An Econometric Analysis of India-Sri Lanka Free Trade Agreement

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Abstract

This paper investigates whether the India-Sri Lanka Free Trade Agreement (ISLFTA) has had trade creation or trade diversion effects on the rest of the World. The method used resembles the one used by Romalis (2005) to study NAFTA. In order to use the variations in tariff at the product level, we use six digit HS classification of products. We construct seven panel data sets for the period 1996 to 2006. We use the commodity and time variation in the tariff preferences allowed under ISLFTA, to identify its effect on sourcing of different products from 'control country' to ISLFTA region. Using fixed effects model we find that the ISLFTA has been minimally trade creating for control countries.

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Keywords: Free trade agreement, tariffs, trade creation.
JEL classification: F10, F13, F15

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1 Introduction

The growth of regional trade blocs has been one of the major developments in international relations in recent years. During the 1990s, regionalism was conceived as a developmental option in itself that would promote competitiveness of trade bloc members and help their fast integration into the international economy. As per the World Bank report on 'Global Economic Prospects' (2005) the number of the Regional Trade Agreements (RTAs) has more than quadrupled since 1990 rising to around 230 by late 2004 and the trade between RTA partners now constitutes nearly 40% of total global trade. Quoting, World Trade Organisation (WTO) this report estimates another 60 agreements at various stages of negotiations. The World Bank report points out that the boom in Regional Trade Agreements (RTAs) reflects changes in certain countries' trade policy objectives, the changing perceptions of the multilateral liberalization process, and the reintegration into the global economy of countries in transition from socialism.

Regional agreements vary widely, but all have the objective of reducing barriers to trade between member countries—which implies discrimination against trade with other countries. At their simplest, these agreements merely remove tariffs on intra bloc trade in goods, but many go beyond that to cover non-tariff barriers and to extend liberalization to investment and other policies. At their deepest, they have the goal of economic union and involve the construction of shared executive, judicial, and legislative institutions. Many factors, some explicitly stated and others not so publicly admitted, have been responsible for the recent spurt in regionalism. The desire to put the multilateral system into faster and deeper action in selected areas by creating more powerful blocs that would operate within the GATT/WTO system[2] and the fear of being left out while the rest of the world swept into regionalism, the domino effect are often cited as the major reason for the growth of RTAs. After China's entry into WTO , the

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[2] Article XXIV of the GATT, 1994 imposes three basic obligations on WTO members wishing to enter into a Free Trade Agreement (FTA) covering trade in goods--- i) An obligation to notify the FTA to the WTO; ii) An obligation not to raise the overall level of protection and make access of products of third parties not participating in the FTA more onerous (the so-called external trade requirement); and iii) An obligation to liberalize substantially all the trade among constituents of the FTA (the so-called internal trade requirement).

East Asia has experienced a massive domino effect with dozens of new RTAs being announced, negotiated and signed (Baldwin 2006). The growth of Free Trade Agreements (FTAs) in Asia as estimated by Asian Development Bank (ADB) is shown Figure 1.

Political considerations also features in decisions to establish RTAs, especially when governments seek to consolidate peace and increase regional security as well as to acquire greater bargaining power in multilateral negotiations by first tying in partner countries through regional commitments.

There has been considerable debate in academic circles about the impact of RTAs on the member countries and on the rest of the world (Bhagwati and Krueger; Krueger 1997). One view for RTAs has been that they improve resource allocation within a region and improve income for member countries by reducing the trade barriers. Consumers are better off as they can buy the goods form the most efficient supplier at the lowest cost. This is so called trade creation effect for the members. On other hand, the arguments are given that by its nature, an RTA is discriminatory for the non-members and members gain at the expanse of the non-members, resulting into trade diversion. In general an RTA would lead to some amount of both trade creation and trade diversion effects (Krueger 1997). If the trade diversion is sufficiently large relative to the trade creation effects, the RTA could conceivably end up being harmful to the member countries.

In this research paper, we empirically analyze the "India-Sri Lanka Free Trade Agreement" (ISLFTA) to find out the trade creation or diversion effects of ISLFTA on rest of the world. We use the detailed trade data (HS 6 digit level) to study the trade effects under ISLFTA. The reason for choosing this FTA is that it is one of the few South-South Agreements that is working credibly and could be an example for other South-South Agreements to emulate. Holmes (2005) for example, also found that India Sri Lanka FTA is an effective Regional Trade Agreements and one of few effective South-South Agreements. Using gravity model she tested 122 FTAs and found that only 46% of FTAs (including ISLFTA) were effectively implemented, in the sense that they

positively and significantly increased the trade flows between member countries. The success of ISLFTA has proved that if the concerns of smaller economy are taken into account with more favorable treatment then the size differential in the economies of the FTA partners do not matter. Being the first of its kind in the South Asian region, it has invited lot of interest among the exporters of the region.

This paper is organized as follows: Section 2 gives a brief outline of ISLFTA , using trade flows makes an assessment about the effectiveness of this Agreement, Section 3 presents Literature Review, Section 4 discusses the Methodology used for analysis of ISLFTA, Section 5 gives a brief outline of the theoretical model, Section 6 describes the data sources and limitations of data, Section 7 covers econometric issues and discusses the results, and finally, Section 8 concludes the paper summarizing the major finding of this study.

2 Assessment of Trade under the ISLFTA

The India Sri Lanka FTA was signed in 1998 and became operational in March 2000. Mutual phased tariff concessions on different products on 6 digit Harmonised Classification[3] (HS Code) basis have been granted by both the partners. Each side is having its negative lists[4] (no concessions), positive list (immediate full concessions) and a residual list[5] (phased tariff reductions) as per the framework of ISLFTA. The preferential trade under the FTA is governed by Rules of Origin[6], which specify the

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[3] The Harmonised Commodity Description and Coding System, commonly referred to as the 'Harmonised System' or HS, is an international commodity classification system developed under the auspices of the Brussels-based Customs Cooperation Council (CCC), known today as the World Customs Organization (WCO). The Harmonised System consists of 21 sections covering 99 Chapters, 1,241 headings and over 5,000 commodity groups.

[4] Items, which are considered sensitive to the domestic industry by each partner to FTA, are included in the respective negative list. The items in negative list of Sri Lanka are not entitled for any duty concessions for imports from India. The same rule applies in case of India's negative list for Sri Lankan products.

[5] The positive list and residual list are considered less sensitive to domestic interests by each partner and are included in the phased reduction of tariffs by both sides. All the three lists in respect of India and Sri Lanka are available on Sri Lanka's Department of Commerce website. http://www.doc.gov.lk/web/indusrilanka_freetrade.php.

[6] The customs duties applied to imported goods may differ depending on the country from which the goods were exported. Most industrial products, available on the market today, are produced in more than one country. For example, in the case of cotton shirts, it is possible that the cotton used in their production is manufactured in country A, the textile woven, dyed and printed in country B, the cloth cut

criteria for a product to qualify for tariff concessions from the importing member. A comparison of India's (Sri Lanka's) average applied MFN tariff[7] with its preferential tariffs for Sri Lanka (India) is shown graphically in Figure 2 (Figure 3). More details about the commitment of FTA partners can be referred at Annex I .

After signing of ISLFTA, trade between India and Sri Lanka has increased manifold. India's import from Sri Lanka was US$ 45 million (0.10% of total imports) in 1999, which increased to US$ 499 million (0.29%) in 2006; India's export to Sri Lanka was US$ 482 million (1.4% of total exports), which became US$ 2110 (1.74%) in 2006. Similarly, Sri Lanka's import form India in 1998 was 538 million (9.49%), which increased to US$ 1804 million (18.46% rank 1) in 2006. Sri Lanka's exports to India has grown from US$ 35 million (0.75%) in 1998 to US$ 490 million (7.26%, rank 3) in the year 2006. In this way India became the major trading partner for Sri Lanka after the signing of the Agreement. Figure 4 (Figure 5) compares the growth of India's (Sri Lanka's) imports from Sri Lanka (India) with the growth of India's (Sri Lanka's) imports form the rest of the World since 1996. Comparing Sri Lanka's performance in two of its major export destinations (India and China), Figure 6 shows that Sri Lanka's share in India's total imports have been on rise after 2000. On the other hand, Sri Lanka's share in China's total imports remained almost constant. Figure 7 further shows share of some major exporters to India's total imports. Although exports from US, EU and other countries (except China) to India's have declined during 1996 to 2006, the share of Sri Lanka in Indian imports has increased consistently from 2000 to 2005.

The number of Sri Lanka's export items to India increased from 505 in 1996 to 1,062 in 2006 items on 6 digits of HS classification. There is a visible shift in Sri Lanka's exports from agricultural products[8] to manufacturing goods[9]. The major products

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and stitched in country C and the shirts are packed for retail in country D before being exported to country E. Article VII together with Annex C of the India Sri Lanka FTA specify the rules of origin for the preferential treatment of goods by partner countries. Rules of origin criteria are crucial to ensure that preferential tariffs are not used to route the non-FTA country products to the Free Trade Area.

[7] The MFN principle is a principle of non-discrimination; it is a legal obligation under Article I of GATT to accord equal treatment to all other WTO members of a concession (here tariff) given to any trading partner by a member of WTO.

[8] Agricultural products are defined under Annex 1 of the WTO Agreement on Agriculture.

exported by Sri Lanka to India in 2006 included – Fats and Oils (22.3%), Copper and Articles of Copper (8.6%), Electrical Machinery (8.6%) and Spices, Coffee, Tea (6.2%). Similarly, India exported Mineral Fuel, Oil (22.44%), Vehicles (18.08%), Iron and Steel (4.54%), Machinery, Reactors, Boilers (4.22%) and Pharmaceutical Products (4.13%) to Sri Lanka.

