Effects of Trade Liberalisation in South Asia with Special Reference to Sri Lanka*

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Abstract

This paper provides a quantitative assessment of likely implications of bilateral trade liberalisation between Sri Lanka and South Asian Association for Regional Cooperation (SAARC) countries. We perform simulations using the Global Trade Analysis Project (GTAP) model to quantify the impact of liberalised trade. GTAP model is a computable general equilibrium (CGE) model of the world economy. Using the model simulations, the paper also examines the implications of extending such trading arrangements to countries outside the SAARC membership. In particular, we look at the effects of possible bilateral tariff reductions between Sri Lanka and ASEAN-4 (Thailand, Indonesia, Philippines and Malaysia) and other Asian countries. Results indicate that Sri Lanka may experience some welfare gains from bilateral trade liberalisation with Asian trading partners. While our exercise is illustrative, it nevertheless reveals useful implications for Sri Lanka and for other countries of regional trade policy reforms.

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I Introduction

Since 1977 Sri Lanka has undertaken a series of economic reforms to transform the economy from one based on primary goods producing inward looking oriented to one driven by manufactured goods producing outward looking economy. International trade has been recognised as an important component of economic growth and hence in the reform process. Consequently, Sri Lanka has been actively seeking access to international markets for its newly developed manufactured products and shifted the market orientation from United Kingdom to more toward North American and Middle East markets. At the same time, it has expanded its Asian market and participated in regional cooperation forums such as Bangkok Agreement, Asian Clearing Union (ACU), and South Asian Association for Regional Cooperation (SAARC). The latter was formed in 1985 with representative countries of Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. In 1993, South Asian Preferential Trading Arrangement (SAPTA) was established under the umbrella of SAARC (Mukherji, 1998). In comparison to other SAARC members, Sri Lanka has implemented a series of unilateral tariff reductions and has significantly reduced many non-tariff barriers (see Athukorala and Kelegama, 1998; Bandara and McGillivray, 1998; Panagariya, 1999).

Though SAARC was in existence for well over a decade, progress toward trade reforms and regional cooperation between member countries have been slow. In December 1998, a progress has been made after signing the free trade agreement between India and Sri Lanka (Central Bank of Sri Lanka, 1999). The objective of the agreement is to create a bilateral free trade area between the two countries. Many would regard this as a positive step in establishing free trade among SAARC members by extending such arrangements to other member nations. Such a bilateral trade pact provides a building block for accelerated regional trade liberalisation in the South Asian (SA) region. As India has become an important trading partner for Sri Lanka in recent years, especially for its imports, it is likely that this free trade deal will have far-reaching implications for the Sri Lankan economy. Although it is anticipated that participating countries would gain from more liberalised trade by accelerating economic growth, there has been little research undertaken in regard to regional trading arrangements and their impact on participating countries in the SAARC region. Some important issues relevant to south Asian regional trading arrangements have been addressed in certain ways by Sirinivasan (1994; 1998), DeRosa and Govindan (1997), and Rajapakse and Arunatilleke (1997).

This paper aims to provide a quantitative assessment of likely implications of bilateral trade liberalisation between Sri Lanka and SAARC countries in a broad framework. We perform simulations using the Global Trade Analysis Project (GTAP) model to quantify the impact of liberalised trade. GTAP model is a computable general equilibrium (CGE) model of the world economy. Using the model simulations, the paper also examines the implications of extending such trading arrangements to countries outside the SAARC membership. In particular, we look at the effects of possible bilateral tariff reductions between Sri Lanka and ASEAN-4 (Thailand, Indonesia, Philippines and Malaysia) and other Asian countries (OAC). While our exercise is illustrative, it

nevertheless reveals useful implications for Sri Lanka and other countries of regional trade policy reforms.

The paper is organised as follows. Section II covers the pattern of external trade of Sri Lanka with special reference to the direction of foreign trade. An overview of the GTAP model is provided in Section III. Section IV describes the bilateral trade liberalisation scenarios that have been simulated using GTAP. Simulation results are presented and discussed in Section V. Section VI concludes.

II Pattern of External Trade and Tariffs

Since independence, Sri Lanka experienced a rapid decline in trade dependence as consequences of deteriorating terms of trade for its tree crop exports and the fruitless import substitution industrialisation attempt of the 1960s and early 1970s (Rajapakse, 1996). By mid 1970s, external trade (both imports and exports) accounted for 37 per cent of GDP. The liberalisation and outward oriented economic policies that began in 1977 pushed the country's trade dependence to record high levels. By 1995, Sri Lanka registered a trade dependency ratio of 69 per cent of GDP. Despite the increased dependence on foreign trade, Sri Lanka is still a minor participant in the global trade, with total exports and imports accounting for only 0.08 per cent and 0.1 per cent of world exports and imports, respectively, in 1994. Over the last two decades, the composition of exports changed from agricultural to manufacturing, with the share of agriculture in total exports shrinking from 62 per cent in 1980 to 22 per cent in 1998. During the same period, the contribution of manufacturing to total exports increased from 33 per cent to 75 per cent. Much of this increase is in manufactured exports represented by textile and garments.

Table 1 reports the direction of exports from 1987 to 1997. The growth of markets in industrialised countries (ICs) for Sri Lanka's exports is striking. The share of exports to ICs has increased from 59 per cent in 1987 to 73 per cent in 1997. The United States and Japan are the main buyers in this group. As can be seen from the table, the share of exports accounted for by SAARC countries has experienced a mild decline over the period under consideration, despite the fact that exports to this region more than doubled in dollar terms between 1987 and 1997. Overall, the importance of Asia as a destination of exports seemed to have been some what stable around 9 to 10 per cent of total exports during the decade.

