CHAPTER II

LITERATURE REVIEW AND METHODOLOGY

2.1   Introduction

This chapter is devoted to undertake the literature review and the methodology of the study. Section 2.2 presents the literature review which illustrates the empirical investigations and theoretical concepts to shed light into the research. Further, the rules and regulations of World Trade Organization (WTO) will be examined to understand the legal framework of economic integration. The methodology of the study will be presented in section 2.3 which presents the overview of the GTAP model and the simulation design to analyze the impact of different policy options on Sri Lankan economy.

2.2   Literature Review

2.2.1   Review of Empirical Studies

The impact of both SAPTA and SAFTA has received attention in different studies. Only a few studies, however, have attempted to quantify the possible economic impacts on the member countries. Such impact assessment is necessary to decide upon an arrangement, which at least will not be harmful for any of the members. The existing studies reflect the lack of consensus about the economic outcomes of preferential trade arrangements in the SAARC region on its member countries. The empirical studies will be reviewed under the following categories.

I.   South Asia Regional Integration and its impact on Sri Lankan economy

a)   The study undertaken by Dushini Weerakoon and Janaka Wijayasirsi, 2001 has been used descriptive analysis to investigate South Asian regional integration on Sri Lankan economy. The study mentioned that, in the case of Sri Lanka, SAPTA has had no discernible impact on Sri Lanka's trade in South Asia. This has been due to the

limited number of concessions, the irrelevance of much of the concessions that have been offered, limited depth of tariff cuts, failure to deal with non tariff issues and restrictive rules of origin. This is because, Sri Lanka's export to South Asia in 1999, mainly consisted of vegetable products, textile articles, plastic and rubber articles and base metals. But most of the preferential tariff concessions offered to Sri Lanka are irrelevant to Sri Lanka's export interest and thus do not generate much benefit. Therefore, SAPTA has been ineffective in raising the share of Sri Lanka's exports to SAARC. However, Sri Lanka's share of imports from SAARC has remained fairly constant. The study mentioned that SAPTA has had no significant impact in changing the existing trade pattern of Sri Lanka vis-à-vis its South Asian partners.

The study analyses the impact of Indo-Lanka FTA and it was revealed that FTA has more benefits and confer freer access for Sri Lankan exports to the Indian market. Thus, Indo-Lanka FTA has been far more generous in reducing tariff barriers bilaterally than that offered by the SAPTA. Further, it mentioned that bilateral trade arrangements can undermine broad support for formation of SAFTA. Moreover, the study raises the issue how bilateral agreements are to be treated vis-s-vis SAFTA negotiations? Will they be incorporated into the SAFTA process or will they stand as separate bilateral trade agreements? The study suggests the SAARC leaders to rethink its approach to the trade negotiations in order to achieve regional cooperation in South Asia.

b)   Purnima Rajapakse and Nisha Arunatilake (1997) used gravity model to study the implications of reduction in trade barriers in promoting intra-SAARC trade. The paper analyses some of the impediments to intra SAARC trade and pointed out that high tariff and non tariff barriers, low complementarities in the products of the region, countries having similar production structures, inadequate transportation links, lack of marketing and distributional skills, high cost of insurance and finance and lack of standardization of documentation and complexity of procedures are the factors that hindering intra regional trade in the region. Further, the study analyses that whether foreign direct investment can promote trade within SAARC and the domestic issues that need to be resolved to attract the desired investments.

The gravity model has been used to analyses the potential of Sri Lanka has in improving its trade with other SAARC countries with further liberalization of their economies and found that Sri Lanka's trade with SAARC countries is likely to improve

considerably with further liberalization of their economies. Moreover, it found that the potential improvements in trade with India are quite substantial. However, it mentioned that none of the SAARC countries can hope to achieve sustainable economic growth merely by trading amongst themselves. The trade expansion within SAPTA and the realization of the objectives of creating a SAFTA would require serious political commitment into intra-regional trade.

II. Impact of Regional Integration on members of SAARC

a)   Bandara and Yu (2001) examined whether SAFTA is a desirable Preferential Trade Arrangement (PTA) or not. They analyzed the necessary conditions for forming a PTA and later used the GTAP model to quantify the effects of SAFTA compared to other policy options. The study conducted six policy scenarios, namely; unilateral trade liberalization by South Asian countries, preferential trade liberalization in South Asia, preferential trade liberalization between South Asia and ASEAN, preferential trade liberalization between South Asia and NAFTA, preferential trade liberalization between South Asia and EU and multilateral trade liberalization.

The result suggests that under unilateral liberalization scenario, India would gain substantially, while NAFTA and EU, the biggest trading partners of South Asian countries would also gain. Sri Lanka and Bangladesh would also gain considerably while rest of South Asia would lose.

Under SAFTA scenario, India would be the only significant welfare gainer, while small countries gain marginally. Bangladesh is even expected to lose.

As the scope of preferential trade liberalization widens from SAFTA to ASEAN plus SAFTA, the welfare results change remarkably. This policy scenario suggests that it is not a good idea for South Asian countries to join ASEAN because all South Asian countries including India would be adversely affected in terms of welfare. This is because that ASEAN countries producing competing goods against South Asian countries and some advanced manufactured goods. However, preferential trade between South Asia and EU or NAFTA is expected to be beneficial to South Asia. Finally, South Asian countries may gain much more from multilateral trade liberalization than from the current SAPTA or the proposed SAFTA.

b)   Studies by Srinivasan (1994) and Srinivasan and Canonero (1995) have used the gravity model to estimate the impact of regional integration in South Asia. They concluded that multilateral trade liberalization on a global basis would yield higher return for the region compared to preferential trade arrangements within the region. Their studies also suggest that small economies in the region would gain much more from preferential trade liberalization than larger economies.

c)   After the SAPTA turned to SAFTA, some studies looked at the potential impacts of the latter. Pigato *et.al* (1997) found SAFTA to be "highly desirable" notifying that this would result in significant welfare gains especially for small counties. However, Tennagoon (2001) concludes that SAFTA would generate significant benefits for Sri Lanka and India, while it would have adverse welfare effects for the other SAARC members.

d)   Samaratunge (1999) has also used the gravity model to explore the impacts of SAARC-Asia-Pacific Economic Cooperation (APEC) trade relations. The study indicates that the prospects for export expansion of SAARC region into APEC countries is narrow within 1991-1995 policy framework.

e)   Hirantha (2004), used gravity model to investigate impact of SAFTA on SAARC members. The analysis of the study showed strong evidence of trade creation in the region under SAPTA with no trade diversion effect as far as trade with non-members is concerned. Further, the study mentioned that it is evident that trade creation under SAPTA bode well for the proposed FTA (SAFTA), which will come into effect in 2006.

f)   Arvind Panagariya (2001), uses the Partial Equilibrium Analysis to investigate the whether preferential trade liberalization in South Asia make sense, found that forming a South Asian FTA will probably prove harmful effects overall, however, with a low-tariff country such as Sri Lanka benefiting and high tariff country such as India hurting. Therefore, it was mentioned that on economic grounds, a persuasive case for the FTA cannot be made.

Further, study found that instead all trade diversion can be avoided if the countries in the region were to liberalize on a non discriminatory basis.

When analyzing findings of the former research article it is apparent that different researchers expressed divergent views about the possible impact of SAFTA on the member countries.

III. Impact of the Indo-Lanka FTA on SAARC members

Mahinda Siriwardena (2004) used GTAP model to investigate the impact of Indo-Lanka free trade agreement (ILFTA) and its implications for free trade in South Asia. The study conducted three simulations to present three trade liberalization scenarios:

- **Indo-Lanka Partial Free Trade**

From the results it was revealed that the FTA has much bigger impact on the Sri Lankan economy than on the Indian economy. Sri Lanka's real GDP increases by 0.24 percent whereas only a negligible change in India's real GDP (0.02 percent). However, the terms of trade decline for Sri Lanka may be due to smallness of export trade with India. The unskilled labour force in Sri Lanka may experience a considerable improvement in their real incomes as a result of trade liberalization and labour intensive export oriented sectors such as textiles, and weaving apparel and leather. Many sectors respond positively to the bilateral tariff cuts. As agricultural sectors face no reduction in tariffs under the arrangements of "negative list", tariff reforms tend to reduce most of the sectoral outputs. The welfare gains as projected by the equivalent variation is positive for both trading partners.