Figure 8 shows share of Sri Lankan products in India's total imports. It also shows Sri Lanka's share in India's imports in items under three lists- negative, residual and positive lists. As mentioned before, there has been an increase in total share of import of Sri Lankan goods from 0.10% in 1999 to 0.29% in 2006. The import from Sri Lanka has also increased in the items on the residual list from 0.2% in 1996 to 0.47% in 2006. It is noteworthy that there has been an increase in the imports even in the negative list items from 0.5% in 2001 to 1.19 % in 2006. This could be mainly due to the increased awareness to partners' market, smoothening of customs issues and improved access to ports of entry due to the increased engagement of partner countries on products having preferential tariffs on residual list, the so called 'border effects' .

However, the trade flows in the positive list items is relatively stagnant. This could be attributed to the fact that during ISLFTA negotiations, the immediate concessions were allowed by India on the products on which Sri Lanka does not have a comparative advantage. Same could be said about the items on Sri Lanka's positive list. This is a good strategy by both the countries to prepare their domestic industry for smooth adjustments due to FTA and make ISLFTA a workable agreement.

All the above facts clearly show a marked increase in trade flows between India and Sri Lanka after implementation of ISLFTA in 2000. Trade creation between members and new products entering Indian market from Sri Lanka is evident after ISLFTA. But we remind the reader that in this study, we will be limiting our econometric analysis to find trade creation or trade diversion effects of ISLFTA on rest of the world.

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[9] Products other than agricultural products can be categorized as manufactured or non-agricultural products. The product classification under non-agricultural products is still being discussed at Non Agricultural Market Access (NAMA) negotiations at WTO.

3   Literature Review

Despite its importance in the South Asian region, not many empirical studies have been conducted to access the impact of ISLFTA. We know only one study, which has attempted to analyses the performance of this FTA by Mukerji and Kelegama (2007). Their study is based on the bilateral trade flows under different categories of products. Sector wise imports and exports figures are compared before and after the FTA. They have concluded that the two countries have displayed political will to forge ahead towards economic integration and the considerable size disparity between the two economies does not hinder bilateral free trade when appropriate special and differential treatment is accorded to the smaller country. Some new goods from Sri Lanka have found entry into the Indian market following the exchange of preferences. Finally, they have concluded that the economic benefits of free trade can and do override political problems. In the previous version of their study Mukerji, Kelegama and Jayawarhana (2004), they have found modest increase in trade in case of overall Indian imports from Sri Lanka, but considerable trade increase in case of Sri Lankan imports from India.

Another report on evaluating economic performance of the FTA is 'Joint Study Group on India –Sri Lanka Comprehensive Economic Partnership Agreement' constituted by the partner Governments (JSG report, 2003)[10]. JSG (2003) has concluded that ISLFTA promoted a 48% increase in bilateral trade between 2001 and 2002, and at present India is the largest source of imports into Sri Lanka, accounting for 14% of Sri Lanka's global imports. India is the fifth largest export destination for Sri Lankan goods accounting for 3.6% of Sri Lanka's global exports. Based on the success of ISLFTA, the JSG has recommended that the two countries enter into a Comprehensive Economic Partnership Agreement (CEPA) covering trade in services and investment and to build upon the ISLFTA by deepening and widening the coverage and binding of trade in goods.

Most of the sophisticated econometric analysis of FTA has been on NAFTA. In order to decide about our methodology for this study, we surveyed studies conducted in the

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[10] JSG (2003) can be found at
http://www.ips.lk/news/newsarchive/2003/20102003_islcepa_final/islcepa.pdf#search='India%20Sri%20Lanka%20Trade%20Study'

context of NAFTA, as we could draw a parallel to the NAFTA's trade analysis for our research. Most of these studies have examined aggregate imports and exports, but there are only few studies focusing on disaggregate trade data.

For example, Gould (1998) adopted a gravity model to find the impact of NAFTA on North American trade. Using aggregate quarterly trade flows in log first differences, he concluded that NAFTA may have stimulated the growth of US aggregate exports to Mexico but not US imports from Mexico. Gould (1998) also finds no trade diversion. In another gravity based approach, Soloaga and Winters (2001) find no distinguishable evidence of trade diversion on non-members of NAFTA. Similarly, Krueger (1999, 2000), also adopted a gravity model approach and finds no evidence of trade diversion from the rest of the world after NAFTA came into operation. She finds that events other than NAFTA, such as Mexico's real exchange rate and its trade liberalization process, appear to have dominated the pattern of trade. Fukao, Okubo and Stern (2003) focused on disaggregated level (2 digit) for selected manufactured goods , using a version of the gravity model developed for the percentage of imports from a country to US total imports of an industry. Out of 60 sectors examined, they find evidence of trade diversion in the textile and apparel sector, where Mexican exports have replaced lower-cost Asian exports. This is in agreement with the findings of USITC (2003) study that also found evidence of trade diversion in one sector (apparel) out of 68 sectors analyzed.

The most ambitious study of NAFTA on highly disaggregated (HS 6 digit) is by Romalis (2005). This study is based on the estimation of effects of FTA on trade volumes and prices. It identifies demand elasticities by developing a difference in differences based method that exploits the variation across commodities and time in the US tariff preference given to goods produced in other NAFTA countries. It also identifies the supply elasticities by using tariffs as instruments for observed quantities. With the estimates of demand and supply elasticities, he estimates the change in welfare and trade due to NAFTA. He finds that 25-30% of the rise in Mexican exports to US since 1993 is due to Mexico's improved preferential treatment, implying substantial trade diversion. The welfare analysis of Trade Volumes is followed by Econometric

Confirmation of Trade Diversion and its role in reducing the static welfare gains. Romalis (2005) develops a log difference equation of value of exports of commodity z from a non-NAFTA country (control country c') to North America (country 1) and to the EU (country 2), grossed up for transport costs and tariffs. He regresses the log-difference between 'country 1' and 'country 2' imports from control country c' on preferential and MFN tariffs to estimate the trade diversion/creation.

4 Methodology for Analysis of ISLFTA

To find the trade creation or trade diversion effects of the India- Sri Lanka Free Trade Agreement (ISLFTA) on rest of the World, we follow a slightly modified methodology adopted by Romalis (2005)[11]. Ideally, we should also estimate the demand and supply elasticities for our key countries, for which we will need item-wise data on domestic production and consumption of goods. But Governments in India or Sri Lanka do not maintain such data on six digit HS, so we are unable to estimate these two parameters for our study.

In order to use the variations in tariff at the product level like Romalis, we use 6 digit of HS 1996 product classification in our analysis. We choose India and Sri Lanka, (the ISLFTA partners --'country 1')[12] as our key countries. We first choose China as 'country 2' and 165 countries grouped together as control country c' (Annex II, Table A) to estimate the Trade Diversion/Creation due to ISLFTA. The choice of China as 'country 2' to identify trade diversion is of minor significance to the empirical analysis. China was chosen for two main reasons. Firstly, its detailed trade data has been available electronically. Secondly, China is having significant trade with for both of our key countries. The choice of China is further due to the reason that, it has substantial trade with most of the control countries c' (Annex II Table A) but it does not have any substantial change in preferential trade relations with these countries during the study period (1996-2006). Control countries are the countries form the rest of the world, who have not changed their preferential trade relations substantially with either ISLFTA

[11] Romalis J. (2005), "NAFTA's and CUSFTA's Impact on International Trade", NBER WP11059, Cambridge.
[12] In this study, we will use the word country to mean often a group of countries. For example, India and Sri Lanka together are referred as 'country 1' and Annex Table A to E countries as control country c'.

partners or China during 1996 to 2006. We selected the control countries from the list of 180 countries supplying data to COMTRADE during the study period. We dropped from this list the countries having special trade relationship with China during the study period--- Hong Kong, Macau and 10 ASEAN countries (Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam). Again, we dropped China, India and Sri Lanka (our key countries). Further we deleted from the list European Union, as the individual member countries of EU are already covered in our list. This gives us a list of 165 countries as the control countries *c'* for this study. (Annex II Table A).

We use the commodity and time variation in the tariff preferences allowed under ISLFTA, to identify the ISLFTA's effect on sourcing of commodities from a non-ISLFTA country *c'* (control countries) to ISLFTA partners(country 1) and China (country 2). The idea is when FTA causes a preferential treatment to the Sri Lankan goods, the consumers in India, tend to substitute the preferential goods for the goods from other sources (including the domestic production). Similarly, the Sri Lankan consumer will substitute the goods of Indian origin, if they have preferential treatment compared to the goods from rest of the trading partners. On the other hand, for the goods, where the ISLFTA does not offer new preference (i.e. when the MFN tariff rates are almost zero), the impact of ISLFTA comes through the 'border effects' that go beyond the tariff liberalization, as could be seen from the increased import volumes of commodities on ISLFTA negative list.

In order to ensure the robustness of our results, in the second part of our analysis, we use 6 other countries as 'country 2'. We select 'country 2' based on the principle mentioned above (i.e. when choose 'country 2' as China). We choose United States (US), European Union (EU15) , Indonesia, Australia, Switzerland and Malaysia for this purpose. The Control Countries c' for US, EU15, Australia and Switzerland are listed in Annex II Table B (170 countries), Table C (144 countries), Table D (173 countries),

Table E (159 countries) and respectively. The control countries when we choose Indonesia or Malaysia as our 'country 2' are in Annex II Table A (165 countries)[13].

5 Theoretical Framework and Empirical Strategy

In this section, we provide a short outline of the model, which rather than being exhaustive, highlights the needed features for the empirical strategy[14]. In this model, the firms are assumed to produce goods under the perfect competition. Trade is assumed to be driven by varieties and the commodities are differentiated by its source of origin. The FTA causes a shift in sourcing of varieties by consumers by substituting the goods from the source having preferential access to the FTA partners' market.

In every period t consumers in each country c are assumed to maximize Cobb-Douglas utilities of their consumption of the output of each industry $Q_{ct}(z)$ with the fraction of income spent on industry z being $b_c(z)$.