As can be observed from Table 2, unlike exports imports have been occupying a growing significance for Sri Lanka as far as SAARC countries are concerned. Asia as a whole accounted for 37 per cent of imports in 1987. This share jumped to a 49 per cent by 1997 as Sri Lanka gradually turned away from imports coming from ICs. In recent years, India, Pakistan and ASEAN-4 have become important sources of imports. Figure 1 highlights the trends in Sri Lanka's trade balance between 1987 and 1997 with respect to the broad classification of trading partners reported in Tables 1 and 2. While there is a growing and significant trade surplus with ICs, Sri Lanka has recorded trade deficits with SAARC and rest of Asia. As trade becomes more liberalised, this trend is set to continue unless there are vast improvements in exports to the Asian continent.

Table 1: Direction of Exports from Sri Lanka (US $ million)

Year	SAARC	ASEAN-4	OAC	ICs	ROW	Total
1987	53	12	77	783	409	1334
	(0.04)	(0.00)	(0.06)	(0.59)	(0.31)	
1988	92	26	87	858	398	1461
	(0.06)	(0.02)	(0.06)	(0.59)	(0.27)	
1989	69	33	67	955	407	1540
	(0.04)	(0.02)	(0.04)	(0.62)	(0.26)	
1990	69	33	81	1166	546	1895
	(0.04)	(0.02)	(0.04)	(0.61)	(0.29)	
1991	61	30	123	1301	472	1987
	(0.03)	(0.02)	(0.06)	(0.65)	(0.24)	
1992	58	25	99	1904	402	2488
	(0.02)	(0.01)	(0.04)	(0.77)	(0.16)	
1993	71	35	118	2156	478	2858
	(0.02)	(0.01)	(0.04)	(0.76)	(0.17)	
1994	86	49	168	2410	497	3210
	(0.03	(0.02)	(0.05)	(0.75)	(0.15)	
1995	101	67	184	2876	582	3810
	(0.03)	(0.02)	(0.05)	(0.75)	(0.15)	
1996	109	56	187	3011	734	4097
	(0.03)	(0.01)	(0.05)	(0.73)	(0.18)	
1997	120	75	194	3421	842	4652
	(0.03)	(0.02)	(0.04)	(0.73)	(0.18)	

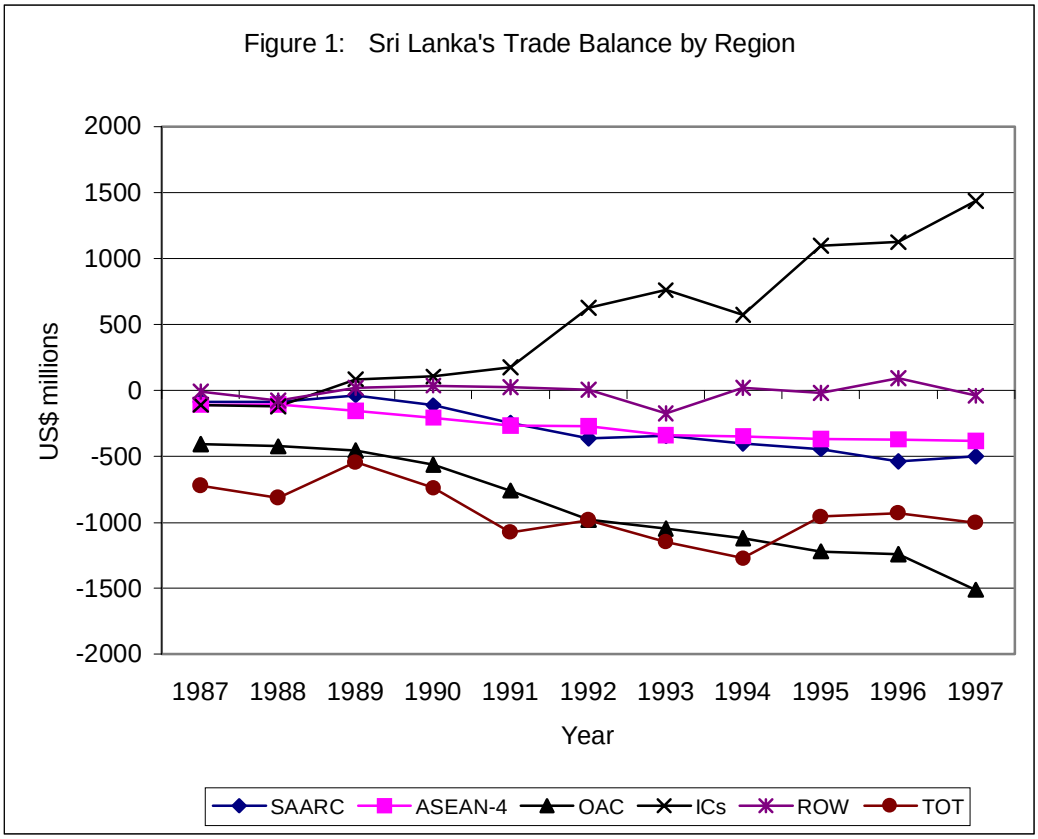
Source: IMF, *Direction of Trade Statistics Yearbook* (various issues).
Note: Numbers in parentheses are trade shares which will add up to 1 across each row.

Initial tariff barriers are important determinants of potential effects of trade liberalisation in relation to particular sectors and regions. Calculated from the GTAP version-4 database, Table 3 shows the ad valorem tariff rates applicable to food and non-food manufactures in 1995 by regional grouping of Asia considered in this paper. From the tariff rates reported in the table, it is clear that SAARC countries, except Sri Lanka, still maintain relatively high tariff barriers against manufacturing imports from Asian neighbours, though the rate is somewhat lower for manufactured food imports from Sri Lanka. It appears that Sri Lanka is by far the most liberalised economy among SAARC nations in terms of tariff rates applicable to manufactures. It also does not appear to discriminate against imports from Asia. In general, OAC group has the lowest tariff barriers against imports of manufactured products.