- **Indo-Lanka Rest of South Asia Partial Free Trade Scenario**

Under this simulation it was found that this FTA tends to have much bigger impact on real GDP of both Sri Lanka and India than Rest of South Asia (RSA). India turns out to be a considerable gainer from this, and Sri Lanka and RSA are projected to lose their overall welfare despite improvements in their GDP. Sri Lanka consolidates its sectoral output changes in mining, manufacturing and service sector at the expense of its agricultural sectors. The export projections indicate that Sri Lanka and India improve their export volumes considerably and RSA also keeps up with the regional trend.

- **Indo-Lanka-Rest of South Asia Full Free Trade Scenario**

The policy of full trade in South Asia is by far the best option for both India and Sri Lanka. The extension of the agreement to all SAARC nations under SAFTA is likely to benefit the region as a whole by increased trade within South Asia. Tension may arise between agriculture and manufacturing under free trade in South Asia, as the latter is likely to expand faster with the removal of trade barriers. The SAARC nations should work hard to implement the SAFTA as soon as possible as it appears more beneficial than bilateral trade liberalization for real GDP growth in the region.

IV. Studies by the other Members of the SAARC on the Regional Integration

The following researchers carried out studies about regional integration of South Asian and its impact on to their respective economies.

a) Impact of SAFTA and other policy options on Bangladesh Economy

A study undertaken by group of researchers in Bangladesh ((M. Asaduazzaman, Nazeen Ahmed, Sharif M. Hossain, Subruta Sarker: 2003) used GTAP model to quantify the welfare impact of SAFTA and other policy options on Bangladesh economy.

The study conducted seven simulations, namely; Indo-Lanka FTA, SAFTA, South Asian Custom Union, multilateral trade liberalization, Bangladesh India FTA, Bangladesh Sri Lankan FTA and Bangladesh India Sri Lanka tripartite FTA.

From the results it was revealed that Bangladesh losses due to FTA between India and Sri Lanka because her export industry is losing, as Sri Lanka is now better poised to reap the benefits of the large Indian market. Further, it indicated that both India and Sri Lanka experience welfare gain. Export of wearing apparel from Bangladesh to both India and Sri Lanka is declining, which points out the trade diversion impacts of India Sri Lanka FTA.

The study found that the multilateral trade liberalization would be the better out come for all SAARC countries. However, it further, mentioned that SAFTA generates positive outcome for Bangladesh as well as other SAARC countries and South Asian

Custom Union generates much better outcome than SAFTA alone. However, Bangladesh Sri Lanka FTA would generate only a small welfare gain for Bangladesh. Among the regional preferential arrangement options, the best scenario is tripartite free trade agreement between Bangladesh, India and Sri Lanka. In these cases the effect on output is very marginal for all commodities except some positive impact on wearing apparel, leather and capital intensive manufacturing sector. Output agricultural commodities such as rice, grains, oil and oil seeds, raw milk and diary products decline marginally. Since, South Asian Region is in general a labour surplus region with high unemployment, much of the welfare gain occurs due to increase in employment of unskilled labour.

b)   The SAFTA and the Role of India in Trade Liberalization

Indra Nath Mukherji (2004), used descriptive method to investigate the role of India in trade liberalization in South Asia pointed out that four rounds of exchange of trade concessions have taken place under the South Asian Preferential Trading Arrangement (SAPTA) initiated since December 1995 and negotiations under SAPTA have been based on Positive List approach.

A large number of products have however been offered concessions exclusively to Least Developed Countries (LDCs). India has offered the largest number of concessions, particularly favouring LDCs with tariff preferences ranging from 50-100 percent. Further the paper examined the impact of tariff concessions on India's preferential trade in the first three rounds of SAPTA negotiations in relation to its total bilateral trade with Bangladesh, Maldives, Pakistan and Sri Lanka covering the period 1996-97 to 2002-03. The hypothesis was that tariff cuts are expected to induce faster growth in India's preferential trade in relation to its bilateral trade. The study revealed that owing to lack of proper targeting, low preferential margins, non-concern with a variety of non-tariff barriers, and the emergence of more ambitious Indo-Lanka Free Trade Agreement, the performance of India's preferential trade under SAPTA has been lackluster. However, there are a few hopeful points. There has been relatively better targeting of trade preferences between India and Pakistan leading to increasing share in India's preferential trade in recent years for products exchanged preferences in the Second Round. Bangladesh has been the main beneficiary of India's offer of duty-free access to least developed countries on selected products under the Third Round and

their immediate positive response in terms of increasing shares in India's preferential imports is just beginning to be observed. The paper suggested a few modalities to meet the required prerequisites for a smooth transition from SAPTA to SAFTA. Experience from the operation of SAPTA suggests that mere tinkering with modest preferential margins, maintaining unduly long phase-out period to attain the goal of a free trade area without concern for deeper forms of integration such as removal of non-tariff barriers, investment cooperation and improvement in trade facilitation measures could make SAFTA largely irrelevant.

c) SAFTA and Advantages and Challenges for Pakistan

A study undertaken by Pakistan Legislative Strengthening Consortium in 2004 mentioned that SAFTA will expand Pakistan's trade with member countries. This is mainly because of decrease in cost of production for the local industry due to availability of cheaper raw materials, intermediate and capital goods, increase industrial competitiveness and efficiency, provide greater market access to local producers, and therefore, leads to lower consumer prices and higher disposable incomes.

According to the Karachi Chamber of Commerce and Industry (KCCI), it was mentioned that the volume of intra-SAARC trade, after implementation of SAFTA will move to 20 per cent of total trade of member countries. It is believed that regional economic integration will allow Pakistan to deal more effectively with the challenges of globalization and improve its bargaining position in international trade negotiations. Further, it pointed out the informal trade that has been taken place between India and Pakistan will move to formal channel after implementation of SAFTA.

Moreover, the Karachi Chamber of Commerce mentioned that cheaper steel and iron ore imports from India will have a positive impact on the engineering sector. According to the South Asia Development and Cooperation Report 2001/2002, it was revealed that it would make more sense for Pakistan to import wheat from India instead of buying it from Canada and the US. The report estimated that this would entail a financial saving of $25 in freight charges alone on every tone of imported wheat. It also argued that Pakistan will benefit enormously by importing Tea from India, which it currently buys from Kenya at a much higher cost.

However, the study pointed out that the three principal segments of the economy most likely to be affected from trade with India are agriculture, textiles and the engineering sector and there will be significant impact on consumers through the availability of a wide range of agricultural, textile and engineering goods at lower prices. Some analysts believed that Pakistan's consumer and light engineering goods are uncompetitive due to under-capitalization, high costs, poor quality, bad management practices, and unscientific market research. It is also feared that free trade will allow Multinationals to relocate their manufacturing to lower cost areas, resulting in huge employment and revenue losses for Pakistan. An examination of academic research on sector wise impact of trade with India revealed that transport equipment, cement and pharmaceutical industries in Pakistan would be negatively affected by free trade with India. With the implementation of the SAFTA, Indian manufacturers will find no difficulty in capturing these markets. Therefore, the researchers suggested that it is thus imperative for the private sector and policy makers in Pakistan to understand how SAFTA will impact on them and devise a constructive and practical strategy for investments in trade infrastructure.

V. Informal Trade in the SAARC Region

Nisha Taneja, 1999 conducted a study to investigate illegal trade among the SAARC region. The most popular argument used to explain the occurrence of illegal trade is the presence of trade distortions across countries. Thus import restrictions; tariff barriers and differences in exchange rate regimes could lead to informal trade. Study mentioned that appropriate rules of origin requirements under FTA is needed to ensure that goods from third countries passing through another member country of the FTA before arriving at the final market for consumption, meet minimum processing requirements to benefit from duty free entry.