The utilities for consumers in country c are as:

$$U_{ct} = \int_0^1 b_c(z)\ln Q_{ct}(z)dz \tag{1}$$

$$\int_0^1 b_c(z)dz = 1 \tag{2}$$

The outputs of a country's firms are identical products, but different countries produce different products in the same industry. $Q_{ct}(z)$ can be interpreted as a sub-utility function that depends on the quantity of each variety of z consumed. $Q_{ct}(z)$ is defined as under:

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[13] The control countries, when we choose Indonesia or Malaysia as our 'country 2' are same as those when 'country 2' chosen is China (Table A) . This is due to the fact that both Indonesia and Malaysia are among the ten ASEAN countries having preferential trade relations with China.

[14] Here we focus on demand side only. For complete equilibrium analysis for FTA, Romalis (2005) may be referred.

$$Q_{ct}(z) = \left(\sum_{c'}^{N} q_{ct}^{D}(z_{c'})^{\frac{\sigma_z - 1}{\sigma_z}} \right)^{\frac{\sigma_z}{\sigma_z - 1}} \tag{3}$$

where, elasticity of substitution $\sigma_z > 1$ and $q_{ct}^{D}(z_{c'})$ denote the quantity consumed in country c of commodity z produced in country c'.

The demand function in country c, for a commodity z from country c', $q_{ct}^{D}(z_{c'})$ is assumed to be a CES function. The demand for $z_{c'}$ is assumed to depend on seven variables -- $a_t(q_t^s(z_{c'}))$: the marginal cost of production of commodity in country c'; $\tau_{ct}(z_{c'}) - 1$: the ad-valorem tariff[15,16] imposed on z from c' by country c; $g_{ct}(z_{c'})$: transport costs for international trade; $\hat{P}_{ctz}$: the ideal price index for commodity z in country c; Y_{ct}: the GDP of country c; $b_c(z)$: the expenditure weights in the utility functions for country c, which is the consumption in country c of each HS 6-digit product (regardless of source) divided by the GDP of country c; and the mean elasticity of demand σ; as per the following log linear equation:

$$\ln q_{ct}^{D}(z_{c'}) = -\sigma \ln a_t(z_{c'}) - \sigma \ln \tau_{ct}(z_{c'}) - \sigma \ln g_{ct}(z_{c'}) + (\sigma - 1) \ln \hat{P}_{ctz} + \ln b_c(z_{c'}) Y_{ct} \tag{4}$$

where $\hat{P}_{ctz}$, the ideal price index for commodity z in country c is defined as:

$$\hat{P}_{ctz} = \left[\sum_{c'} (a_t g_{ct} \tau_{ct}(z_{c'}))^{1-\sigma} \right]^{\frac{1}{1-\sigma}} \tag{5}$$

The transport costs for international trade are assumed to be in the 'iceberg' form i.e. $g_{ct}(z_{c'})$ units must be shipped from country c' for 1 unit to arrive in country c.

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[15] Ad valorem tariffs are taxes that are levied as a fraction of the value of the imported goods (for example, a 15% India's tariff on imported t-shirt).

[16] On some products the duties are imposed as specific tariffs (or duties). Specific duties are levied as a fixed charge for each unit of goods imported (for example, $ 2.5 per kg of yarn, or $ 2.5 per pc of shirt) and we have to convert them to ad valorem equivalents following NAMA methodology.

If we denote country c in equation (4) as 'country 1' (say both ISLFTA countries together) , the demand function for 'country 1' for commodity z from country c' (non-ISLFTA country) becomes:

$$\ln q_{1t}^D(z_{c'}) = -\sigma \ln a_t(z_{c'}) - \sigma \ln \tau_{1t}(z_{c'}) - \sigma \ln g_{1t}(z_{c'}) + (\sigma-1)\ln \hat{P}_{1tz} + \ln b_1(z_{c'})Y_{1t} \qquad (6)$$

We have a similar log linear CES demand function for 'country 2' (say China) for commodity z from country c' (non-ISLFTA country):

$$\ln q_{2t}^D(z_{c'}) = -\sigma \ln a_t(z_{c'}) - \sigma \ln \tau_{2t}(z_{c'}) - \sigma \ln g_{2t}(z_{c'}) + (\sigma-1)\ln \hat{P}_{2tz} + \ln b_2(z_{c'})Y_{1t} \qquad (7)$$

By combining (6) and (7), we can compare the value of exports of commodity z from country c' (non-ISLFTA, e.g. Annex II Table A countries) to country 1 (ISLFTA region) and to country 2 (China), grossed up for transport costs and tariffs.

$$\ln \frac{a_t g_{1t} \tau_{1t} q_{1t}^D(z_{c'})}{a_t g_{2t} \tau_{2t} q_{2t}^D(z_{c'})} = -(\sigma-1)\ln \frac{\tau_{1t}(z_{c'})}{\tau_{2t}(z_{c'})} - (\sigma-1)\ln \frac{g_{1t}(z_{c'})}{g_{2t}(z_{c'})} + (\sigma-1)\ln \frac{\hat{P}_{1tz}}{\hat{P}_{2tz}} + \ln \frac{b_1(z)Y_{1t}}{b_2(z)Y_{2t}} \qquad (8)$$

This helps us to get rid of $a_t(q_t^s(z_c))$: the marginal cost of production of commodity in country c, which we do not know.

Trade Creation for rest of the world may result form ISLFTA, because tariff reductions among partners directly lowers $\hat{P}_{1tz}$ in the ISLFTA region (country 1) as one of the member of the ISLFTA would ultimately displace the higher cost domestic producers of commodity z in the partner country. With the result consumers in ISLFTA region (country 1) will have more income to buy goods from the non-ISLFTA country c' (rest of the world) . The exports of non-FTA country c' to ISLFTA region will increase resulting into trade creation for rest of the world.

On the other hand, it is possible that due to preferential tariffs, a partner country's production might displace the lower cost suppliers from non-ISLFTA country c' in the ISLFTA region (country 1). Trade diversion for rest of the world may result because

tariff reductions on FTA partners' output directly lower $\hat{P}_{1tz}$, thereby depressing exports from other countries *c'* to India and Sri Lanka.

A regression of the log-difference between ISLFTA partners' combined imports and 'country 2' imports from the control countries on preferential and MFN tariffs should reveal trade diversion or trade creation. In the absence of a closed-form solution for how prices respond to tariff changes we estimate[17] the following equation:

$$\ln \frac{M_{FTAt}(z_{c'})}{M_{2t}(z_{c'})} = \beta_1 \ln \tau_{Ind,t}(z_{SL}) + \beta_2 \ln \tau_{SL,t}(z_{Ind}) + \beta_3 \ln \tau_{Ind,t}(z_{MFN}) + \beta_4 \ln \tau_{SL,t}(z_{MFN})$$

$$+ \beta_5 \ln \tau_{2,t}(z_{MFN}) + D_z + D_t + \varepsilon_{zt} \tag{9}$$

where $M_{FTAt}(z_{c'})$ is the ISLFTA (combined India and Sri Lanka) import of commodity *z* from the control countries *c'* measured on a CIF basis and $M_{2t}(z_{c'})$ is the 'country 2' import of commodity *z* from the control countries *c'* measured similarly. The explanatory variables are preferential and MFN tariffs. For example, $\tau_{Ind,t}(z_{SL})$ is India's tariff on product *z* imported from Sri Lanka plus one, and $\tau_{Ind,t}(z_{MFN})$ is India's MFN tariff on product *z* plus one. The above equation, compared to equation (8) helps us to get rid of $\hat{P}_{ctz}$: the ideal price index for commodity *z* in country *c*. We also assume that relative transport costs $\ln \frac{g_{1t}(z_{c'})}{g_{2t}(z_{c'})}$ and relative expenditures $\ln \frac{b_1(z)Y_{1t}}{b_2(z)Y_{2t}}$ are captured by full sets of product (D_z) and year (D_t) fixed effects and a disturbance term (ε_{zt}) that is independent of the tariffs and fixed effects. The sum of the coefficients on the preferential tariffs (β1 and β2) may reveal the rise (or fall) in exports from the control countries *c'* to ISLFTA region relative to 'country 2' that results from a 1 percent reduction in intra-ISLFTA tariffs. If the sum of β1 and β2 is negative (positive), it will show us that trade from non-ISLFTA member countries is created (or diverted) as a result of ISLFTA.

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[17] Following Romalis (2005), section 4 D.

6 Data, Sources and its Characteristics

We focus our study for the period 1996 to 2006 i.e. 5 years before ISLFTA and 6 years after ISLFTA by using 6 digit HS 1996 classification data. Basically, we use two types of data --- the applied tariff data[18] and trade data. The major source of data for this study is World Bank's World Integrated Trade Solution (WITS) database and Global Trade Atlas (GTA) of Global Trade Information (GTI) Services. WITS provides access to three other important sources of data – TRAINS (by UNCTAD), COMTRADE (by UNSD) and IDB (by WTO) and GTI is one of the leading supplier of international merchandise trade data. As we use highly rich dataset for our regression analysis, for transparency purposes, it would be useful to discuss the challenges we faced and how we tackled them.

6.1   Tariff Data:

We prefer to use tariff data form TRAINS, IDB and National Governments in the order of preference[19].

Tariff data for India—Tariff data for India was collected from three sources ---IDB for years 1996, 2000, 2002; TRAINS for years 1997, 1999, 2001, 2004, 2005; and Indian Government for years 2003 and 2006. There are four major issues with Indian tariff data. First, we do not have data for the year 1998, for which we use the 1997 data as a proxy. Second, the data for the years 1996 to 2001 is on HS 1996 classification[20]

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[18] Actual tariffs or import duties applied by WTO member countries on their imports, as opposed to tariff rates that are bound or committed.