Table 2: Sources of Imports to Sri Lanka (US$ million)

Year	SAARC	ASEAN-4	OAC	ICs	ROW	Total
1987	139 (0.07)	123 (0.06)	484 (0.24)	892 (0.43)	418 (0.20)	2056
1988	182 (0.08)	133 (0.06)	512 (0.22)	979 (0.43)	473 (0.21)	2279
1989	125 (0.06)	179 (0.09)	524 (0.25	871 (0.42)	388 (0.18)	2087
1990	184 (0.07)	241 (0.09)	641 (0.25)	1059 (0.40)	511 (0.19)	2636
1991	308 (0.10)	297 (0.10)	882 (0.29)	1128 (0.37)	446 (0.14)	3061
1992	422 (0.12)	297 (0.09)	1079 (0.31)	1277 (0.37)	398 (0.11)	3473
1993	416 (0.11)	373 (0.09)	1165 (0.29)	1398 (0.35)	653 (0.16)	4005
1994	489 (0.11)	395 (0.09)	1287 (0.29)	1835 (0.41)	476 (0.10)	4482
1995	545 (0.11)	433 (0.09)	1403 (0.30)	1782 (0.37)	604 (0.13)	4767
1996	647 (0.13)	426 (0.08)	1429 (0.29)	1886 (0.38)	640 (0.13)	5028
1997	620 (0.11)	459 (0.08)	1706 (0.30)	1988 (0.35)	881 (0.16)	5654

Source: IMF, *Direction of Trade Statistics Yearbook* (various issues).
Note: Numbers in parentheses are trade shares which will add up to 1 across each row.



Source: IMF, *Direction of Trade Statistics Yearbook* (various issues).

Table 3: Tariffs on Manufactures by Commodity, Source and Destination, 1995 (%)

Exporting region	Importing Region			
	Sri Lanka	SAARC*	ASEAN-4	OAC
Manufactures-food				
Sri Lanka	-	33.1	16.9	4.9
SARRC countries	19.4	-	18.2	18.0
ASEAN-4	16.3	36.5	-	12.4
Other Asian countries	27.8	43.1	25.9	-
Manufactures-non food				
Sri Lanka	-	40.1	12.3	5.7
SARRC countries	14.2	-	9.2	6.7
ASEAN-4	16.9	41.1	-	4.0
Other Asian countries	18.8	40.2	10.8	-

Note: * Excluding Sri Lanka. Source: GTAP Version 4 Database (McDougall et al., 1998).

III Overview of the GTAP Model

The analytical framework used to quantify the impact of bilateral tariff reductions is the well-known GTAP model (Hertel, 1996). It is a comparative-static multi-regional CGE model of the Johansen type that is being used by more than hundred researchers around the world. The modelling of each region in GTAP is based on the ORANI model (Dixon et al., 1982). We use the latest version of GTAP together with version four of the database which distinguishes 45 regions and 50 sectors in each region.

The model has many general features which include product differentiation by country of origin, explicit recognition of savings by regional economies, a capital goods producing sector in each region to service investment, international mobility of capital, multiple trading regions, multiple goods and primary factors, empirically based differences in production technology and consumer preferences across regions, and explicit recognition of a global transport sector. It is also featured by many policy variables, including taxes and subsidies on commodities as well as on primary factors, making the model more attractive to policy analysts.

In each region both factor and commodity markets are assumed to be perfectly competitive. Producers operate with constant returns to scale production functions where the technology is described by Leontief and CES functions. Two broad categories of inputs to production are identified, namely intermediate inputs and primary factors. Each regional sector is assumed to choose a mixture of inputs to minimise total cost for a given level of output. At the first level, producers use composite units of intermediate inputs and primary factors in fixed proportions according to a Leontief function. At the second level of the production nest, intermediate input composites are obtained as combinations of imported bundles and domestic goods of the same input-output class, and primary factor input composites are created as combinations of skilled-labour, unskilled-labour, capital, land, and natural resources. A CES function is used in forming both types of composites. Finally at the third level, imported bundles are created via a CES aggregation of imported goods of the same class from each region.

On the demand side, the GTAP model adopts a sophisticated specification of consumer behaviour which allows for differences in both price and income responsiveness of demand in different regions, depending on the level of development and regional specific demand patterns. Each region has a single representative household. This regional household receives all the income generated through payments to primary factors, and net tax revenue. Its behaviour is governed by an aggregate utility function over private household consumption, government consumption, and savings. The aggregate utility is modelled by a Cobb-Douglas function with constant expenditure shares. The government consumption is also described by a Cobb-Douglas function over composite commodities where the demand for the latter is a CES aggregation of imports and domestic goods. Private household consumption is explained by a CDE (Constant Difference of Elasticities) expenditure function. These households purchase bundles of commodities where the bundles are CES aggregation of domestic goods and imported bundles. The imported bundles in turn are formed by a CES aggregation of imports from different regions.

Capital creation takes place in each region according to a technology which is similar to producing current goods except that it requires only domestic and imported intermediate inputs. This capital creation services the investment which is financed by a global pool of savings. Each region contributes a share of its income to a savings pool at a global bank. This bank is designed to mediate world savings and investment. There are two methods available in the standard GTAP model for allocating global savings to investment in each region. The first method allocates global savings across investment in a fixed proportion of the total savings so that the regional composition of global investment remains unaltered. The second method allows investment to take place in each region according to the relative rates of return.