The study estimated that the total unofficial trade between Sri Lanka and India in 1991, was $264 million where as official trade was $186 million. For instance, gold and silver are smuggled in large quantities by sea from Sri Lanka to India, and in addition bulky items like electronic goods are also smuggled by sea in greater quantities. Further, estimated informal trade between India and Nepal has been placed at 8 to 10 times than

that of formal trade in 1990. Further, the unofficial Indo-Pakistan trade estimates to be $ 1 billion annually.

Moreover, it was revealed that the commodity baskets being traded officially and unofficially are different. It was found that large part of informal imports into India comprise of third country goods, informal exports to the South Asian countries consist of essential goods (both food and non-food) and mass scale (undifferentiated) consumer items.

The study mentioned that with SAFTA such informally traded goods would automatically shift to the formal channel and consequently India's official exports to South Asia will increase. However, since India's unofficial imports from South Asia consist largely of third country goods will not be affected by removal of trade barriers in the region. The net result of the SAFTA can be expected to worsen to the existing trade imbalance that India has with South Asian countries on the official account. However, a more balanced trade can be expected on the unofficial account.

VI. Studies by World Bank and other organizations

a)   In 1993, a study undertaken by the World Bank concluded that most of the pre-conditions required for successful trading arrangement were not present in South Asia (De Melo et al., 1993). These pre-conditions include:

• High pre-arrangement tariffs

• A high level of trade in the region before the arrangement

• The existence of complementary rather than competitive trade

• The difference in economic structures in countries concerned

The study found that only the first condition was met in the case of South Asia and it concluded that the region would be better off liberalizing trade unilaterally and by joining an already established group.

b)   The study conducted by the World Bank/ International Monetary Fund (2004) to investigate trade facilitation and regional integration: accelerating the gains to trade with capability building found that, the South Asian region has a significant opportunity to accelerate economic growth and reduce poverty through concrete actions to facilitate trade. This includes specifically investments in upgrading ports and information

technology infrastructure in the region. Further, reducing barriers to FDI, lowering tariff rates of protection, and eliminating other non-tariff barriers, which slow productivity and block private sector growth, are also important.

Further, the study identified that if countries in South Asia raise its capacity halfway to the East Asia's average, intra regional trade in the region can be estimated to rise by $2.6 billion. This is approximately 60 percent of the total intra-regional trade in South Asia.

In reviewing the former research studies, it could be seen that general equilibrium modeling is comparatively rare in SAARC region. Further, none of the studies focus on comparative study on impact of the SAFTA and other policy options on trade and welfare of the Sri Lankan economy. This thesis tries to fill up this gap in a modest way.

2.2.2   Theoretical Background on the Economic Integration

One notable trend in the global economy in recent years has been the accelerated movement toward regional economic integration. By regional economic integration means agreements between groups of countries in a geographic region to reduce, and ultimately remove, tariff and non-tariff barriers to the free flow of goods, services, and factors of production between each other.

I.   Regionalism and Bilateralism versus Multilateralism

"Regionalism", "regional trading agreement," and "regional trade area" are defined as groupings of countries which are formed with the objective of reducing barriers to trade between member countries. Contrary to what the name suggests, these groupings or unions may be concluded between countries not necessarily belonging to the same geographical region.

Bhagwati (1993) has pointed out, it encourages the countries to enter into preferential trade arrangements with geographically proximate countries rather than with distant ones, because the former would more likely be trade creating, lead to a larger improvement in welfare (of the home country), and thus be "natural", and the latter would more likely be trade diverting.

Depending upon their level of integration, RTAs can be broadly divided into five categories:

- **Preferential Trade Agreements (PTAs)** - A PTA is a union in which member countries impose lower trade barriers on goods produced within the union, with some flexibility for each member country on the extent of the reduction.

- **A Free Trade Areas (FTAs)** - A FTA is a special case of PTA where member countries completely abolish trade barriers (both tariff and non tariff barriers) for goods origination within the member countries. It should be clarified here that in most cases, countries do not abolish trade barriers completely even within Free Trade Areas. Most agreements tend to exclude sensitive sectors.

- **Custom Unions (CUs)** – A CU provides deeper integration that an FTA because, unlike FTAs where member countries are free to maintain their individual level of tariff barriers for goods imported from non-member countries, in a CU, member countries also apply a common external tariff (CET) on a good imported from outside countries. The CET can vary across goods but not across union partners.

PTA, FTA and CU are called "shallow integration" arrangements in trade literature. Apart from these shallow arrangements there are two types of regional agreements which provide "deep integration".

- **Common Markets** – where member countries attempt to harmonize some institutional arrangements and commercial and financial laws and regulations among themselves. A common market also entails free movements of factors of production, i.e. removal of controls on free movement of labour and capital.

- **Economic Union (EU)**- where countries implement common economic policies and regulations and adopt a single currency.

The relationship between the various levels of regional agreements is depicted in below figure 2.1.

Figure 2.1   **Levels of Economic Integration**
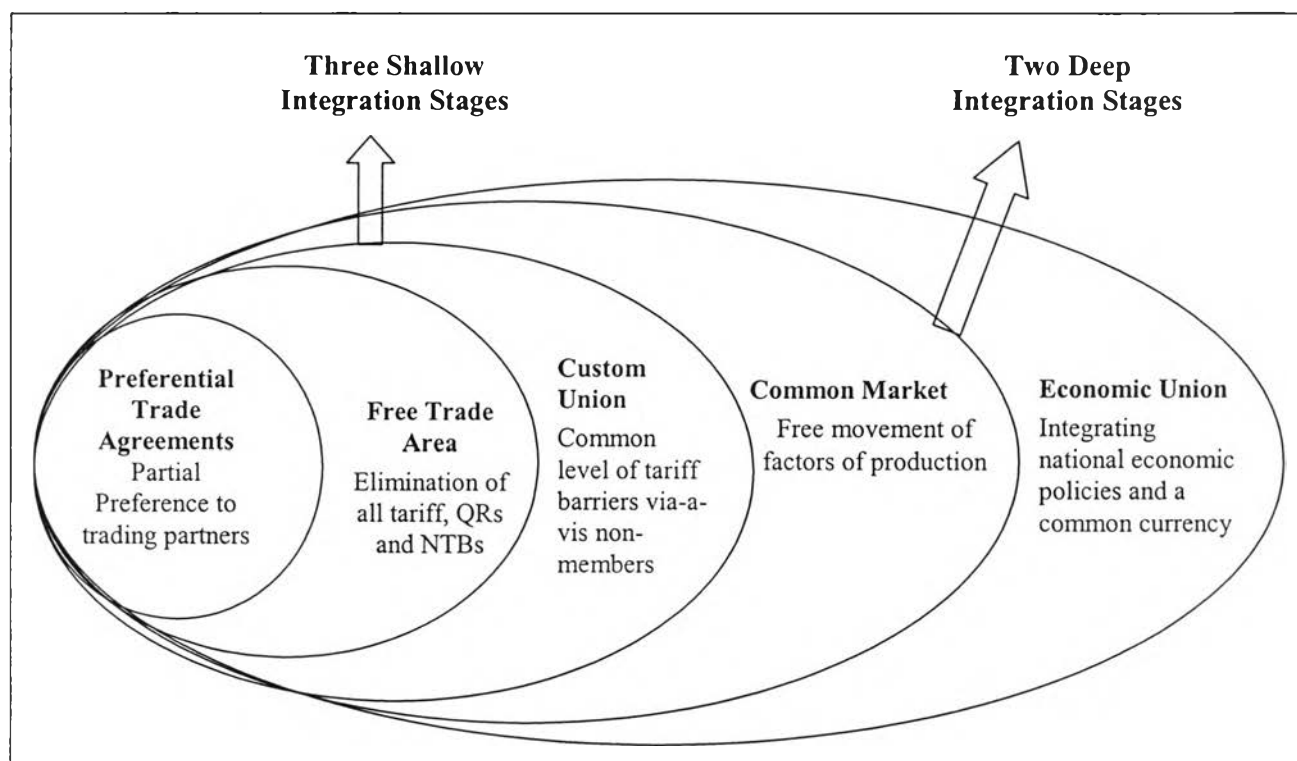
Source: Das (2001)

Bilateralism occurs when two countries or two trading blocs enter into free trade agreement so as to remove trade barriers among trading partners.