[19] There are two reasons for using the data sources in this order of preference. First, we need all tariff data on ad-valorem basis not on specific duty basis. Our key countries have specific duties on some of the tariff lines (for example, India 271 HS lines for 2000 to 2006; China 27 lines in 2001 and 23 lines in 2005; and Sri Lanka 29 in 1998 and 64 lines in 2004). Using TRAINS under WITS provide an automatic conversion of these specific duties to ad-valorem equivalents using WTO NAMA methodology. Second, in case the national tariffs are recorded on HS 8 digit basis; TRAINS under WITS also averages the tariffs to the corresponding HS 6 digits for all the tariff lines. Our second preference is for the IDB under WITS. It again converts the HS 8 digit tariffs to average tariffs on HS 6 digit level, but the IDB does not provide an automatic conversion of specific duties to the ad-valorem equivalents as provided by TRAINS database. Our last preference is for the Government tariff data, as these are not available electronically and are mostly are on HS 8 digit level. We have to manually calculate the averages for the corresponding HS 6 digit tariff and put the data in electronic form before using for our analysis.

[20] HS 1996 classification has 5113 items (or products) on six digit basis.

and for the years 2002 to 2006 the data is on HS 2002 classification[21]. As we are working with HS 1996 for our study, we use concordance tables from WITS to convert the linewise tariff data from HS 2002 to HS 1996 for the years 2002, 2003, 2004, 2005 and 2006. Third, conversion of specific duties on 271 Textiles and Clothing sector products to ad-valorem equivalents for the years 2000 to 2006. For the years 2001, 2004, 2005 we source tariff data from TRAINS. The WITS provided an automatic conversion of these specific duties to ad-valorem equivalents using WTO NAMA methodology[22]. For the years 2000, 2002, 2003 and 2006 i.e. when we do not have data from TRAINS, we cannot get such ad-valorem equivalents through the WITS. So for the years 2000, 2002 (when we source data from IDB) and for the years 2003 and 2006 (when we use Indian Government data), we use the ad-valorem equivalents of specific duties from the nearest year[23], available from TRAINS. Fourth, the missing data on HS lines within a year. These are only a few lines, so we use the applied tariff rate on nearest HS line from the same year to handle this issue.

Tariff data for Sri Lanka-- Tariff data for Sri Lanka was collected from two sources ---IDB for years 1998, 2001 (for preferential tariff), 2003; TRAINS for years 1997, 2000, 2001 (for MFN tariff), 2004, 2005 and 2006. Again there are four major issues with Sri Lankan tariff data. First, we do not have data for the years 1996, 1999 and 2002. We take tariffs of the nearest available year as proxies for the missing years[24]. Second, Sri Lanka's applied tariff rates is for the year 1997 is in HS 1988/92 classification[25]; for 1998, 2000, 2001 data is in HS 1996 and for 2003, 2004, 2005 and

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[21] HS 2002 classification has 5224 items (or products) on six digit basis

[22] WITS provides four different ways of conversion of specific duties to ad-valorem equivalents (AVEs)—UNCTAD Method 1, Method 2, WTO Agriculture Method and WTO NAMA method. As most of our trade is of non-agricultural goods, we prefer to choose WTO NAMA method. Choosing other methodology may not make any changes in our results and conclusions of the study.

[23] Indian Government introduced specific duties, since 2000, on 271 items of Textile and Clothing sector as ' x % or Rs y per unit, whichever is higher'. It was observed that all most all the ad-valorem equivalents of the specific components of tariff are higher than the corresponding ad-valorem duties, so effectively the specific duties are the applied rates of import duties. India did not change the specific duty components on these 271 products even though the government lowered the ad-valorem components on these product lines for the period 2000 to 2006. That is why the use of ad-valorem equivalents of specific duties from the nearest year is perfectly justified.

[24] For the year 1996, we take tariffs from 1997; for the year 1999 we use 2000 tariffs and for the year 2002 , we use the data of 2003. It is observed that there is not much difference between applied tariffs in 2001 and 2003 so the use of 2003 data for the 2002 seems justified.

[25] HS 1988/92 classification has 5020 items (or products) on six digit basis.

2006 data is in HS 2002 classification. We again use WITS concordance tables to convert the data[26] to HS 1996 classification. Third, the issue of specific duties on different items in different years. For example, Sri Lanka has specific duties on 29 tariff lines in 1998 but on 64 lines in 2004. For conversion to ad-valorem equivalents, we use the data of the nearest available year from TRAINS. Fourth, the missing data on HS lines within a year. This issue is handled by using the applied tariff rates from the nearest HS line from the same year.

Tariff data for 'country 2' —Due to China's entry into WTO as late as in 2001, its tariff data is easily available. Tariff data for China was collected from two sources --- TRAINS for years 1996, 1997, 1998, 1999, 2000, 2001, 2003, 2004, 2005 and 2006. IDB for the year 2002. WITS concordance table was used to convert the data from HS 2002 (for the years 2002 , 2003, 2004, 2005 and 2006) to HS 1996 classification. Otherwise, the China's data for the years 1996 to 2001 is available on HS 1996. Similarly, the tariff data for United States, EU15, Indonesia, Australia, Switzerland and Malaysia is also collected from TRAINS and IDB through WITS. The issues of missing data, concordance of HS classifications and specific duties, wherever required are handled in the same manner as described above in case of India or Sri Lanka's tariff data.

6.2   Trade Data[27]:   To run the regression for equation (9), we need imports by ISLFTA region ('country 1') form control countries c' on HS 1996 at 6 digit level and imports by China ('country 2') from control countries c' at the same level of details for the period 1996 to 2006. We get imports data for India and China (country 2) from the COMTRADE for all the years. Similarly, for US, EU 15, Indonesia, Australia, Switzerland and Malaysia as 'country 2' trade data is easily available from COMTRADE.

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[26] We observe that for 76 items from HS 1998/92 classification that do not have any concordance with the HS 1996 classification. All these items were used before 1995. So we drop them form our analysis as we are concentrating only on data from 1996 to 2006.

[27] Trade data is relatively easily available for all the countries on COMTRADE. It understood that compared to the tariff data, the trade data is unimportant for the purposes of tariff negotiations at WTO. Due to negotiation sensitivities, it is possible that some countries do not want to share full tariff data.

A caveat needs to be mentioned for Sri Lanka's import data. The import data for Sri Lanka is available only for the years 1998 (on IDB) and 1999, 2001, 2002, 2003, 2004, 2005 on COMTRADE. For the years 1996, 1997, 2000, and 2006 we need to use alternative sources of data. We use import data for the years 2000 and 2006 for Annex II Table A control countries from the Global Trade Atlas (GTA)[28]. Due to data constraints for Sri Lanka[29] for 1996 and 1997, we decided to use mirror data for *exports from control countries c'* to Sri Lanka as *imports by Sri Lanka* from control countries for these two years to get the complete dataset for the study period[30].

7 Estimation of Results and Discussion

Finally, we have seven different panels. Each panel is highly balanced with T (11 years) observations for each of the N individuals (over 5000 products). To estimate the parameters of equation (9), we choose both the Fixed Effects (FE) and the Random Effects (RE) model[31]. These two models allow for the heterogeneity across panel units and across time. We consider these two alternatives in the Hausman test framework, fitting both models and comparing their common coefficient estimates. As we might

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[28] The GTA has data for the years starting form 1998.

[29] For Annex Table B, C, D and E control countries we use mirror data on imports by Sri Lanka for years 1996, 1997, 2000 and 2006 due to unavailability of Sri Lanka's import data as reporter to COMTRADE.

[30] There may be difference of 5% to 6 % between the actual imports recorded by Sri Lanka (data not available) and the mirror data of imports by Sri Lanka from control countries (data available). This difference is due the fact that in COMTRADE, the imports are recorded CIF (Cost insurance and freight) while the exports are recorded FOB (free on board). Finally, since we use the combined imports by India (import data available for the period under study) and Sri Lanka (import data available for 1998 to 2006 and mirror data for 1996 and 1997) from control countries c'. As India is relatively a large trading partner in ISLFTA region, when we merge the two import data to get the combined imports by ISLFTA partners, the difference due to CIF and FOB values for 1996 and 1997 in Sri Lankan data gets further diluted.

[31] We do not use pooled OLS method to estimate our model $y_{it} = x_{it}\beta + u_i + v_t + \varepsilon_{it}$ as it would ignore the nature of the panel data and assumes $\beta = \beta_j \forall j, i, t$. This model will be highly restrictive and can have heteroskedasticity across panel units or serial correlation within panel units. We may choose the Between Estimators (BE), Fixed Effects (FE) or the Random Effects (RE) Model to estimate the panel coefficients of our model. In the BE, the group means of *y* are regressed on the group means of *x* in a regression of *N* observations. This estimator also ignores all the time variations in *y* and when the u_i are correlated with any of the regressors in the model, the zero-conditional-mean assumption does not hold and the between estimator produces inconsistent results. Finally, we are left with the FE and RE models that allows for the heterogeneity across panel units and across time. If the u_i are uncorrelated with the regressors, then we can use the RE, but if the u_i are correlated with the regressors, then we use the FE model.

expect from the different point estimates generated by RE estimator, the Hausman test's null hypothesis---that the RE estimator is consistent --is soundly rejected (Table 2). The individual effects do appear to be correlated with the regressors; hence our results are based on the Fixed Effects Model (FE).

A summary of the results using Fixed Effects model for seven panels are given in Table 1. Interpretation of these results will essentially provide the evidence, whether ISLFTA have been trade diverting (or trade creating). For interpreting the results, we refer to the log-difference of combined imports of ISLFTA partners and imports of 'country 2' from the control countries c', given by equation (9).