As noted before, the version four of GTAP database divides the world into 45 countries and distinguishes 50 sectors (commodities). Given the focus of our study, we aggregate the database into 5 regions and 9 sectors as shown in the Appendix Table A1. As our focus is on the bilateral tariff reductions between Sri Lanka and SAARC countries, and other Asian trading partners, the regional aggregation adopted highlights the importance of those trading partners for Sri Lanka. In particular, the manufacturing sectors are aggregated into two sectors, namely manufacturing-food (MF) and manufacturing non-food (MNF). They are the main exporters from Sri Lanka at present.

IV Experimental Design with GTAP

A series of simulation experiments conducted with the standard version of the GTAP model are outlined in this section. The regions that are critically important for the analysis here are Sri Lanka, SAARC, ASEAN-4, and OAC. The bilateral tariff reduction experiments are confined to trade of manufactures, which are disaggregated into food and non-food categories. Given the importance of the agricultural sector, the inclusion of food imports into the liberalisation agenda has sparked an important debate in many small developing countries such as Sri Lanka. Therefore, this paper attempts to distinguish the impact on the agricultural sector of the liberalisation process by estimating the effects of tariff cuts on bilateral basis. The simulations with the GTAP model involved both partial and complete trade liberalisation. Table 4 outlines the details of the tariff experiments conducted with the model for the analysis reported in the paper.

The tariff simulations were conducted within the short-run framework. The overall capital stock in each of the five regions remains unaffected during the bilateral tariff reductions. On the other hand, the workforce in each economy is endogenous while the wage rate is exogenous. The industries can alter the level of output in response to tariff cuts by changing the amount of labour employed at the going real wage with a fixed capital stock. This means demand for labour either increase or decrease depending on the change in industry activity level, the ease of factor substitution, and change in the relative factor price ratio. This factor market scenario seems appropriate for many Asian economies. Investment takes place in each economy during the tariff reductions but the time frame is not long enough to alter the industry capital stocks.

Table 4: Experimental Design of Tariff Cuts in GTAP

Experiment	Level of bilateral ad valorem tariff cuts between Sri Lanka and					
	SAARC		ASEAN-4		OAC	
	On non –food manufactures	On both food and non-food manufactures	On non –food manufactures	On both food and non-food manufactures	On non –food manufactures	On both food and non-food manufactures
Experiment 1	50%					
Experiment 2	100%					
Experiment 3		50%				
Experiment 4		100%				
Experiment 5			50%			
Experiment 6			100%			
Experiment 7				50%		
Experiment 8				100%		
Experiment 9					50%	
Experiment 10					100%	
Experiment 11						50%
Experiment 12						100%

V Results

The trade liberalisation scenarios examined in this paper are concerned with the establishment of partial and full free trade areas on bilateral basis. Thus such trade liberalisation options fall into preferential free trade arrangements between two contracting nations. As large trade diversion occurs with such arrangements, there can be efficiency losses which may lead to reduced welfare (De Melo, Panagaria and Rodrik, 1992)[1].

This section reports the effects of bilateral trade linberalisation on selected macroeconomic variables, structural adjustments through sectoral output changes, and employment levels. In order to distinguish the outcome of incorporating tariff reductions on imports of MF, results are presented separately for the liberalisation of imports of MNF and then all manufactures.

Implications for Sri Lanka:

The first panel of Table 5 presents the macroeconomic and welfare impact on Sri Lanka of bilateral tariff reduction arrangements on MNF. The table reports effects of two levels

[1] See Krueger (1999) for a more recent review of welafare implications of preferential trading arrangements.

Table 5: Macroeconomic Effects of Bilateral Tariff Reductions on Non-food Manufactures

Region	SAARC		ASEAN-4		OAC	
	50% removal of ad valorem import tariffs	Complete removal of ad valorem import tariffs	50% removal of ad valorem import tariffs	Complete removal of ad valorem import tariffs	50% removal of ad valorem import tariffs	Complete removal of ad valorem import tariffs
Sri Lanka:						
Change in real GDP	0.5	1.7	0.5	0.8	1.6	2.8
Real private consumption	0.6	2.1	0.6	1.0	1.9	3.5
Export volume	0.4	1.3	0.3	1.3	0.8	3.1
Import volume	1.4	4.8	1.3	3.3	3.8	9.0
Terms of Trade	0.1	0.4	-0.1	-0.3	-0.3	-1.0
BT/GDP	-0.4	-1.4	-0.4	-0.9	-1.31	-2.8
Household utility index	0.6	2.0	0.5	0.7	1.5	2.5
Equivalent variation (US$ millions)	73.2	246.0	56.5	91.9	188.9	311.2
SAARC:						
Change in real GDP	0.1	0.1				
Real private consumption	0.1	0.1				
Export volume	0.1	0.2				
Import volume	0.2	0.4				
Terms of Trade	0.0	0.1				
BT/GDP	-0.0	-0.0				
Household utility index	0.1	0.1				
Equivalent variation (US$ millions)	247.9	566.6				
ASEAN-4:						
Change in real GDP			0.0	0.0		
Real private consumption			0.0	0.1		
Export volume			0.0	0.0		
Import volume			0.0	0.1		
Terms of Trade			0.0	0.0		
BT/GDP			-0.0	-0.0		
Household utility index			0.0	0.0		
Equivalent variation (US$ millions)			83.1	212.1		
OAC:						
Change in real GDP					0.0	0.0
Real private consumption					0.0	0.1
Export volume					0.0	0.0
Import volume					0.0	0.1
Terms of Trade					0.0	0.0
BT/GDP					-0.0	-0.0
Household utility index					0.0	0.0
Equivalent variation (US$ millions					268.1	630.8

Source: Author's simulations of GTAP.