Like regionalism, "multilateralism" is a general term that has several meanings. Multilateralism also refers to the lowering of trade barriers on a nondiscriminatory, Most –Favored-Nation (MFN) basis, in which any tariff concessions granted to a partner are also extended to the rest of the world. This MFN based approach by an RTA can benefit all the countries, but there is the danger that nonmembers will "free ride" and accept an RTA's tariff reductions without lowering their own barriers.

In the multilateral system, progress towards free trade is slow because every country has a veto and fashioning trade-offs takes time. In a regionalized world, progress could be quicker, both within and between blocs. But irreconcilable differences could crop up under either approach become worse if countries focus more on regional or bilateral deals, they may start to feel that working through the WTO is simply not worth the candle. A free multilateral system might end up being replaced by one of several free-trade blocks, which may or may not trade more or less freely with each other.

II. Old and New Regionalism

The theoretical analysis of the impact of increased integration and trade liberalization has followed the historical trends. International trade theory has a long tradition of analysis of the impact of shallow integration i.e. liberalization of barriers to commodity trade. This work programme has resulted in an elegant and coherent body of general equilibrium trade theory that underlies most policy analysis of both global trade liberalization and regional integration, with broad consensus in the economics profession about the desirability of achieving free trade globally. Under global free trade, countries would reallocate factors of production to achieve structure of trade, production, and gains arising from increased efficiency, which is commonly called the Heckscher-Ohlin-Samuelson (HOS) theoretical framework.

Theoretical analysis of shallow regional trade agreements i.e. old regionalism is more complex, because it is inherently an exercise in "second best" analysis. Some distortions are eliminated (tariff on trade within the RTA), while others remain (e.g. domestic tax/subsidy policies and tariffs on non-RTA trade). The core theoretical analysis of shallow RTAs is the theory of custom unions, with seminal contributions by Viner (1950), Meade (1955), and Kemp and Wan (1976). In this framework, which adheres closely to the standard general equilibrium trade theory in the HOS framework, the welfare impact of an RTA is determined by a few crucial variables:

- changes in commodity trade in the countries within the RTA ("trade creation" effects)
- changes in trade between the RTA and the rest of the world ("trade diversion" effects)
- changes in international prices facing the countries ("terms of trade" effects).

In general, trade creation and terms of trade gains are welfare enhancing, and trade diversion and terms of trade losses are potentially damaging.

III. Theoretical Arguments: Trade Creation, Trade Diversion, Terms of Trade and the Welfare Effects of RTA's

Trade creation, trade diversion and terms of trade effects largely define the static welfare impacts of and RTA. Viner (1950) developed these concepts within a "second

best" theoretical framework in which countries form a custom union. Much of the welfare analysis also pertains to the formation of RTAs. Viner described the changes in the allocation of production and consumption following the union. Trade creation occurs when inefficient local production is replaced by more efficient output in another member of RTA as a result of lowering or removing the trade barriers within an RTA.

Trade diversion occurs when RTA members' import from partner countries replace imports from more efficient non-member countries, as a result of the RTA's tariff preferences. An RTA improves welfare for its members if the benefits of trade creation dominate the losses from trade diversion.

When countries are large enough to affect world market prices as a result of change in domestic trade policies, there are terms of trade effects in addition to the welfare effects from trade creation and trade diversion. When the price of a country's export relative to imports increases, its terms of trade improve and there is an additional welfare gain. When there are terms of trade changes, even an RTA that is trade diverting can result in a net welfare gain.

While there is a view that there are elements, in addition to resource reallocation, there is an important part of the theory in new regionalism, there is still widespread use of old trade theory to analyze RTAs, focusing only on trade creation, trade diversion and terms of trade changes.

Among with the emergence of deeper integration (involves additional elements of harmonizing national policies, and allowing or encouraging internal factor mobility) both globally and regionally, and the reliance on RTAs by developing countries, there is now emerging a body of "new trade theory" that has sought to incorporate the impact of forces that go beyond efficiency gains from reallocating resources according to comparative advantage. New trade theory considers trade productivity inks (i.e. "new growth theory"), imperfect competition, and rent-seeking behaviour, especially in considering the issues of regionalism versus multilateralism. Characteristics of new regionalism suggest that the welfare impacts cannot be fully explained using old trade theory. Features of new regionalism that have been prominent in recent literature include and known as dynamic effects of a RTA:

- technology and knowledge transfers, and technology diffusion, especially from developed countries to developing countries that increase productivity.

- dynamic comparative advantage and "learning by doing" efficiency gains through increased demand from expanded trade.

- elimination of wasteful rent seeking activities through trade liberalization.

- pro-competitive gains from increasing import competition in an environment of imperfect competition, allowing exploitation of potential economies of scale in production.

- increased geographical dispersion of production through trade that supports exploitation of different factor proportions for parts of the production process (Ricardian efficiency gains) and/or local economies of scale through finer specialization and division of labour in production (Smithian efficiency gains).

- increased foreign direct investment that carries with it advanced technologies and hence increase in productivity.

- "challenge response" increases in efficiency through increased competition due to expanded involvement in world markets, and

- Schumpeterian innovation and "creative destruction" induced by increased competition arising from expanded trade.

IV. RTAs and Global Liberalization

Bhagwati's (1990) characterization of regional trade agreements as "building blocs or stumbling blocs" for multilateralism is part of an ongoing debate on whether new regionalism helps or hurts prospects for continuing global liberalization. In addition to RTAs' static trade and welfare impacts, their effects on the multilateral negations then taking place in the Uruguay Round became an important criteria for evaluation the net benefits of an RTA. In Bhagwati and Panagariya (1996), building blocs were defined as RTAs that either prompt an acceleration in multilateral negations (by going further and faster than multilateralism, and creating successful experience with reform), or which add new members until the bloc converges on global free trade. Stumbling blocs are the opposite: they create or entrench trade diversion and protectionism, and are closed to expansion.

Krugman (1991) explains the incentive small countries have to form an RTA that lets them exert market power, as a group, and benefit from a higher external tariff. This analysis uses the old trade theory tools from Viner-Meade framework, particularly the terms of trade effects of an RTA on non-members. Krugman describes that when there are many small blocs, they will set low external tariffs due to their limited market power. As the number of blocs diminishes, they will seek their optimal tariffs high, tending to increase trade diversion relative to trade creation. When there is only one bloc, the world has achieved free trade on a multilateral basis, and trade diversion is eliminated.

V.   The Institutional Framework for Trade Liberalization

The General Agreement on Tariffs and Trade (GATT) has, long been the principal multilateral agreement governing international trade in goods. The original GATT of 1947 has been refined over time through a succession of "Rounds". The most important rounds are the Kennedy Round, which focused on the reduction on the reduction of tariffs, the Tokyo Round, which concentrated on non-tariff trade barriers and finally Uruguay Round which was concluded in 1994 and was an altogether more ambitious project in that it included agricultural goods, services, intellectual property rights and on a more limited scale, foreign direct investments, established a new permanent international entity, the World Trade Organization (WTO) and beefed up the dispute settlement process. On a regional basis, similar, but more limited efforts to promote free trade are also being made by trading blocs or trading groups such as free trade areas and custom unions.

VI.   The GATT Agreement in Brief

The Preamble of the General Agreement proposes to raise living standards by reducing the trade barriers and in particular, by eliminating discriminatory trade practices. Part I (article I- II) of the agreement states the basic principle of nondiscrimination and legally binds members to comply with their tariff concessions. Part II (article III-XXIII) calls for the elimination of non-tariff barriers, subject to several qualifications. Part III (articles XXIV-XXXIII) contains procedural rules, most

importantly condoning the formation of free trade areas. Part IV (articles XXXVI-XXXVIII), added in 1965, and addresses the special needs of the developing countries.

One of the most important article in GATT is article I- The Principle of Most Favoured Nations (MFN) which promote free trade and avoid non-discriminatory trade practices among members in GATT/WTO. This article states that a tariff on an imported product should be applied equally to all members.