Column 1 of Table 1 gives the estimates of coefficients, when we use China as our 'country 2'. The results shows that the sum of the coefficients on the preferential tariffs (β1 and β2) is positive, suggesting that ISLFTA may be trade diverting for non-ISLFTA members (control countries c'). It shows that a 1% reduction in ISLFTA preferential tariffs will cause 1.12 % reduction in imports by the ISLFTA countries from control countries c' relative to imports by China from same control countries. All coefficients except β_2 are highly significant. The reduction in tariffs by India for Sri Lankan products is a major contributor to creation of more trade for Sri Lanka at the expense of control countries c'. The MFN applied average tariff by India in 2006 is 20.79%, while its tariff on Sri Lankan products is only 4.25% (Figure 2). On the other hand there is not much difference between Sri Lanka's MFN (11.82% in 2006) and preferential applied tariffs (9.08% in 2006) (Figure 3). This along with the fact that India is a major importer of control country c' products, explains the significance of β1 and non-significance of β2. The other coefficients i.e. β3, β4 and β5 are of expected (negative) sign and are highly significant. A reduction in MFN tariffs by the ISLFTA countries would increase the exports to this region from the control countries c'. Similarly, if country 2 (China) reduces its MFN tariff, the exports from control countries c' to country 2 will increase.

In the second part of our analysis, we substitute US, EU-15, Indonesia, Australia, Switzerland and Malaysia respectively as 'country 2' thereby forming six more panels.

The control countries c' also change to countries listed in Annex II Table B, Table C, Table A, Table D, Table E and Table A respectively. The results of regression for these panels are reported in column 2 to 7 (Table 1). The sum of coefficients β1 and β2 is negative in all these six cases. For example, in column 2, when we 'country 2' is US, we have sum of β1 and β2 equals −3.080 . This shows that as per estimates of our model, when the ISLFTA countries reduce preferential tariffs by 1%, this results in an increase of 3% in exports to the ISLFTA partners from Table B control countries c' compared to exports from the same control countries to US. Once again, coefficients β3 and β4 are of expected (negative) sign and highly significant, showing that a 1% reduction in MFN tariffs by the ISLFTA countries would increase the exports from control countries c' to this region by around 4% compared to exports to US from the same countries. β5 in this case is insignificant. All the coefficients in next five panels in Table 1 (except β5 for in case of EU15, Switzerland and Malaysia as 'country2' and β4 in case of Australia and Switzerland as 'country 2') are strongly significant and can be interpreted similarly. Overall, we estimate that a 1% reduction in ISLFTA partners' preferential tariffs results in 2.6% to 4.9 % increase in exports from control countries c' to ISLFTA members compared to the exports from countries c' to 'country 2'.

As most of the coefficients of our model, including the rho and F-test statistics[32] establish the significance of our model; we conclude that our model is able to assess reasonably well the trade effects of ISLFTA.

One issue, which needs explanation is the difference in trade effects in panel 1 (trade diversion) and six other panels (trade creation) of Table 1. Two reasons can be given to explain this difference. First, in panel 1, 'country 2' (China) is the largest exporter to ISLFTA partners (1st to India and 3rd largest to Sri Lanka, in 2006). When we select the control countries c' with China as 'country 2', we have to exclude China from the list of control countries c'. This affects our results by way of exclusion of almost 16% of exports to ISLFTA partners in 2006. Second, we also have to exclude some other countries (e.g. Hong Kong, Malaysia, Taiwan, Indonesia and Thailand) having

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[32] Rho, F test, F statistic and R2 have similar interpretation for all of our seven panels, we discuss them together in detail in the Note below Table 1.

preferential relations with China from the list of control countries c'. These countries are among the top 10 exporters to ISLFTA region. These countries together with China constitute almost 30% of exports to ISLFTA countries in 2006. This produces biased estimates to our model by excluding a large percentage of imports by ISLFTA partners. On the other hand, when other six countries are substituted as 'country 2', we have to exclude only 3 to 10% of total imports by ISLFTA region for estimations of equation (9). Moreover, we find consistent and strongly significant results for our model form column 2 to 7 in Table 1. We, therefore, tend to give more weightage to the results obtained from panels having US, EU15 , Indonesia , Australia, Switzerland and Malaysia as 'country 2'. The results show that a 1% reduction in preferential tariffs among ISLFTA partners will increase 2.6% to 4.9% exports from control countries c' to ISLFTA partners as compared to the exports from control countries c' to 'country 2' .

8 Conclusion

We have shown in this study that ISLFTA has a slight trade creation effect on non-ISLFTA countries. The consumers in India and Sri Lanka are able to get some of the products from the most competitive suppliers within the region; with the result they are able to consume more goods with the same income. Apparently, this has a trade creation effect for the non-members. We have also shown that ISLFTA is one of the few South-South Agreements, which are working effectively. The success of ISLFTA has proved that if the concerns of smaller economy are taken into account with more favorable treatment, then the size differential in the economies of the FTA partners do not matter. Immediately, after the Agreement, there has been a jump in the trade flows, which could be attributed to the increased engagement of partner countries on products having preferential access and due to the 'border effect'. We have not gone into the sector specific analysis in this study which could be an interesting area for further research on ISLFTA.

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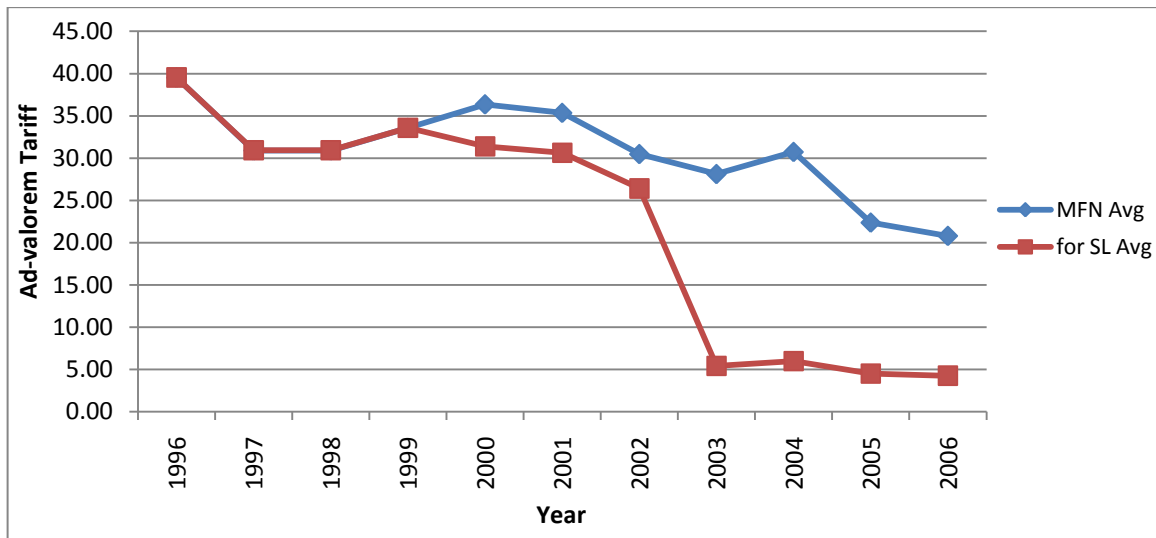
Figure 1 : Free Trade Agreements in Asia –Cumulative Status (as of December, 2007)
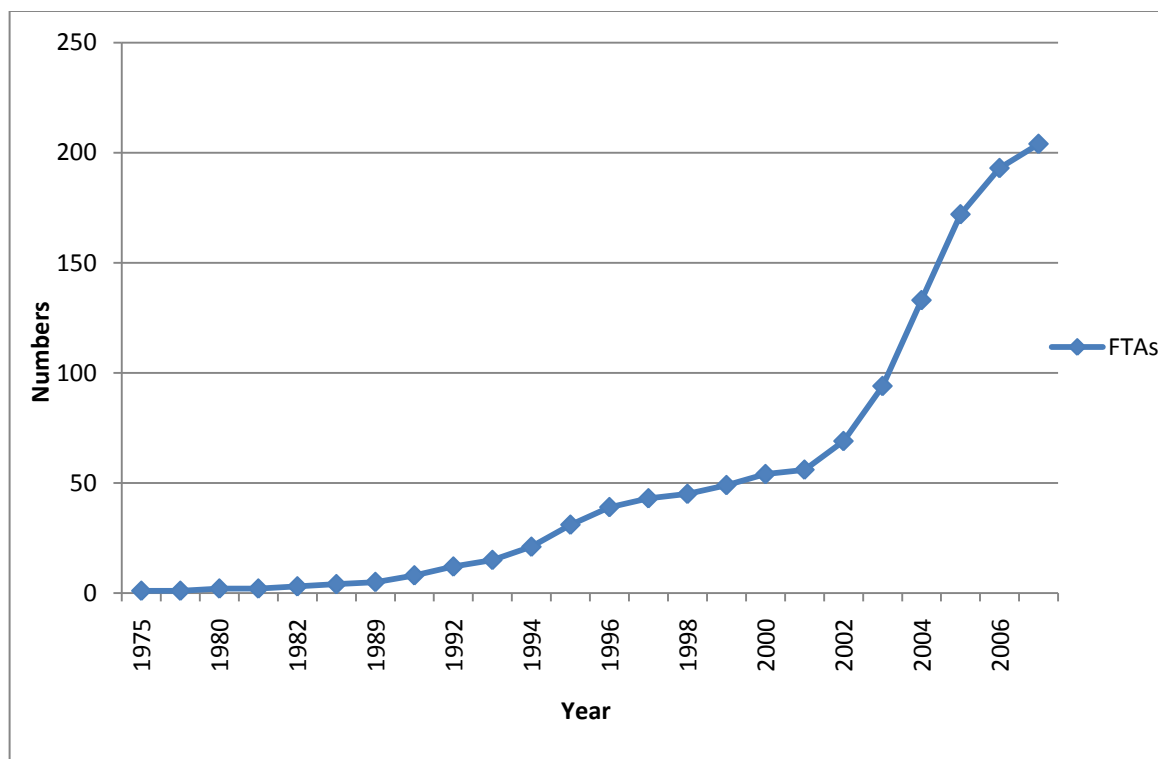
Data Source: ADB, Manila
Figure by Author