Note: All projections are percentage deviations from the base except the balance of trade (BT) and quivalent variation (EV). BT is expressed as absoulte percentage-point change whereas EV is measured in US$ millions.

Table 6: Macroeconomic Effects of Bilateral Tariff Cuts on all Manufactures

Region	SAARC		ASEAN-4		OAC	
	50% removal of ad valorem import tariffs	Complete removal of ad valorem import tariffs	50% removal of ad valorem import tariffs	Complete removal of ad valorem import tariffs	50% removal of ad valorem import tariffs	Complete removal of ad valorem import tariffs
Sri Lanka:						
Change in real GDP	0.5	1.6	0.2	0.2	1.6	2.7
Real private consumption	0.6	1.9	0.2	0.3	1.9	3.4
Export volume	0.6	1.9	0.7	2.1	0.9	3.6
Import volume	1.6	5.2	1.1	2.8	3.8	9.2
Terms of Trade	0.0	0.3	-0.2	-0.6	-0.3	-1.0
BT/GDP	-0.4	-1.8	-0.3	-0.6	-1.3	-2.7
Household utility index	0.6	1.9	0.1	0.0	1.5	2.4
Equivalent variation (US$ millions)	68.6	233.5	15.7	-11.1	186.5	293.9
SAARC:						
Change in real GDP	0.1	0.1				
Real private consumption	0.1	0.2				
Export volume	0.1	0.2				
Import volume	0.2	0.5				
Terms of Trade	0.0	0.1				
BT/GDP	-0.0	-0.0				
Household utility index	0.1	0.1				
Equivalent variation (US$ millions)	282.7	640.4				
ASEAN-4:						
Change in real GDP			0.1	0.2		
Real private consumption			0.1	0.2		
Export volume			0.1	0.3		
Import volume			0.2	0.5		
Terms of Trade			0.1	0.2		
BT/GDP			-0.0	-0.0		
Household utility index			0.1	0.3		
Equivalent variation (US$ millions)			616.2	1482.8		
OAC:						
Change in real GDP					0.0	0.0
Real private consumption					0.0	0.1
Export volume					0.0	0.1
Import volume					0.0	0.1
Terms of Trade					0.0	0.0
BT/GDP					-0.0	-0.0
Household utility index					0.0	0.0
Equivalent variation (US$ millions					277.2	657.8

Source: Author's simulations of GTAP.

Note: All projections are percentage deviations from the base except the balance of trade (BT/GDP) and quivalent variation (EV). (BT/GDP) is expressed as absoulte percentage-point change whereas EV is measured in US$ millions.

of tariff reductions: 50 per cent reduction of ad valorem tariffs and full removal of tariffs. It appears from the results that Sri Lanka is better off by engaging in higher level of tariff reductions against imports from SAARC as well as ASEAN-4 and OAC. A full removal of tariffs against these regions has increased the real GDP within the range of 0.5 to 2.8 per cent. The increased balance of trade deficit that followed by the liberalisation is partly responsible for the moderate GDP projection. Though the domestic exports increase with liberalised trade, the rapid expansion in imports make trade deficit widening in each liberalisation scenario. The situation is further aggravated by the deterioration in terms of trade when tariffs are reduced against ASEAN-4 and OAC. Both household utility index and the equivalent variation (EV), which is a dollar value measure of the change in welfare (or utility), show that Sri Lanka may experience some welfare gains with intensive trade liberalisation arrangements with all three regions.

In comparison to SAARC and ASEAN-4 outcomes, bilateral trade liberalisation of MNF with OAC appears to be more promising for Sri Lanka. Though there would be a trade deficit in the end, the expansion in domestic consumption tends to outweigh the negative impact of such deficit, making economy better off overall in terms of expansion in real GDP and improved welfare. It is interesting to note that the higher the liberalisation with OAC higher the gains for Sri Lanka from trade.

As revealed by the macroeconomic projections in Table 6 (see first panel), inclusion of MF imports to the trade liberalisation agenda with SAARC and ASEAN-4 does appear to have reduced the welfare gains which were experienced prior to the inclusion of MF. As food imports become liberalised with ASEAN-4, Sri Lanka experiences substantial welfare losses as revealed by the estimates of equivalent variation. Projections are more sensitive to full liberalisation, indicating the unfavourable effects of trade diversion. The deteriorated term of trade could have perhaps contributed to this negative outcome. Conversely, the tariff cuts against imports of both MNF and MF from OAC does not show any significant welfare losses for Sri Lanka relative to gains projected prior to the inclusion of food.

Tables 7 and 8 report the sectoral output responses to bilateral tariff cuts. As tariff barriers on MNF are reduced bilaterally with the SAARC region, the sector experiences very large output gain under complete removal of protection. This output gain is almost reduced to a 4th when tariff cut is confined to 50 per cent. The general expansion of this sector is an indication of availability of cheaper imports that are used by the sector itself as intermediate inputs following the liberalisation. Textile is one of the sub-components in this sector which accounts for a large proportion manufacturing exports of Sri Lanka. The performance of the construction sector is remarkable in response to liberalisation. It is advantaged by the cheaper building material imported under the reduced protection. As would be expected, tariff reduction hearts the sectors which have links to domestic primary goods producing sectors, namely manufacturing-food and mining. The decline in the former is immediately transmitted to the agricultral sector of the economy. As would be observed from Table 8, inclusion of manufactured foods into the liberalisation process with SAARC tends to yield almost identical sectoral results.