VII. Regional Groupings

The major exception to the MFN principle is contained in Article XXIV, which allows for the establishment of free trade areas and custom unions. The major provisions governing such economic integration are that they should not increase tariffs or other barriers to trade with non-members among the GATT countries, and that they should cover (nearly) all trade between the members. Eight successive rounds of negotiations under GATT have resulted in significant global trade liberalization and there has been an accelerated trend toward regional integration in every part of the world. Most of the early attempts at regional trade agreements (RTAs) in the 1950's and 1960's, many of them among developing countries, met with success. This "first wave" of regionalism has been eclipsed by the exponential growth in the number of RTAs formed over the past 10 years. As of October 2003 more than 250 RTAs were in force (figure 2.2).

Figure 2.2   **Regional Trade Agreements in Force (Cumulative)**
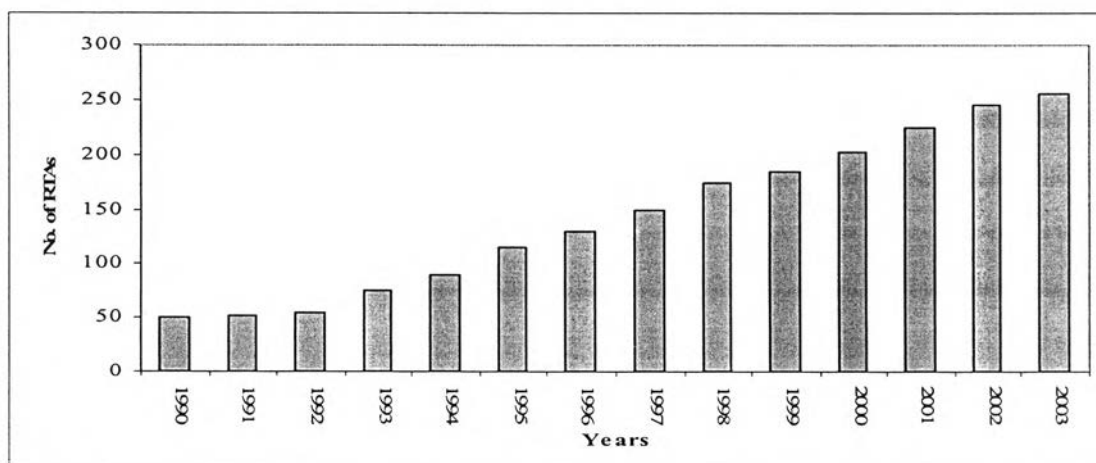
Source: WTO Website (www.wto.org)

Almost every WTO member has now joined at least one RTA and some have entered 20 or more. The most dramatic policy-driven exercise in regional integration has been the establishment of the European Common Market in 1958 and its evolution into the European Union (EU). WTO (2003) highlights that in the current wave of regional agreements, two broad trends are emerging. Many countries which traditionally relied on the multilateral trade regime are increasingly joining regional agreements to promote trade. A second important trend is that a number of continent-wide mega trade blocs like the Free Trade Area of the Americas (FTAA) or the Euro-Mediterranean FTA are under negotiation. Once these negotiations are finalized, a significant share of global trade flow will be diverted through these trade blocks.

GATT/WTO plays an important role in promoting global trade liberalization as free trade is believed to lead to an optimal, or at least an improved, allocation of scare resources through the international division of labour and consequently, to a member of economic benefits.

Numerous observers and analysts of RTAs, who are interested in enhancing their compatibility with the global trading system, propose that WTO disciplines be applied more stringently. Years of discussion in the GATT/WTO on the interpretation of existing criteria, and the many papers proposing more specific criteria have had no impact on the spread or content of RTAs. Improving the enforcement of Article XXIV or strengthening/changing WTO disciplines on regionalism is unlikely to fare any better.

The highest priority should be to ensure that the Doha Development Agenda is completed in a manner that provides new market access to exporters in developing countries. In addition to their interests in development, the large countries have an important historical and systemic responsibility to ensure that the world trading system remains as open as possible. Adopting the widest possible product coverage and greatest market access expansion would increase the development impact. Supporting open regionalism by encouraging partner countries to adopt low external barriers would create momentum toward integration with the world, establish a more efficient development path, and reduce the adverse negative implications of RTAs on nonmembers.

2.3   Methodology

The methodology of the study takes both qualitative and quantitative approaches. The study focuses on analyzing the impact of South Asian Free Trade Area (SAFTA) on Sri Lankan economy. Further, the study investigates the bilateral free trade agreements between Sri Lanka and India, proposed bilateral FTA between Sri Lanka and Bangladesh and other policy options on Sri Lankan economy.

2.3.1   Descriptive Method/Qualitative Method

The descriptive analysis investigates characteristics of South Asian counties and trends in trade investments and trade and investment policies in South Asia. Further, the salient features of RTAs in South Asia will also be illustrated. Moreover experiences of ASEAN economic integration will be presented to take as an example for SAARC to strengthen its future economic integration.

The objective of this analysis is to identify the characteristics of each SAARC country's economy and respective trade and investment policies to determine the causes for low intra trade level among the SAARC members to shed light in designing the quantitative analysis.

2.3.2   The Model

The study uses the data and the modeling framework given under the Global Trade Analysis Project (GTAP). GTAP is a multi regional Applied General Equilibrium model, which captures various aspects of world economic activity (Hertel: 1997). It is a comparative-static, model of the Johansen type comprising a system of equations in percentage change of variables. At present, multi-country computable general equilibrium (CGE) models provide the most appropriate tool for examining the impact of trade liberalization on world prices, trade, and static welfare impacts in traditional international trade theory. These empirical models have become a work-horse of policy analyses because of their capacity to capture bilateral trade flows, input-output relationships, factor market effects, price and quantity changes and welfare impacts- all within a framework that has a consistent foundation in microeconomic and trade theory.

Since, the main objective of the study is to assess the impact of SAFTA and other policy options on Sri Lankan economy a multi regional AGE model is an appropriate analytical tool to analyze the trade and welfare impacts of each of the policy outcome.

2.3.3   The Structure of the GTAP model

Each region in the global model is endowed with primary factors of production, land, capital, skilled and unskilled labour and natural resources. These non-labour 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. Labour is mobile across sectors only at the regional level. The modeling of each region in GTAP based on the ORANI model and further, it is based on the assumption of constant returns to scale.

Figure 2.3   **Overview of the Model**
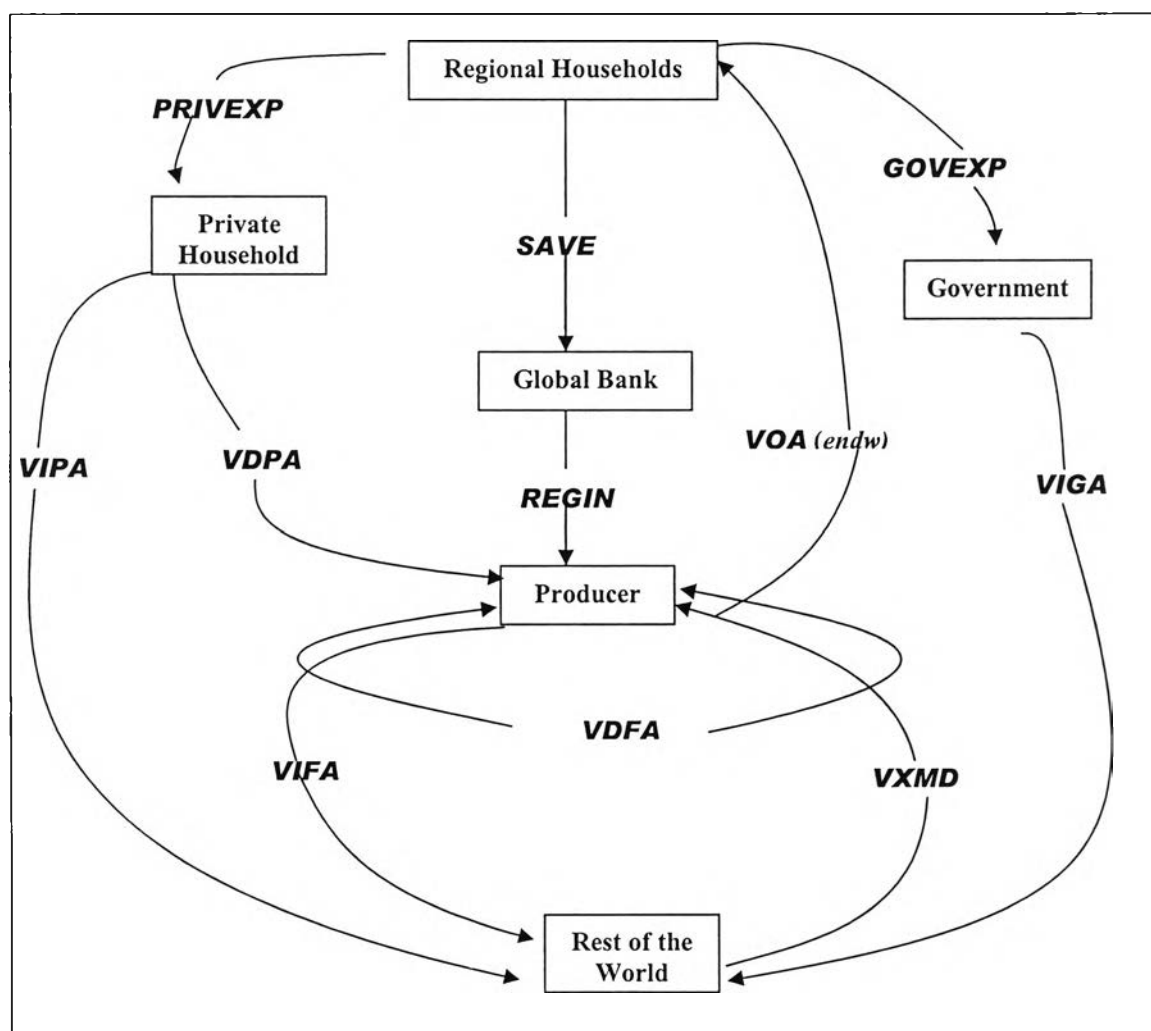
Source: Hertel: 1997