Note: The numbers include -- Proposed, Under Negotiation, Signed and Under Implementation Free Trade Agreements.
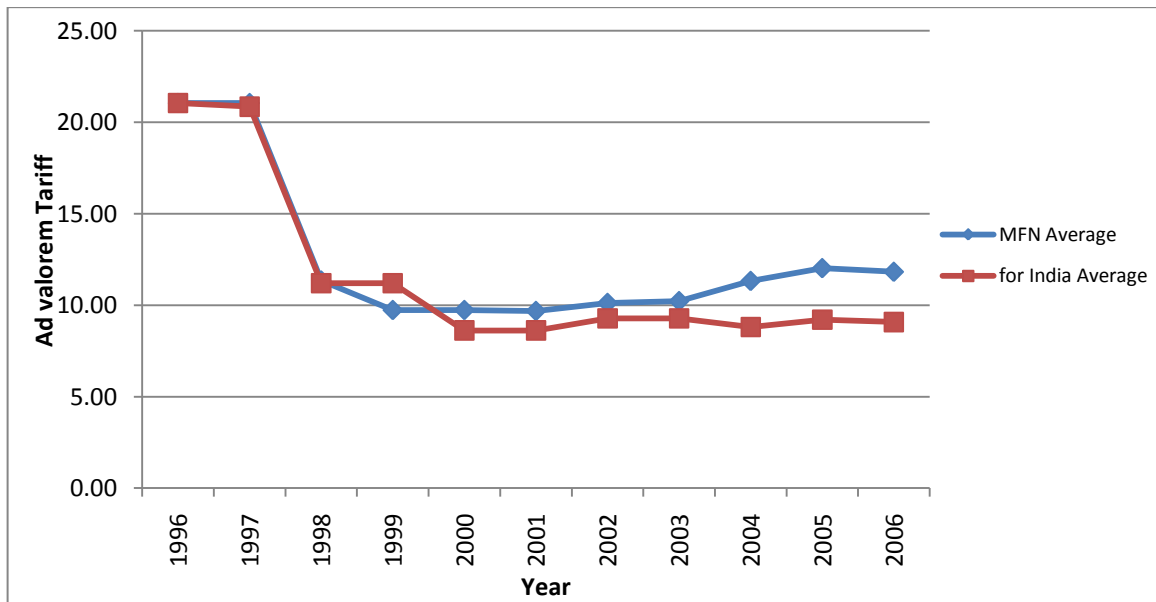
Figure 2: India's Average Applied MFN and Preferential Tariffs

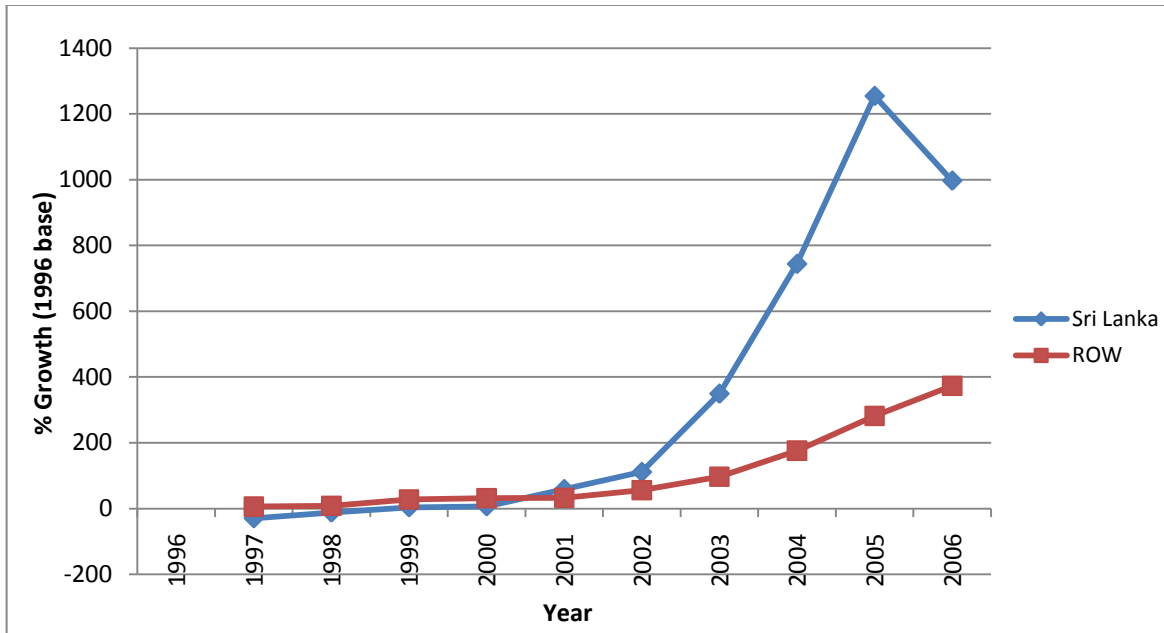Data Source: WITS, World Bank
Figure by Author

Figure 3: Sri Lanka's Average Applied MFN and Preferential Tariffs
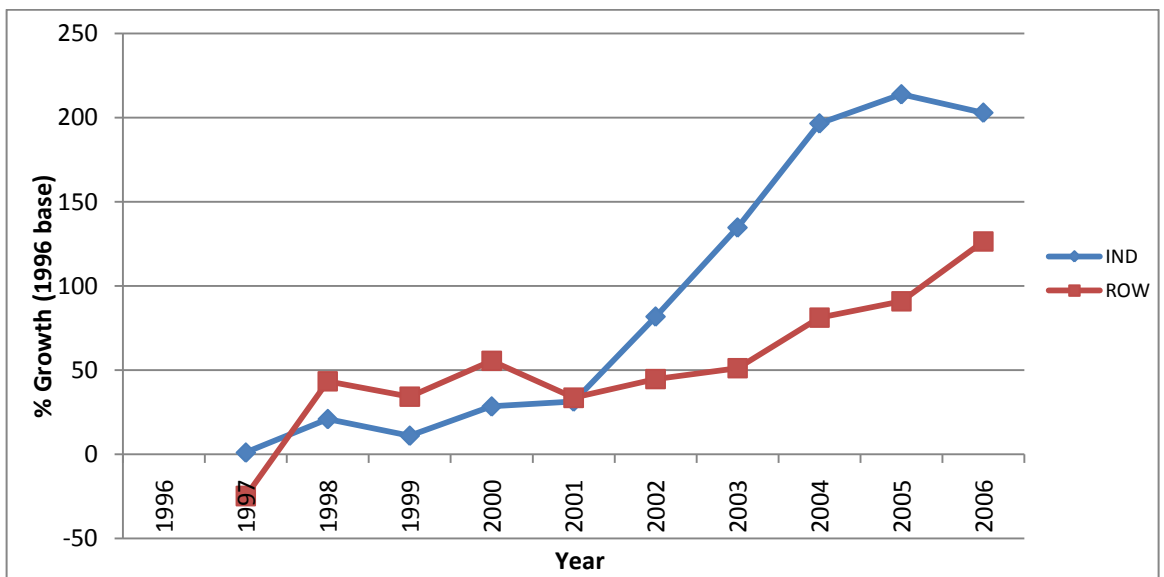

Data Source: WITS, World Bank
Figure by Author

Figure 4 : Growth in India's Imports from Sri Lanka and Rest of the World (1996 to 2006, index 1996=100)

Data Source: COMTRADE
Figure by Author
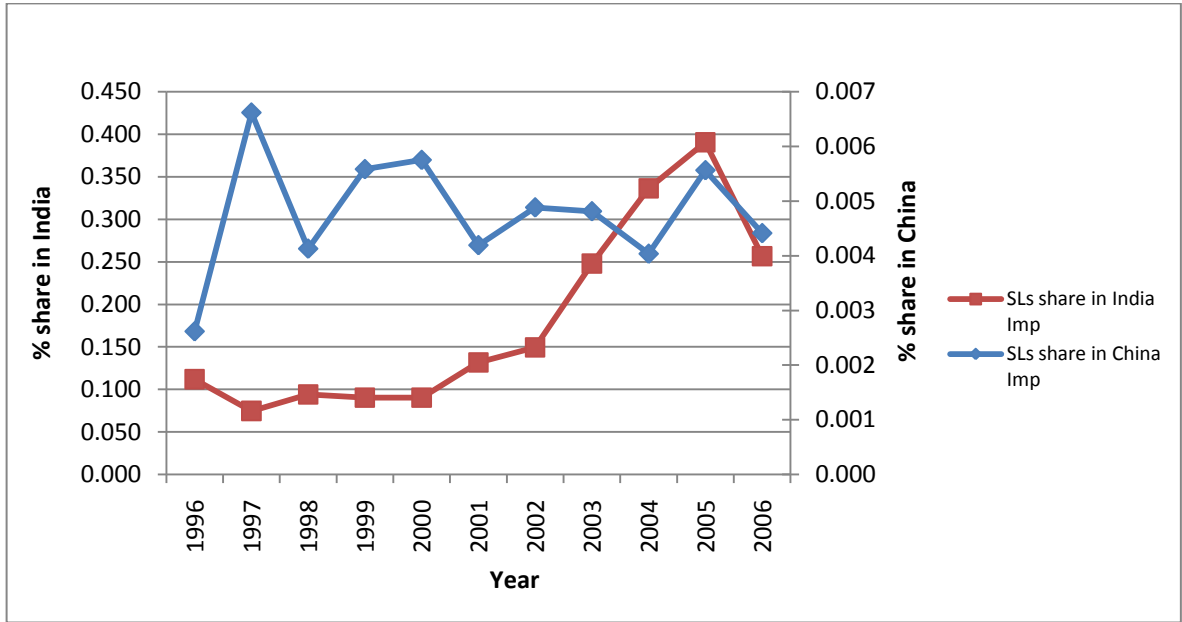
Figure 5 : Growth in Sri Lanka's Imports from India and Rest of the World (1996 to 2006, index 1996=100)