Table 7: Impact on Sectoral Otputs of Bilateral Tariff Reductions on Non-Food Manufactures

Region	SAARC		ASEAN-4		OAC	
	50% removal of ad valorem import tariffs	Complete removal of ad valorem import tariffs	50% removal of ad valorem import tariffs	Complete removal of ad valorem import tariffs	50% removal of ad valorem import tariffs	Complete removal of ad valorem import tariffs
Sri Lanka:						
Agriculture	0.0	0.1	0.0	0.0	0.1	0.2
Mining	-0.9	-3.0	-0.7	-1.4	-2.0	-4.1
Manufacturing-food	-0.1	-0.3	-0.1	-0.3	-0.1	-0.6
Manufacturing-nonfood	0.8	3.1	0.6	1.6	1.5	3.9
Utilities	0.5	1.8	0.4	0.7	1.2	2.3
Construction	1.9	5.8	1.8	4.2	5.9	12.6
Trade and transport	0.6	1.8	0.5	0.8	1.5	2.7
Financial & business services	0.2	0.6	0.1	0.1	0.5	0.6
Other services	0.8	2.7	0.6	1.0	2.0	3.3
SAARC:						
Agriculture	0.0	0.0				
Mining	0.0	0.0				
Manufacturing-food	0.0	0.0				
Manufacturing-nonfood	0.1	0.1				
Utilities	0.1	0.1				
Construction	0.1	0.2				
Trade and transport	0.1	0.2				
Financial & business services	0.1	0.1				
Other services	0.1	0.1				
ASEAN-4:						
Agriculture			0.0	0.0		
Mining			0.0	0.0		
Manufacturing-food			0.0	0.0		
Manufacturing-nonfood			0.0	0.1		
Utilities			0.0	0.0		
Construction			0.0	0.0		
Trade and transport			0.0	0.0		
Financial & business services			0.0	0.0		
Other services			0.0	0.0		
OAC:						
Agriculture					0.0	0.0
Mining					0.0	0.0
Manufacturing-food					0.0	0.0
Manufacturing-nonfood					0.0	0.0
Utilities					0.0	0.0
Construction					0.0	0.0
Trade and transport					0.0	0.0
Financial & business services					0.0	0.0
Other services					0.0	0.0

Source: Author'simulations of GTAP.

Note: All projections are percentage deviations from the base.

Table 8: Impact on Sectoral Otputs of Bilateral Tariff Reductions on all Manufactures

Region	SAARC		ASEAN-4		OAC	
	50% removal of ad valorem import tariffs	Complete removal of ad valorem import tariffs	50% removal of ad valorem import tariffs	Complete removal of ad valorem import tariffs	50% removal of ad valorem import tariffs	Complete removal of ad valorem import tariffs
Sri Lanka:						
Agriculture	0.0	0.1	0.0	0.0	0.1	0.1
Mining	-0.8	-3.0	-0.2	-0.3	-2.0	-3.9
Manufacturing-food	-0.2	-0.2	-0.8	-2.0	-0.3	-1.2
Manufacturing-nonfood	0.9	3.1	0.6	1.5	1.5	4.0
Utilities	0.5	1.8	0.2	0.2	1.2	2.2
Construction	1.8	5.8	1.2	2.6	5.8	12.3
Trade and transport	0.5	1.8	0.2	0.1	1.5	2.6
Financial & business services	0.2	0.6	0.0	-0.2	0.5	0.6
Other services	0.7	2.4	0.1	-0.3	1.9	3.0
SAARC:						
Agriculture	0.0	0.1				
Mining	0.0	-0.1				
Manufacturing-food	0.0	0.1				
Manufacturing-nonfood	0.1	0.1				
Utilities	0.1	0.2				
Construction	0.1	0.2				
Trade and transport	0.1	0.2				
Financial & business services	0.1	0.2				
Other services	0.1	0.2				
ASEAN-4:						
Agriculture			0.0	0.1		
Mining			0.0	-0.1		
Manufacturing-food			0.3	0.7		
Manufacturing-nonfood			0.1	0.2		
Utilities			0.1	0.2		
Construction			0.1	0.2		
Trade and transport			0.0	0.1		
Financial & business services			0.0	0.1		
Other services			0.1	0.3		
OAC:						
Agriculture					0.0	0.0
Mining					0.0	0.0
Manufacturing-food					0.0	0.0
Manufacturing-nonfood					0.0	0.0
Utilities					0.0	0.0
Construction					0.0	0.0
Trade and transport					0.0	0.0
Financial & business services					0.0	0.0
Other services					0.0	0.0

Source: Author'simulations of GTAP.

Note: All projections are percentage deviations from the base.

Structural adjustments experienced by the Sri Lankan economy are different to some extent when liberalisation efforts are diverted towards ASEAN-4 and OAC. While tariff cuts on MNF boosts that sector, rapid expansion in the construction, utilities and services become significant. Again, it is due to the fact that the availability of cheap imports and the general expansion of the domestic economy. The adverse impact on the mining sector on the other hand is much larger when trade is liberalised with OAC. What would be the outcome in terms of sectoral adjustments when MF are also included into liberalisation program of ASEAN-4 and OAC? All sectors show reduced performance in response to such tariff cuts.