Where:

PRIVEXP = Private household Expenditure

GOVEXP = Government Expenditure

SAVE = Value of net Savings

VOA = Value of Output at Agent's Prices of endowment commodities

REGINV = Gross Investment in Region

VIPA = Import Payments from households

VDPA = Value of Domestic purchases by private house holds

VIGA = Value of Domestic purchases by Government

VIFA = Import payment from firms

VDFA = Value of domestic purchases by firms

VXMD = Value of exports at market price

A representative household in each trading country/region maximizes utility subject to a budget constraint, and producers maximize profit subject to technology constraints. Households buy both domestic and foreign goods and producers produce for both domestic and foreign markets. Both the utility of households and production by firms are described by standard CES functions (concave, monotonic, homothetic and continuous). Equilibrium conditions in each region and at a global level imply that markets for goods and capital clear, competitive firms earn zero economic profit, the income and expenditure of a representative household are equal and trade is balanced. Labour market clears at the country/regional level in the model. The multi-regional equilibrium model is closed by allowing quantities, prices and income to adjust at global as well as regional level until all excess demand functions are zero and equilibrium conditions are satisfied.

The capital inflow or outflow, if any, is allowed to clear any imbalance in international trade. Capital will flow into and out of regions until real returns are equalized across among all regions and sectors. The governments in each country/region are allowed to carry out their own fiscal and trade policies in order to enhance bilateral and multi-lateral trades. This model explicitly specifies interdependency in global markets. It is an appropriate framework for the evaluation of the effects of various trade and investment promoting measures being pursued by members of the trading community grouped in various trading blocks (Hartel (1997),

Perroni and Whalley (1996), Whalley and Hamilton (1996), Will and Winters (1996) for more discussion on global trade). The structure of the model can be presented as follows.

- Production in sector i in region r uses intermediate inputs, and labour and capital from its own region as well as from all other regions to produce their output according to Leontief production technology as following:

$$Y_{i,r} = \min\left(\frac{INT_{j,i,r}}{a_{i,j,r}}, \left(K_{i,r}^{\beta_r} L_{i,r}^{1-\beta_r}\right)\right)$$

Where:

$Y_{i,r}$ = Output of the sector i good in region r,

$K_{i,r}$ = Capital services originating in region r but used to produce the good i in region r,

$L_{i\,r}$ = Labour services originating in region r but used to produce the sector i good in region r,

$INT_{j,i,\,r}$ = An intermediate input originating in sector j of region r but used to produce the sector i good in region r,

$a_{j,i,r}$ = A coefficient that gives the amount of the sector j intermediate input of region r used to produce the sector i good in region r,

β_r = The share of capital income in sectoral output in region r.

Land and natural resources are additional inputs in case of agriculture sector.

- The output of good i for a particular region r, is represented by the below function.

$$Y_{i,r} = \left(\delta_{i,r} YD_{i,r}^{\eta_{i,r}} + (1-\delta_{i,r}) X_{i,r}^{\eta_{i,r}}\right)^{\frac{1}{\eta_{i,r}}}$$

Where:

$Y_{i,r}$ = The output either supplied to the home region or exported to other regions.

$YD_{i,r}$ =Domestic sales of output of good i in region r,

$X_{i,r}$ =Exports of good i from a region r,

$\delta_{i,r}$ =The share of domestic sales of gross output

$\eta_{i,r}$ =The elasticity of transformation between domestic sales and exports.

- A total domestic supply comes from domestic sales plus imports. Thus absorption of region, r is given by a CES aggregation of imports and domestic supplies is given by the below equation.

$$A_{i,r} = \left(\mu_{i,r}YD_{i,r}^{\sigma_{i,r}} + (1-\mu_{i,r})M_{i,r}^{\sigma_{i,r}}\right)^{\frac{1}{\sigma_{i,r}}}$$

Where:

$A_{i,r}$ = Armington aggregation (imports are sourced from all regions, with their share depending on trade prices) of domestic and imported goods

$\sigma_{i,r}$ = The elasticity of substitution between imported and domestic products

$\mu_{i,r}$ = The share of domestic production in the Armington product

$M_{i,r}$ = Imports of good i to region r. The value of imports of goods into regions r are equal to value of exports of other region to that region plus transportation costs from the origin to the destination.

- Transportation services are proportional to trade:

$$T_{i,r,s} = \tau_{i,r,s}M_{i,r,s}$$

Where:

$T_{i,r,s}$ =Transportation services

$\tau_{i,r,s}$ = Transport cost per unit of traded goods

$M_{i,r,s}$ = Amount of good i traded from region r to s.

These international transport services are produced using transport goods supplied by each region.

- For simplicity, the utility function in each country/region is presented by a CES or Cobb-Douglas aggregation of final consumption goods supplied by each country/region. The total domestic demand is divided between household and government consumption. Household consumption is a Cobb-Douglas aggregation of sector i commodities over all r countries/regions. This is illustrates in the below equation.

$$U_r = \prod_{i,r} C_{i,r}^{\gamma}$$

- Households receive factor income from all countries/regions and transfers from their own government. The income of the representative household in each region is presented by the below equation.

$$I_r = \sum_i w_r L_{i,r} + \sum_r r_r K_{i,r} + RV_r$$

Where:

I_r : Income

w_r : Wage rate

r_r : The interest rate

RV_r : The transfer received by a representative household in region r.

- Government consumption demand reflects a Cobb-Douglas aggregate of all sector i commodities over all r regions.

$$G_r = \prod_{i,r} GD_{i,r}^\gamma$$

Where:

$GD_{i,r}^g$: The government consumption of good i in region r.

- The government in each region collects taxes from factors income, intermediate inputs, imports and domestic sales.

$$G_r = \tau_k r_r \overline{K}_r + \tau_w w_r \overline{L}_r + \tau_{i,r} P_{i,r} Y_{i,r} + \tau_{N,r} P_{i,r} INT_{j,i,r}$$

Where:

G_r : Total government revenue

$t_{k,r}$: Tax rate on capital income

$t_{w,r}$: Tax rate on labour income

$t_{w,r}$: Tax rate in wage income

$t_{i,r}$: Tax rate on intermediate income

$t_{N,r}$: Tax rate on intermediate input.