Data Source: COMTRADE
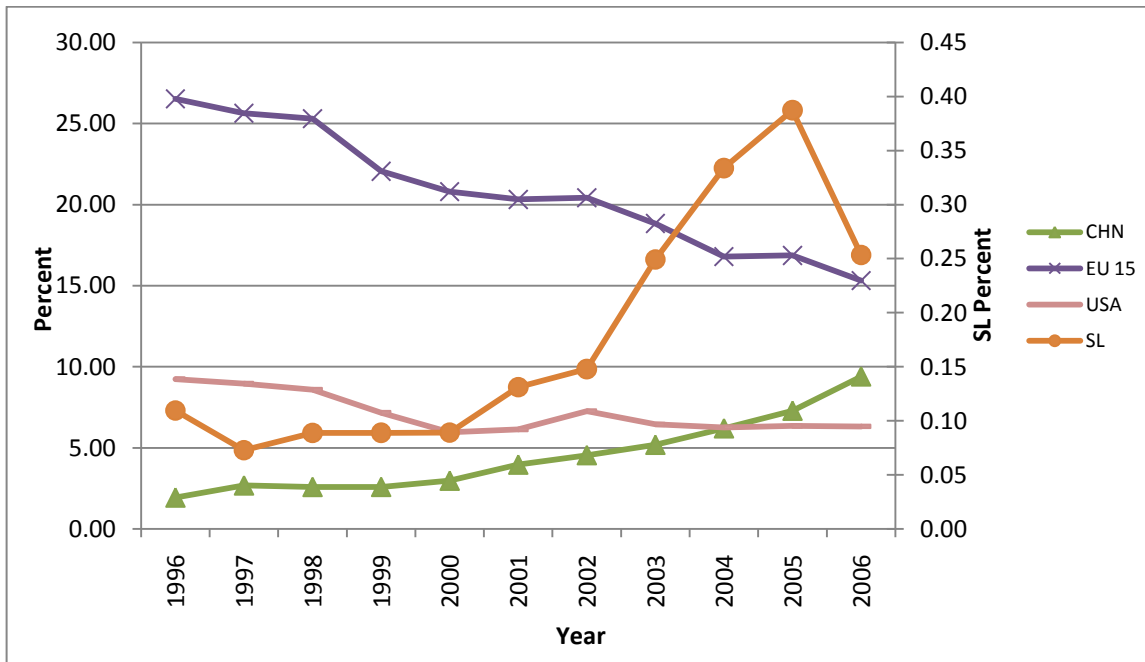Figure by Author

Figure 6: Share of Sri Lankan Goods to India and China's Total Imports
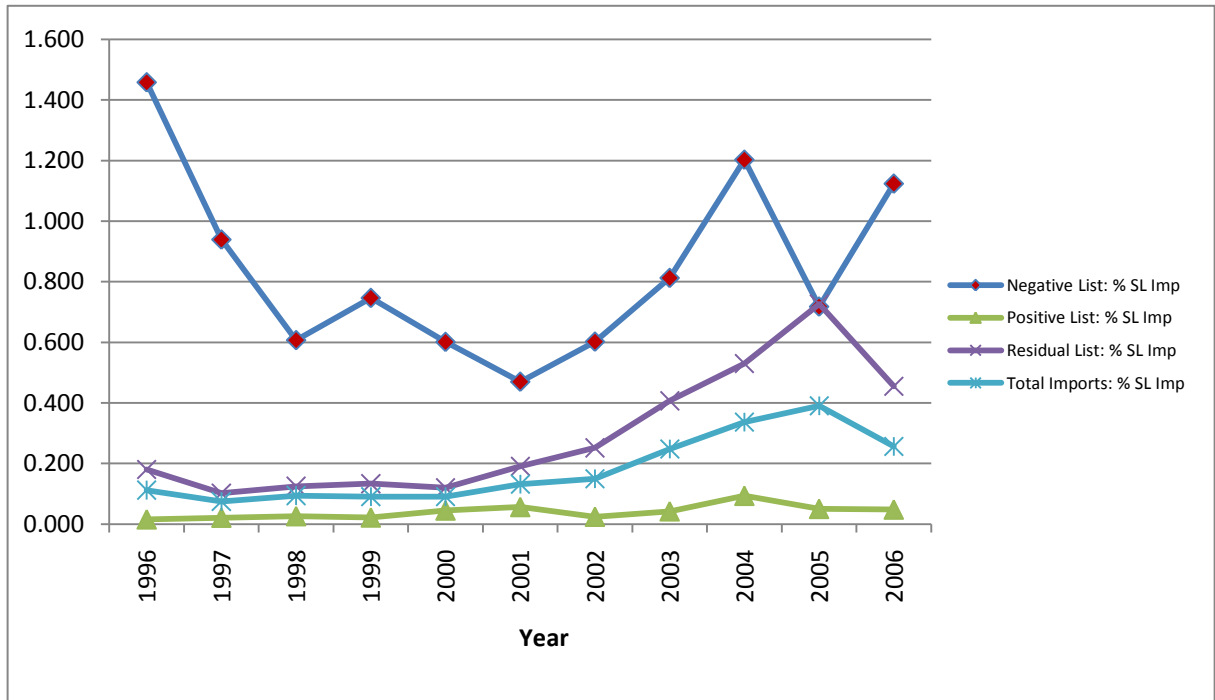

Data Source: COMTRADE
Figure by Author

**Figure 7: Share of Some Major Exporters and Sri Lanka
to India's Total Imports**

Data Source: COMTRADE
Figure by Author

**Figure 8: Sri Lanka's Share of India's Total Imports on Items
Under Different List of ISLFTA**

Data Source: COMTRADE
Figure by Author

Table 1

Trade Diversion/Creation Effects from India Sri Lanka FTA

lm#	1	2	3	4	5	6	7
Trade Diversion/ Creation	Diversion	Creation	Creation	Creation	Creation	Creation	Creation
$(\beta_1 + \beta_2)$	1.122 (0.000)	-3.080 (0.000)	-2.930 (0.000)	-3.944 (0.000)	-2.660 (0.000)	-3.269 (0.000)	-4.855 (0.000)
$\ln \tau_{Ind-SL}$	0.845 (0.079) 10.74***	-1.086 (0.065) -16.64***	-0.742 (0.063) -11.78***	-1.034 (0.086) -11.98***	-0.871 (0.071) -12.22***	-1.195 (0.084) -14.26***	-0.995 (.075) -13.34***
$\ln \tau_{SL-Ind}$	0.277 (0.296) 0.94	-1.994 (0.250) -7.96***	-2.188 (0.243) -9.01***	-2.910 (0.338) -8.60***	-1.789 (0.274) -6.53***	-2.074 (0.314) -6.60***	-3.860 (0.286) -13.48***
$\ln \tau_{Ind-MFN}$	-1.484 (0.136) -10.92***	-2.156 (0.113) -19.02***	-2.341 (0.110) -21.28***	-2.716 (0.153) -17.77***	-2.309 (0.127) -18.14***	-2.737 (0.147) -18.64***	-2.057 (0.132) -15.64***
$\ln \tau_{SL-MFN}$	-0.873 (0.280) -3.11***	0.626 (0.238) 2.62***	0.374 (0.233) 1.60*	-1.868 (0.319) -5.85***	-0.221 (0.260) -0.85	-0.369 (0.300) -1.23	-0.797 (0.274) -2.91***
$\ln \tau_{country\ 2-MFN}$	-1.055 (0.199) -5.29***	0.121 (0.618) 0.20	-0.414 (0.292) -1.42	-0.842 (0.364) -2.31**	-3.615 (0.492) -7.34***	-0.700 (0.444) -1.58	-0.181 (0.163) -1.11
_constant	-1.340 (0.031) -42.76***	-2.330 (0.030) -76.50***	-2.894 (0.027) -108.60***	1.916 (0.037) 51.47***	0.537 (0.030) 18.06***	2.030 (0.035) 58.08***	0.887 (0.031) 28.54***
Country 2	China	USA	EU15	Indonesia	Australia	Switzer- land	Malaysia
Control Countries	Table A	Table B	Table C	Table A	Table D	Table E	Table A
Number of Observations	49721	49775	50637	48504	48652	45702	46661
Number of products	4987	5013	5049	4998	4942	4916	4935
R-sq within	0.005	0.058	0.054	0.066	0.057	0.059	0.074
rho (variation due to u_i)	0.678	0.812	0.784	0.626	0.783	0.802	0.677
F(n-1, N-n-k) F test that all u_i =0	17.25 (0.000)	34.58 (0.000)	29.29 (0.000)	13.29 (0.000)	28.35 (0.000)	29.88 (0.000)	16.36 (0.000)
F (k, N-n-k) significance of the model	43.66 (0.000)	550.31 (0.000)	524.84 (0.000)	618.55 (0.000)	523.58 (0.000)	514.89 (0.000)	666.16 (0.000)

*** shows coefficient is significant at 1% level.

**   shows coefficient is significant at 5% level.

*   shows coefficient is significant at 10% level.

N= number of observations, *n*= number of groups, *k*= number of dependent variables.

For explanation of various entries in the above table, refer note on the next page.