Table 9: Impact on Sectoral Employment in Sri Lanka of Bilateral Tariff Reductions

	SAARC		ASEAN-4		OAC	
Region	50% removal of ad valorem import tariffs	Complete removal of ad valorem import tariffs	50% removal of ad valorem import tariffs	Complete removal of ad valorem import tariffs	50% removal of ad valorem import tariffs	Complete removal of ad valorem import tariffs
Tarff cuts on MNF only:						
Agriculture	0.1	0.4	0.1	0.2	0.4	0.7
Mining	-0.8	-2.8	-0.6	-1.3	-1.9	-3.7
Manufacturing-food	0.9	3.1	0.8	1.5	2.4	4.6
Manufacturing-nonfood	1.7	5.9	1.3	3.0	3.6	8.3
Utilities	1.6	5.6	1.3	2.7	4.0	8.1
Construction	2.4	7.6	2.3	5.1	7.2	15.5
Trade and transport	1.2	3.9	1.0	1.9	3.1	5.9
Financial & business services	0.5	1.6	0.4	0.6	1.3	2.1
Other services	0.8	2.7	0.6	1.0	2.0	3.4
Tariff cuts on all manufactures:						
Agriculture	0.1	0.4	0.0	0.0	0.4	0.7
Mining	-0.8	-2.8	-0.2	-0.2	-1.8	-3.5
Manufacturing-food	0.8	3.2	-0.5	-1.4	2.2	3.7
Manufacturing-nonfood	1.7	5.9	0.8	2.0	3.6	8.3
Utilities	1.6	5.5	0.5	0.8	4.0	7.8
Construction	2.3	7.5	1.4	2.9	7.1	15.1
Trade and transport	1.1	3.8	0.4	0.5	3.0	5.6
Financial & business services	0.4	1.5	0.1	-0.1	1.2	2.0
Other services	0.7	2.5	0.1	-0.3	2.0	3.1

Source: Author's simulations of GTAP.
Note: All projections are percentage deviations from the base.

Results reported in Tables 9 may be viewed as labour market adjustments in the Sri Lankan economy in response to the bilateral liberalisation attempt by the economies in the region. Looking from Sri Lanka's viewpoint, demand for labour would increase in all the sectors with the exception of mining sector with liberalised trade in MNF. Naturally, the unskilled labour is in a better position to experience more job opportunities under the free trade regime. It is interesting to note that a free trade area with ASEAN-4 region may create less job opportunities in comparison to that with SAARC and OAC. Other important feature is that improved trade with OAC tends to open up more job opportunities for Sri Lanka's labour force. However, the prospects for creating new jobs are slightly diminished when MF are included into the liberalisation process (see panel two in Table 9).

Implication for Trading Partners:

Having analysed the effects on the Sri Lankan economy of each liberalisation program, it is appropriate to examine briefly the outcomes that may be experienced by the respective trading partners. Looking through the macroeconomic projections of Tables 5 and 6, it is apparent that the magnitudes of the responses of each region are relatively small. This is because Sri Lanka is a minor trading partner for those regions. Amongst the three regions, SAARC appears to have experienced relatively significant impact. ASEAN-4 and OAC have responses which are mostly close to zero. One important finding is that all bilateral tariff reduction programs that have been considered in this analysis tend to benefit Sri Lanka's trading partners in terms of improved welfare (see estimates equivalent variation).

It is clear that Sri Lanka's attempt to liberalise trade with SAARC will result in a welfare gain to SAARC region which is more than double the Sri Lanka's gain. Similar observation could be made with respect to ASEAN-4 and OAC. Though these regions tend to experience trade deficits in response to bilateral tariff cuts with Sri Lanka, they are not that severe in comparison to Sri Lanka's respective deficits[2]. In all the cases, the trade deficit is less than 0.1 per cent of the base period GDP. In the event of the inclusion of MF into liberalised trade, the SAARC region appears to experience much greater welfare gains. While OAC also respond in a similar fashion, we observe a remarkable increase in welfare in ASEAN-4 as we include food imports into liberalised trade policy. For the latter, our results suggest that more free trade with Sri Lanka in MF mean better outcome in welfare for them.

Turning to the sectoral adjustments in these regions, we observe from Tables 7 and 8 that the SAARC region experiences minor output gains in most sectors. However, sectoral response in ASEAN-4 and OAC are negligible with liberalised trade in MNF. Interestingly, the incorporation of food imports into the liberalisation process is likely to bring some structural adjustments in ASEAN-4 as evidenced by the output projections (see Table 8). OAC undergo almost no output change in all sectors, confirming that the creation of a free trade area with Sri Lanka has no discernible effect on the domestic economy.

[2] Notice that Sri Lanka's experience in negative trade balance varies from 0.4 per cent of GDP to 2.8 per cent in different simulations (see Tables 5 and 6).

VI Conclusion

This paper has examined several trade liberalisation options for Sri Lanka within a bilateral regional trading arrangement framework. We performed a series of tariff reduction simulations using a world CGE model, namely GTAP. Analysis was confined to Sri Lanka's bilateral trade with SAARC, ASEAN-4, and OAC. Projections were obtained by reducing tariffs on MNF first and then by incorporating manufactured foods to uncover the likely implications for the domestic agriculture and welfare of the latter.

Results lead to the general conclusion that bilateral trade liberalisation with SAARC region is beneficial to the Sri Lankan economy as shown by both real GDP and welfare gain projections. Such approach to trade liberalisation enhances the domestic consumption as import becomes much cheaper but growth in exports is insufficient to pay for the increased importation.Thus the net outcome is the trade deficit which forces Sri Lanka's real GDP to grow by a very narrow margin. Of course, the impact varies across the trading partners considered in this paper. The impact on GDP is greater with bilateral tariff reductions with the OAC followed by the SAARC region. This is due to the fact that SAARC has become an important source of imports to Sri Lanka but as a destination of exports, the potential of that region is yet to be seen. With ASEAN-4, the welfare effect is relatively small but unfortunately it contracts with the inclusion of MF into the liberalisation agenda. One good news is that higher liberalisation with OAC tends to improve Sri Lanka's welfare significantly.

What would be the verdict if Sri Lanka agreed to liberalise its imports of manufactured food bilaterally? The findings here send mixed signals as it would not be as harmful as one would think to the domestic agriculture as well as to the food-manufacturing sector. However, the overall welfare gains may be reduced to some extent with the inclusion of food imports to the liberalisation of trade.