A competitive equilibrium in this global economy is such that, given the prices of commodities and factors, demands for good and supply of goods are equal at the regional as well as the global level; factor market clears for each region and at the world level; consumers of each region maximize their utility subject to their income constraints; and the government budget and trade are balanced for each region.

In this GTAP model a competitive equilibrium is given by prices of consumption goods, $P_{i,r}$; the prices of capital r_r; a wage rate for labour, w_r levels of gross output, $Y_{i,r}$; capital use, $K_{i,r}$; sectoral use of labour, $L_{i,r}$; and income I_r such that, given these prices and quantities:

i)   households in each region maximize utility subject to their budget constraints;

ii) firms in each region maximize profits subject to technology constraints;

iii) labour market clears at the country/regional level;

iv) the markets for goods and services and capital clear in each region and at the global level;

v)   the government budget constraint is satisfied for each region, and

vi) the trade-balance condition is satisfied at the regional and global level.

- More specifically, the market clearing condition for the goods market is given by:

$$Y_{i,r} = \sum_r C_{i,r} + \sum_{rr,j} a_{i,j,r} INT_{i,j,r}$$

- The global capital market clearing condition implies:

$$\sum_r \bar{K}_r = \sum_{i,r} K_{r,ri}$$

- Labour market clears at the country/regional level:

$$LS_r = \sum_i LS_{i,r}$$

When there are $r.n$ different markets in the economy, relative prices that clear rn-1 markets also clear the rnth market as well (Walras (1954)).

2.3.4   Country/Region and Industry Aggregation Strategy

The GTAP version 6 (Database 2001) covers all bilateral trade, transport and protection data that link 87 country/regional databases and it represents the world economy in 2001. This version consists of 87 regions, 57 industries, and 5 factors of production. Therefore, it is important to select the regions/countries and the industries to be analyzed in the study. In deciding the region and commodity aggregation strategy it is important to understand the export and import structure of the country and major trading partners of Sri Lanka.

According to the figures 1.5 and 1.6 depicted in section 1.3.1 it is could be seen that major export item of Sri Lanka is textile and garments which accounts for 50% of the total export. On the other hand major import items are intermediate inputs and textiles, which accounts 25% and 22% respectively. The 57 industries in GTAP database are aggregated into 27 industries/commodities (Table A.2 in Appendix). The main objective of this strategy is to keep the major traded commodities of Sri Lanka (both in the case of intra-SAARC trade and trade with rest of the world) separate and aggregate the rest. However, the product items considered under SAFTA and other bilateral free trade agreements are very narrowly defined at 6-digit HS code level and it is difficult to aggregate them in a sensible way according to the GTAP commodity classification. The results will be interpreted on the industries classified in GTAP model.

From the figure 1.8 illustrated in section 1.3.2 it can be identified that USA is the largest single destination for Sri Lanka's exports during the year 2003. The European Union (EU), dominated by the United Kingdom, was the second largest destination of Sri Lanka's exports

When analyzing the importing trade partners, India became the largest single exporter to Sri Lanka followed by Hong Kong, Singapore, South Korea, Malaysia and China.

Since the main objective of the study is to investigate the impact of the SAFTA and other policy options on Sri Lanka as a member of the South Asian region, all SAARC regions have been separated as much as possible (Bangladesh, India, Sri Lanka and Rest of South Asia). The GTAP database (version 6) does not have separate data on Pakistan, Nepal, Bhutan and Maldives. They are considered jointly as the Rest of South Asia. The other countries/regions distinguished are USA (Sri Lanka's main export destination), Japan, Association of South East Asian Nations (ASEAN), China, European Union (EU), High Income Asia and Middle East (Figure 1.8 in section 1.3.2). These countries/regions are separated, as they are Sri Lanka's major trading partners and therefore, have significant trade relationship with these regions and countries. Other countries/regions are combined as Rest of the World. For policy analysis purpose 87 countries/regions in GTAP version 6 are aggregated into 15 countries/regions (Table A.1 in Appendix).

2.3.5   Simulation Design

In this study, five simulations are performed one is for the SAFTA and rest contains different bilateral FTAs between Sri Lanka and the other SAARC member countries and other policy options. Simulation 1 considers full implementation of the SAFTA in its originally proposed form. Simulation 2 considers the South Asian Customs Union situation, as the SAFTA is aiming to transform into customs union in future. The aim here is to take into account of tariff liberalization rules of the world trade organization (WTO). For simplicity of this study purpose 15% common external tariff reduction on the other regions and rest of the world has been considered. Though it is not 15% for all the commodities, this was chosen arbitrarily. Simulation 3 and 4 considers bilateral FTAs between Sri Lanka and the other SAARC member countries. In all simulations non-tariff barriers are assumed to be absent. In addition it is assumed that aggregate employment of labour and land are fixed in each country/region. Simulation 5 has been considered to show what happens in complete free trade situation in the world.

► **Simulation 1   : Preferential Trade Liberalization in South Asia –SAFTA**

All SAARC countries reduce their existing tariff rates to 5%. If the existing tariff rates are less than 5% it will remain unchanged.

► **Simulation 2   : South Asian Custom Union**

SAFTA plus 15% uniform external tariff rate to other regions and to the rest of the world.

► **Simulation 3   : Indo-Lanka Free Trade Agreement (ILFTA)**

Under ILFTA both India and Sri Lanka have negative lists to safeguard their domestic industries. The tariff concessions are not applied to the products on these negative lists (Details of ILFTA will be discussed in Chapter 3, section 3.4.2). Therefore, an attempt will be made to incorporate the impact of having "negative list" on welfare of the Sri Lankan economy. To make a comparison between free trade situation and partial free trade situation this simulation will be performed under two scenarios as follows:

a)   **Indo-Lanka Full Free Trade Liberalization Scenario**

In this situation tariff will be reduced to zero on all products traded between two countries.

b)   **Indo- Lanka FTA   (with negative list)**

Under this situation no tariff reduction will be made on the product categories included in the negative lists of Sri Lanka and India and tariff will be reduced to zero on the duty free items and on other items in the positive list tariff reductions have been designed on reciprocal basis in accordance with Indo Lanka FTA. The tariff reduction on this simulation is depicted in table A.3 in Appendix.

► **Simulation 4 : Proposed Sri Lanka-Bangladesh Free Trade Agreement**

In this situation Sri Lanka-Bangladesh full free trade situation will be considered.

► **Simulation 5   : Multilateral Trade Liberalization**

Each of the countries in the study cut its tariff rates by 100% to all other countries in the world.

2.3.6   Welfare Effects

When a country participates in a free trade agreement, it may experience gains due to trade creation and loss due to trade diversion. The former has a positive effect on welfare, since the removal of tariffs within the region allows the country to allocate its resources more efficiently in production. The country is now able to import the goods that it formerly produced inefficiently behind its tariff wall from member regions that are more efficient producers (Caves and Jones 1981).

A significant part of the economic literature deals with the issue of defining the good measure of economic welfare. Most frequently used indicators are real wages, real GDP, real income, consumer surplus as well as the Hicksian Compensating Variation (CV) and Equivalent Variation (EV) measures.

In particular, changes in real wages are often used to measure welfare changes but, as demonstrated by Robinson and Thierfelder (1999) a problem arises when analyzing the impact of changes in taxes in the presence of many distortions/taxes. For instance, a policy reform with increases of indirect taxes and decreases of direct taxes may reduce real wages while being revenue neutral and without any effects on aggregate absorption and hence on agent well-being. Because policy reforms are always contemplated in a second-best world, change in real wages alone not enough to quantify welfare impacts.

In a similar vein, changes of real GDP are often reported in country comparisons but Kohli (2004) demonstrates that this welfare indicator may be in fact misleading as it underestimates the increase of real domestic income and welfare when one country experiences some terms of trade improvements. Real GDP focuses only on production possibilities and thus is unable to capture the beneficial effect for an economy of an improvement in its terms of trade (say a decrease of import prices). Because policy reforms may translate into terms of trade changes, therefore, the real GDP is not only indicator to measure welfare impacts.