Note on Table 1:

i) # lm (the dependent variable)
 = log (Import in India +Sri Lanka form the control countries) – log (Import in 'country 2' form the control countries c') for each HS 6 digit product for each year (1996 to 2006), i.e. log-difference between FTA partners' combined imports and 'country 2' import form the Control Countries.

ii) The Control Countries are selected based on 'country 2' chosen for analysis. The Control Countries are shown in Table A, B, C, D and E. Control Countries include all the countries reporting the data to COMTRADE, minus India, Sri Lanka, 'country 2' and other countries having preferential trade arrangement with 'country 2'. For example, in case of China, the Annex II Table A Control Countries include--- 180 COMTRADE countries minus China, India, Sri Lanka, Hong Kong China, Macao China, and ASEAN countries (Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam) i.e. 165 countries.

iii) The dependent variable (lm) is regressed on tariffs on 6 digit products of HS 1996 classification applied by

 (a) India on Sri Lankan imports—preferential tariffs,
 (b) Sri Lanka on Indian imports—preferential tariffs,
 (c) India on imports from control countries—MFN tariffs,
 (d) Sri Lanka on imports from control countries—MFN tariffs,
 (e) the 'country 2' on imports form control countries—MFN tariffs.

iv) We use simple average of applied ad valorem tariffs for all products at 6 digit level. For the products with specific duties, we calculate the ad-valorem equivalents form WITS by using methodology adopted in NAMA negotiations at WTO.

v) The Import of products is measured on a CIF basis, the units used are $'000 per year.

vi) We use Product Specific Effects and Time Specific Effects in our model and use Panel Data Fixed Effects methodology for all our estimations.

viii) The first row of the above table reports Trade Diversion or Trade Creation effects based on sign of the sum of coefficients ($\beta_1 + \beta_2$) of preferential tariffs charged by FTA partners . The second row reports the sum of the coefficients $\beta_1 + \beta_2$ (the first two coefficients reported below). The p- value is based on a F-test that the coefficients on the regressors are all jointly zero. The p-values are reported in the brackets below $\beta_1 + \beta_2$. A positive significant sum of the coefficients $\beta_1 + \beta_2$, indicate Trade Diversion as a result of the ISLFTA. A negative significant sum of the two coefficients indicates Trade Creation Effects resulting from the ISLFTA.

ix) The figures reported below the tariff coefficients in the brackets are the standard errors (se). The *t*-values are shown below the se in each cell of the table. The significant *t*-values are marked by asterisks at acceptable level of significance.

x) _cons : Stata fits a model, in which the u_i (i.e. individual specific fixed effects D_z) are taken as deviations from one constant term, displayed as _cons.

x) The number of observations with different 'country 2' varies due the change in products imported by these countries from the control countries. In addition, the difference also arises because; we have dropped the observations with extremely high tariffs (more than 65%).

xi) R^2 (within) is reported in the fourth last row. Stata command xtreg, fe obtains its estimates by performing OLS on transformed model, so the R^2 reported do not have all the properties of the OLS R^2 .

xi)   rho values estimate that 67 % to 81% of variation in log-difference between combined imports of ISLFTA partners and imports of 'country 2' from the control countries c' (i.e. dependent variable ,lm) is due to the product specific differences u_i (i.e. D_z) .

xii)   F (*n-1, N-n-k*) : F test provides a test of the null hypothesis H_o that all $u_i =0$. In other words, we wish to test whether the individual specific heterogeneity of u_i is necessary i.e. are there distinguishable intercept terms across units? A rejection of this H_o indicates that pooled OLS would produce inconsistent estimates.

xiii)   F (k, N-n-k): F statistics to test the null Ho that the coefficients on the regressors (dependent variables) are jointly zero i.e. whether our model is overall significant. A rejection of Ho implies that our model is overall significant. The F-statistic in all the cases shows high significance level for our model as a tool to explain the trade effects of the FTA.

Table 2

Hausman Test for Choosing between FE and RE

Country 2 →		China	United States	EU 15	Indonesia
$\ln \tau_{Ind-SL}$	fix (b) ran (B)	0.845 0.775	-1.086 -1.006	-0.742 -0.677	-1.034 -0.985
$\ln \tau_{SL-Ind}$	fix (b) ran (B)	0.277 0.375	-1.994 -2.337	-2.188 -2.622	-2.910 -3.114
$\ln \tau_{Ind-MFN}$	fix (b) ran (B)	-1.484 -1.366	-2.156 -2.199	-2.341 -2.245	-2.716 -2.879
$\ln \tau_{SL-MFN}$	fix (b) ran (B)	-0.873 -0.792	0.626 0.282	0.373 0.172	-1.868 -1.537
$\ln \tau_{country\ 2-MFN}$	fix (b) ran (B)	-1.055 -1.050	0.120 -0.094	-0.413 -1.025	-0.8417 1.301
chi2(5) (Prob>chi2)		37.42 (0.000)	551.18 (0.000)	480.68 (0.000)	425.07 (0.000)

Country 2 →		Australia	Switzerland	Malaysia
$\ln \tau_{Ind-SL}$	fix (b) ran (B)	-0.871 -0.769	-1.195 -1.081	-0.995 -0.917
$\ln \tau_{SL-Ind}$	fix (b) ran (B)	-1.788 -2.079	-2.074 -2.527	-3.860 -3.918
$\ln \tau_{Ind-MFN}$	fix (b) ran (B)	-2.308 -2.316	-2.737 -2.790	-2.057 -2.045
$\ln \tau_{SL-MFN}$	fix (b) ran (B)	-0.221 -0.504	-0.369 -0.694	-0.797 -0.908
$\ln \tau_{country\ 2-MFN}$	fix (b) ran (B)	-3.615 -5.509	-0.700 -0.584	-0.181 0.0259
chi2(5) (Prob>chi2)		280.19 (0.000)	380.11 (0.000)	129.59 (0.000)

b = consistent under Ho and Ha; obtained from xtreg,
B = inconsistent under Ha, efficient under Ho; obtained from xtreg
Test: Ho: difference in coefficients not systematic
chi2(5) = (b-B)'[(V_b-V_B)^(-1)] (b-B)

As we might expect from the different point estimate generated by the RE estimator, the Hausman test's null hypothesis --that the RE estimator is consistent -- is soundly rejected. The product-level individual effects do appear to be correlated with the regressors.

ISLFTA – Commitment of Member Countries in Brief[33]

Mutual phased tariff concessions on 5112 items on 6 digits (HS1996) have been agreed. An eight year time-table was specified for phasing out tariffs on all tariff lines, except the items on negative list of each country.

India's commitment:
  i)   Duty free access to 1,351 items upon entry into force of the Agreement in March 2000.
  ii)   Duty concession of 25% on 528 items in HS chapters 51 to 56, 58 to 60 and 63.
  iii)   Margin of preference of 50% on the remaining items of 2,799 increased to 100% in two stages in March 2003
  iv)   Duty concession of 50% on 233 tariff items of ready made garments and 5 tariff items of tea. This concession is under a tariff rate quota (TRQ)[34] of 15 million kg on tea and of 8 million pieces on garments.
  v)   Negative List of 429 items from rubber, paper, plastic, coconuts, alcoholic beverages and textile sector

Sri Lanka's commitment:
  i)   Duty free access to 319 items upon entry into force of the Agreement in March 2000.
  ii)   Margin of preference of 50% on 839 items deepened to 70%, 90% and 100% at the end of 2001, 2002 and 2003 respectively
  iii)   For 2,724 items, the tariff brought down to
   35% by March 2003
   70% by March 2006
   100% by March 2008
  iv)   Negative List of 1180 items from agriculture, automobile, electrical machinery, aluminum, copper, Iron & Steel, rubber, paper and plastic .

Rules of Origin:

  i)   the domestic value addition should be 35%; if the raw material /inputs are sourced from one member by the other, the value addition is reduced to 25% within the overall limit of 35%.
  ii)   inputs to undergo substantial transformation at 4 digit level of customs Harmonized Code; and
  iii)   a list of operations such as simple packing, cutting and assembly, have been defined which do not qualify for preferential market access.

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[33] For complete details, the interested reader is referred to Sri Lanka's Department of Commerce website. http://www.doc.gov.lk/web/indusrilanka_freetrade.php.
[34] A tariff rate quota is a quantity which can be imported at a certain duty. Any quantity above that amount is subject to a higher tariff.

Control Countries

Country 2	Table	List of Control Countries	Remarks
China	Table A	The 180 COMTRADE countries minus China, India, Sri Lanka, minus Hong Kong China, Macao China, and ASEAN countries (Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam).	165 Countries with no substantial change in preferential trade relations with China
United States	Table B	The 180 COMTRADE countries minus United States, India, Sri Lanka, minus Australia, Canada, Chile, Israel, Jordan, Mexico and Singapore.	170 Countries with no substantial change in preferential trade relations with the United States
European Union-15	Table C	The 180 COMTRADE countries minus EU-15, India, Sri Lanka, minus Algeria, Andorra, Chile, Croatia, Egypt, Faroe Island, Iceland, Israel, Jordan, Lebanon, Mexico, Morocco, Norway, South Africa, Syrian Arab Republic, Switzerland, Tunisia and Turkey.	144 Countries with no substantial change in preferential trade relations with the EU-15
Indonesia	Table A	The 180 COMTRADE countries minus China, India, Sri Lanka, minus Hong Kong China, Macao China, and ASEAN countries (Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam).	165 Countries with no substantial change in preferential trade relations with Indonesia
Australia	Table D	The 180 COMTRADE countries minus Australia, India, Sri Lanka, minus New Zealand, Singapore, Thailand and United States.	173 Countries with no substantial change in preferential trade relations with Australia
Switzerland	Table E	The 180 COMTRADE countries minus Switzerland, India, Sri Lanka, minus EU-15 (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom), Iceland, Liechtenstein, Norway (EFTA countries) and Faroe Islands.	159 Countries with no substantial change in preferential trade relations with Switzerland
Malaysia	Table A	The 180 COMTRADE countries minus China, India, Sri Lanka, minus Hong Kong China, Macao China, and ASEAN countries (Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam).	165 Countries with no substantial change in preferential trade relations with Malaysia

Note: The above table gives the list of control countries in brief. For transparency, the complete list can be obtained on request by sending an email to me at vivek.joshi@graduateinstitute.ch .