.0	116.0	8.3	12.2	15.9	14.3	61.8	7.7
3 v_f	5.2	18.1	21.6	5.4	68.9	8.3	11.5	18.5	8.6	47.3
4 osd_vol	2.6	-0.6	120.4	119.9	102.6	9.3	0.2	14.7	119.4	26.5
5 pfb_ocr	6.0	4.1	8.1	27.0	45.2	11.6	13.4	16.5	19.7	36.2
6 c_b_sgr	25.3	11.4	3.2	3.5	14.1	17.3	-7.9	-3.2	13.5	29.7
7 rmk_mil	24.0	34.4	26.2	32.6	11.1	23.9	25.1	24.3	42.6	3.4
8 fsh	0.2	-0.4	1.3	1.4	2.8	4.0	5.7	6.0	7.3	11.9
9 cmt_oap	-1.7	5.5	43.8	10.0	11.4	8.0	13.4	31.1	28.3	34.7
10 ofd	-0.2	8.5	3.0	3.3	19.9	4.6	10.9	19.1	15.3	25.7
11 b_t	7.6	-2.6	5.2	3.7	59.2	11.3	-2.7	7.8	7.6	20.2
12 tex	0.9	2.7	9.2	6.0	11.3	13.4	24.6	17.2	29.0	17.6
13 wap	-1.7	-1.2	0.7	8.2	12.3	9.3	22.9	11.4	50.0	42.9
14 lea_lum	-1.9	1.0	27.5	4.3	23.1	10.7	18.1	41.6	25.0	57.9
15 ppp	11.0	5.0	33.7	5.4	11.0	20.0	18.4	46.1	27.1	31.3

16 crp	2.5	5.7	12.7	20.1	36.8	31.4	9.1	28.7	26.7	19.2
17 i_s_nfm_fmp	1.5	-0.6	88.1	30.1	49.2	33.7	13.7	57.0	39.9	19.5
18 ele	1.8	-0.7	8.8	6.0	14.2	41.3	38.5	38.6	32.9	66.4
19 ome	2.2	9.1	28.1	13.6	14.9	42.9	43.6	43.4	30.4	30.6
20 omf	-1.4	0.8	5.7	7.0	21.5	25.3	21.0	35.5	25.9	49.7
21 mvh_otn_otp	3.4	-0.1	2.1	1.8	2.2	16.2	30.4	13.6	9.0	27.9
22 p_c_coa	8.8	-2.4	2.6	31.9	5.8	33.7	-7.6	8.7	83.2	15.8
23 gas_gdt	8.4	-18.0	6.5	14.8	2.4	77.6	-39.4	86.5	89.7	118.2
24 cmn_ros	-1.3	-0.9	-1.9	0.6	-0.4	6.7	8.5	2.2	2.0	10.3
25 osg_dwe	-1.5	-1.5	-3.4	1.5	1.8	1.7	0.8	-1.9	7.7	15.5
26 wol_omn_nmm	0.3	7.4	5.6	3.0	9.0	11.4	14.2	9.7	14.1	15.5
27 trd_cns	-1.3	-1.5	-0.5	1.7	3.1	6.6	2.4	6.4	9.0	17.8
28 ely_wtr	-0.4	-0.8	0.8	1.2	2.7	6.3	10.1	8.3	9.3	18.1
29 oil	-1.2	-2.1	41.6	5.0	12.5	22.4	37.6	46.9	36.0	60.0
30 frs	3.8	0.3	38.3	58.4	42.8	7.5	11.4	40.5	56.5	55.9

Source: Simulation results derived from SAMGEM

Table A.7: Projections of Percentage Change in Imports in Long-Run under Different Trade Policy Options

	SAFTA					**Unilateral Trade Liberalisation**				
	IND	**PAK**	**LKA**	**BGD**	**XSA**	**IND**	**PAK**	**LKA**	**BGD**	**XSA**
1 pdr_pcr	1.9	21.4	71.9	56.5	0.0	70.6	23.2	73.4	55.4	-0.5
2 wht_gro	1.2	1.0	6.4	3.5	3.2	27.0	36.2	16.5	11.0	-4.2
3 v_f	4.3	3.9	16.9	11.8	1.8	43.8	17.8	26.6	20.4	1.9
4 osd_vol	2.8	2.6	9.2	3.7	4.0	102.5	42.2	25.6	30.4	1.8
5 pfb_ocr	8.4	4.6	18.2	3.4	5.1	53.1	24.4	57.9	8.4	8.4
6 c_b_sgr	8.0	2.8	1.4	0.6	0.1	106.7	49.1	9.3	47.3	-1.3

7 rmk_mil	1.8	2.4	0.4	14.7	4.0	88.9	62.7	13.3	70.4	8.0
8 fsh	2.3	1.3	1.1	22.3	1.4	22.0	13.6	6.5	25.2	2.6
9 cmt_oap	1.7	1.3	-0.9	-0.7	2.8	25.0	19.8	27.1	24.8	7.8
10 ofd	4.7	5.8	1.3	4.4	3.0	54.9	84.6	7.1	24.5	5.3
11 b_t	4.4	0.8	0.9	5.7	-3.0	79.1	46.4	30.8	53.9	-2.8
12 tex	2.8	1.9	1.5	10.4	6.7	50.0	51.7	8.9	65.5	15.8
13 wap	5.8	1.0	5.7	17.0	-0.3	84.8	61.6	18.6	61.4	-2.2
14 lea_lum	3.2	2.4	5.9	3.6	2.9	43.3	44.2	14.9	46.7	9.6
15 ppp	2.2	1.1	5.6	3.9	6.3	41.8	24.6	11.7	33.6	13.2
16 crp	1.2	2.5	2.8	3.4	5.9	23.7	28.6	8.6	23.1	9.1
17 i_s_nfm_fmp	1.0	1.5	15.2	4.8	7.8	25.6	19.3	18.4	26.2	14.9
18 ele	1.3	1.1	3.7	3.2	2.6	13.8	31.6	9.3	29.5	7.8
19 ome	0.8	1.8	3.4	1.1	3.8	21.1	26.0	8.2	10.9	10.6
20 omf	1.0	2.8	6.1	5.2	6.5	32.0	56.0	21.3	70.1	22.7
21 mvh_otn_otp	0.9	0.4	4.5	1.8	3.2	22.1	7.4	12.0	19.9	13.5
22 p_c_coa	0.8	1.1	36.2	5.0	1.5	21.8	19.8	88.9	33.5	3.2
23 gas_gdt	4.6	5.8	-0.5	-5.1	18.4	77.0	13.7	-17.5	-31.3	-13.2
24 cmn_ros	0.6	0.5	0.9	0.1	0.9	1.6	-1.6	-0.1	1.8	0.3
25 osg_dwe	0.4	0.9	1.6	-0.3	-1.3	3.5	2.2	1.2	-0.7	-8.0
26 wol_omn_nmm	0.6	1.3	5.8	4.1	11.7	14.1	23.6	9.7	32.4	14.5
27 trd_cns	0.8	1.1	0.4	0.1	1.0	0.9	2.0	-2.7	-0.6	0.3
28 ely_wtr	0.7	0.5	-0.2	-0.6	1.0	-1.3	-2.4	-3.1	-4.7	-2.0
29 oil	1.3	0.0	1.7	1.3	-6.6	13.3	-4.2	3.8	15.9	-31.2
30 frs	1.9	18.5	18.7	0.3	2.3	19.0	39.0	23.8	-2.4	1.4

Source: Simulation results derived from SAMG