Bilateral trading arrangements will have milder impact on Sri Lanka's Asian trading partners. It appears that SAARC region is more responsive to such trade pacts than ASEAN-4 and OAC. The latter is least sensitive to any bilateral tariff reductions with Sri Lanka even though Sri Lanka seems to be gaining from mutual trade with them. On the other hand, ASEAN-4 becomes much more responsive in the event of gaining access to liberalised trade in MF with Sri Lanka.

The findings of the paper are subject to some reservations. The CGE model used in the analysis is a comparative static one and therefore ignores adjustment costs as trade liberalisation takes place. The model is based on the constant returns to scale assumption and therefore misses scale economies which may be important for the analysis of trade liberalisation. Perhaps these shortcomings may not severely restrict our findings because we have concentrated on the short-run effects.

References

Athukorala, p. and Kelegama, S. (1998), "The pilitical economy of agricultural trade policy: Sri Lanka in the Uruguay Round", *Contemporary South Asia*, 7: 7-26.

Bandara, J. S. and Mcgillivray, M. (1998), "Trade Policy Reforms in South Asia", *The World Economy*, 21: 881-896.

Central Bank of Sri Lanka (1999, pp.138-39), *Annual Report: 1998*, Colombo, Sri Lanka.

Krueger, A. O. (1999), "Are Preferential Trading Arragements Trade-Liberalizing or Protectionist?", *Journal of Economic Perspectives*, 13: 105-124.

De Melo, J., Panagariya, A., and Rodrik, D. (1992), "Regional Integration: An Analysis and Empirical Overview", World Bank Conference on "New Dimensions in Regional Integration".

DeRosa, D.A. and Govindan, K. (1996), "Agriculture, Trade, and Regionalism in South Asia", *Journal of Asian Economics*, 7: 293-316.

Dixon, P.B., Parmenter, B.R., Sutton, J. and Vincent, D.P. (1982), *ORANI: Multisectoral Model of the Australian Economy*, North-Holland, Amsterdam.

Hertel, T.W. (1996), *Global Trade Analysis: Modelling and Applications*, Cambridge University Press, New York and Cambridge.

International Monetary Fund, *Direction of Trade Statistics Yearbook*, various issues.

McDougall, R.A., Elbehri, A. Truong, T.P. (1998*), Global Trade, Assistance, and Protection*, Centre for Global Trade Analysis, Purdue University.

Mukherji, I N. (1998), "The South Asian Preferential Trading Arrangement: Identifying Products in India's Regional Trade", *Asia-Pacific Development Journal*, 5:

Panagariya, A. (1998), "The South Asian Preferential Trading Arrangement: Identifying Products in India's Regional Trade", *Asia-Pacific Development Review*, 5:

Panagariya, A. (1999), "The Trade Policy in South Asia: Recent Liberalisation and Future Agenda", *The World Economy*, 22: 353-377.

Rajapakse, P (1996), "The Implications of the Emerging Trading Environment for Sri Lanka", *Asian Development Review*, 14: 116-151.

Rajapakse, P. and Arunatilleke, N. (1997), "Would a Reduction in Trade Barriers Promote Intra-SAARC Trade?", A Sri Lankan Perspective", *Journal of Asian Economics*, 8: 95-115.

Sirinivasan, T.N. (1994), "Regional Trading Arrangements and Beyond: Exploring some Options for South Asia: Thory, Empirics, and Policy", Report No. IDP-142, World Bank, Washinton D.C.

Sirinivasan, T.N. (1998), *Developing Countries and the Multinational Trading System: From GATT to the Uruguay Round and the Future*, Delhi: Oxford University Press.

Appendix Table A1: Regional and Commodity Aggregation

Aggregated Region	GTAP Region	Aggregated Commodity	GTAP Commodity
1 Sri Lanka	Sri Lanka	1 Agriculture	Paddy rice
			Wheat
2 SAARC	India		Cereal grains nec
	Rest of South Asia		Vegetables, fruits, nuts
			Oil seeds
2 ASEAN-4	Indonesia		Sugar cane, sugar beet
	Malaysia		Plant-based fibers
	Philippines		Crops nec
	Thailand		Bovine cattle, sheep & goats
			Animal products nec
3 Other Asian Countries (OAC)	Chins		Raw milk
	Hong Kong		Wool silk-worm cocoons
	Taiwan		Forestry
	Singapore		Fishing
	Korea		
	Vietnam	2 Mining	Coal, Oil, Gas,
			Minerals nec
4 Industrialised Countries (ICs)	Australia		
	New Zealand	3 Manufacturing-food (MF)	Bovine cattle, sheep and
	Japan		goat, horse meat products
	U.S.A.		Meat products nec
	Canada		Vegetable oils and fats
	United Kingdom		Dairy products
	Germany		Processed rice
	Denmark		Sugar
	Sweden		Food products nec
	Finland		Beverages & tobacco prods
	Rest of European Union		
	Iceland, Norway, Switzerland	4 Manufacturing-nonfood (MNF)	Textiles
			Wearing apparel
5 Rest of the World (ROW)	Rest of the World (20 regions)		Leather products
			Wood products
			Paper products, publishing
			Petroleum, coal products
			Chemical, rubber, plastic
			Mineral products nec
			Ferrous metals
			Metals nec
			Metal products
			Motor vehicles and parts
			Transport equipment nec
			Electronic equipment
			Machinery & equipment nec
			Manufactures nec
		5 Utilities	Electricity
			water
			Gas manufacture, distribution
		6 Construction	Construction
		7 Transport & communication	Trade, transport
		8 Financial & business services	Financial, business, recreational services
		9 Other services	Public admin. & defence, education, health
			Dwellings

Source : McDougall et al. (1998).