In this research, we adopt the (EV) following the McDougall (2001) as our main objective is to explain the welfare effects which are simulated using Computable General Equilibrium (CGE) models. Once one particular welfare measure has been adopted, the critical challenges are to analyze the welfare impacts of policy changes as well as to define optimal policies. These challenges may be much simplified if it would be possible to identify and quantify the sources of welfare and their respective contributions with respect to a given policy scenario.

- **Equivalent Variation (EV) in the GTAP Model**

The regional household equivalent variation, resulting from a policy shock, is equal to the difference between the expenditure required to obtain the new level of utility at initial prices and the initial expenditure. In an economy with one household, a vector of goods, x, and income, m. The function that gives us the maximum utility achievable at given prices, p, and income m is called the indirect utility function:

$$v(p,m) = u(x)$$

$$s.t. px = m \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$

The minimum expenditure necessary to reach utility $v(p,m)$ is m:

$$e(p; v(p,m)) = m$$

$$s.t. px = m \dotfill (2)$$

Considering two policy regimes, for example, the status quo, with prices p⁰ and income m⁰, and the policy shock, with prices p¹ and income m¹. The equivalent variation is equal to:

$$EV = \mu(p^0; p^1, m^1) - \mu(p^0; p^0, m^0) = \mu(p^0, p^1, m^1) - m^0 \dotfill (3)$$

Where $\mu(q; p, m)$, called *money metric indirect utility function*, measures how much income the consumer would need at prices q to be as well off he would be facing price p and having income m, it is also defined as $e(q, v(p,m))$. If only the price of one good changes (for example, the price of good x₁ as in figure 2.4, decreases) and the income is fixed at m, the above equation for EV can be written as:

$$EV = \mu(p^0; p, m^1) - m = e(p^0, u^1) - e(p^0, u^0) \dotfill (4)$$

Thus, the equivalent variation uses the current prices as the base and asks what income change at the current prices would be equivalent to the proposed change in terms of its impact on utility.

Figure 2.4   **Equivalent Variation**
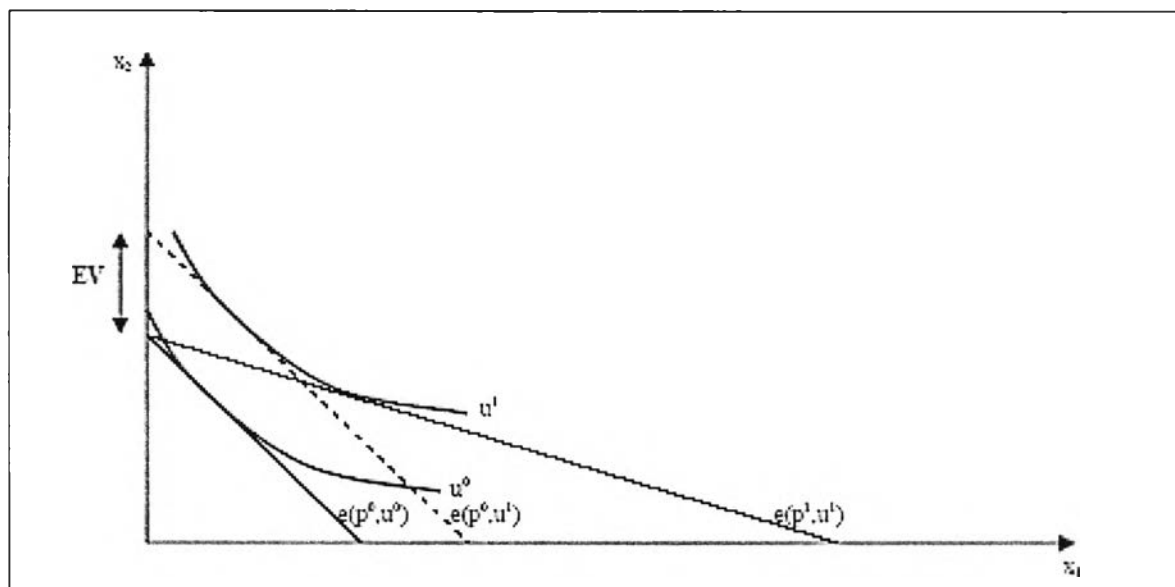
Source: Methods for Decomposing Welfare Changes in the GTAP Model, McDougall: 2001

The analysis of EV developed above can be extended to a multi-country and multi-sector model, such as the GTAP model. In fact, McDougall (2001) obtained the EV associated with a perturbation to the GTAP model as follows:

The regional household's EV is equal to the difference between the expenditure required to obtain the new (post simulation) level of utility at initial prices (Y_{EV}) and that available initially ($\overline{Y}$)

$$EV = Y_{EV} - \overline{Y} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(5)$$

Where Y_{EV} is the expenditure required to obtain the new level of utility at initial prices, that is equal to $\mu\left(p^0; p^1, m^1\right)$ in the above equation 3, whereas $\overline{Y}$ is the initial expenditure, that is, m^0 in equation 3.

Differentiating (5) we obtain:

$$dEV = 0.01 Y_{EV} y_{EV} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(6)$$

Where y_{EV} is the percentage change in Y_{EV} required to achieve the current actual utility level, in which the prices are fixed.

- **Decomposition of the equivalent variation**

a) Changes in allocative efficiency

Allocative efficiency refers to the efficient sector-wise allocation of scarce resources to produce the optimal combination of output. In open economy context it also refers to efficiency in resource use in purchasing imported products. In addition, percentage change in real GDP under each simulation will also be presented.

b) Changes in country's terms of trade (TOT)

The Terms of trade are defined as the ratio of the price received for tradables (export price index) to the price paid for tradable (import price index). McDougall (1993) explains that in a model like GTAP, which differentiates product by country of origin, changes in terms of trade can rise from changes in relative prices of different source specific varieties of the same commodity. A region's term of trade will tend to improve if its price of exports of commodities rises relative to the exports of other

regions. A region's terms of trade will worsen if it imports source specific varieties that rise in price relative to the other sources of the good.

c) Changes in prices of investment goods and savings (I-S effect)

I-S effect indicates that how much investment takes place in each economy during the period of tariff reductions to make sure that sum of regional investment matches with the changes in global savings.

2.3.7   Limitations of the GTAP Model

The standard GTAP model is a static model which cannot capture the dynamic effects from trade liberalization such as the benefits of increased competition, potential economies of scale, and the incentives for investment brought about by a preferential trading agreement, technology and productivity change which will be fully realized only in the long run. One of the limitation of the model is failure to link government expenditure to tax revenues. Cutting taxes by no means implies a reduction in government expenditure in the GTAP model.

However, GTAP is a useful tool for generating comparative static results for a variety of trade reform scenarios, the comparison of which can provide direction in the path toward further trade reform.

2.3.8   Measurement of Variables and Source of Data

The variables used for the analysis are of welfare change under the given simulation is the equivalent variation of the regional integration. This can be accomplished by implementing a decomposition of the equivalent variation (EV) welfare measure currently employed in the GTAP model. The decomposition of equivalent variation and their definitions have been presented in section 2.3.6.

The study uses the data in the input/output tables in GTAP version 6 database, which represents the data for 2001 world economy. The global trade model presented above required data on output, imports, exports, consumption and government demand, employment of labour and capital, intermediate inputs, and base year prices for each

sector and region included in the model. It also needs tax and tariff rates for each product.

Firstly, the situation prior to implementation of the trade liberalization scenario will be presented (pre simulation results) and subsequently, the results under each simulation will be presented (post simulation results) to make comparison of change in input/out put tables before and after liberalization.

2.4 Summary

In this chapter an attempt has been made to review the empirical studies and theoretical background to the economic integration. In reviewing the empirical studies it was revealed that divergent views about the possible impacts of formation of the SAFTA. Even the researchers used similar model the results may vary. However, the majority of the empirical research findings indicated that multilateral trade liberalization is the best outcome for all member countries. Moreover, general equilibrium modeling is comparatively rare in the South Asian region.

The structure and the overview of the GTAP model have been presented to get an insight into the simulation design and interpretation of the results. The decomposition of the equivalent variation that arises as a result of trade liberalization was depicted to determine the welfare implication of each of the policy option. Finally, the limitations of the GTAP model were presented which should be taken into account in interpreting the results of the simulation analysis.