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EU-India Bilateral FTA: Potential Implications for the Excluded Low-Income Economies in Asia and Africa[1]

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Abstract

This paper provides an analysis on welfare, macroeconomic and trade impacts on a number of low-income economies as a result of a proposed bilateral FTA deal between the EU and India. A global general equilibrium modelling technique is applied for the analysis. A simulation of a scenario depicting a full FTA between India and EU is conducted. It appears that the EU-India FTA would result in welfare gains for both India and the EU. In absolute terms, the gains of EU would be much higher than that of India. However, in terms of share in GDP the gains of India would be much large than that of EU. India's welfare gain is mainly driven by the gain in terms of trade, whereas, EU's welfare gain is primarily because of gain in allocative efficiency. All the low-income economies under consideration would experience loss in welfare, and the welfare losses for the South Asian countries are much higher than the other low income economies in Asia and Africa. Bangladesh would appear to experience largest loss in welfare in absolute value, whereas rest of South Asia would incur largest loss in terms of share in GDP. The welfare losses of these low-income economies are mainly driven by the loss in terms of trade. However, in general, the extents of welfare loss in terms of share in their GDP for most of these countries are not very high. Most of these low-income countries would also experience loss in real GDP and loss in exports. For rest of South Asia, the loss in real GDP is as high as 0.17 percent and loss in exports is as high as 1.32 percent. Other South Asian countries like Bangladesh and Sri Lanka would also experience loss in exports by more than 0.9 percent. However, for most of the other countries, the loss in real GDP and loss in exports are not very large. Most of the low income countries under consideration would experience fall in exports both in the EU and Indian market mainly because of loss in preferences and diversion of trade in the EU and Indian market. However, the pattern of export loss is different for different countries. Countries like Bangladesh and Pakistan would suffer from larger export losses in the EU market compared to the Indian market whereas for Sri Lanka and rest of South Asia the impacts will be just the opposite. Most of the other low-income countries would however experience larger loss in exports in the EU market. The product wise figures suggest that Asian low-income countries' loss in exports in the EU market will be dominated by the loss in exports of textile and wearing apparels. Most of the African countries would however experience loss in exports of agricultural and agro-processing products in the EU market. In the Indian market, Sri Lanka and rest of South Asia would experience loss in exports in a number of mineral and manufacturing products. Bangladesh's loss in exports in the Indian market would be primarily the loss in exports of chemicals, rubber and plastics products. Most of the African countries would incur loss in exports of oil, minerals and mineral products in the Indian market. The simulation results in general suggest that the impacts of the EU-India FTA on most of the excluded low-income economies are not very large. It should however be mentioned that the impacts, as derived from the simulation results, are static in nature and the dynamic impacts could be much larger than the static impacts. For example, though the static loss in preference for Bangladesh's exports of textile and clothing in the EU market might appear to be small, such loss in preference might result in long term loss in competitiveness and thus the dynamic losses could be much larger than the static losses.

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EU-India Bilateral FTA: Potential Implications for the Excluded Low-Income Economies in Asia and Africa

Selim Raihan

I. Introduction

Since the beginning of the 1990s the world has witnessed ambitious multilateral trade negotiations along with a proliferation of regional trading blocs. With the inception of the World Trade Organisation (WTO) in 1995 as an institution to oversee the multilateral trading system and to promoting trade, many people thought that multilateralism would eventually reduce the scope of regionalism. Nevertheless, since 1995 the number of RTAs has increased from less than 150 to more than 250. Today, the quantum of global trade conducted through RTAs/PTAs is more than 50 percent of total trade flows.

It is rather paradoxical that despite the demonstrated benefits of unilateral liberalisation in the academic literature, bilateral FTAs and RTAs have proliferated. The proponents of regionalism consider RTAs as 'building blocks' to multilateralism, while the opponents recognise them as 'stumbling blocks' to worldwide free trade. Given that the progress on various multilateral trade negotiations is very slow, the emergence of Regional Trading Agreements (RTAs) has been seen by many as a preferred and feasible route to push an aggressive trade liberalisation agenda bypassing the WTO. Concerns have also been expressed that, rising bilateralism can actually weaken the interest of poor and vulnerable developing countries as these countries have to take much greater commitments for opening up and reforms under RTAs than under multilateral agreements.

Given the very nature of the bilateral/regional deals, they are discriminatory. Under such arrangements member countries exchange trade concessions to improve their relative competitiveness in their regional market over the rest of the world suppliers. Almost always the excluded countries that are subject to such discrimination include LDCs and other low income developing countries. By undermining competitiveness, discriminatory preferences may cause terms of trade shocks to suppliers from non-member countries, leading to adverse trade and welfare implications. Even when some poorer countries enjoy non-reciprocal trade concessions in the form of reduced tariffs or relaxed quantitative restrictions under various schemes such as GSP, formation and/or expansion of RTAs involving the preference donor countries will result in loss of preference for the traditionally preference dependent countries.

From the above perspectives, the on-going EU-India FTA negotiations have attracted a lot of attention amongst trade policy makers. In contrast to most of the developing economies, India is regarded as a country with significant supply side capacity. This means that in response to any meaningful trade concessions resulting from a bilateral deal, Indian suppliers can substantially increase their exports to the EU, perhaps at the cost of other developing countries and EU domestic suppliers. In this way, the likely trade diversion in EU may result in reduced imports from other developing and least developed countries and increased imports from India. On the other hand, India's tariff protection on a range of products is relatively high. Therefore, taking advantage of exchanged tariff concessions under the FTA, EU suppliers may replace India's imports from other sources resulting in trade diversion for India. Consequently, the overall welfare gains for India will depend on the relatively strength of the trade creation and trade diversion impacts.

Turning to its potential implications for other excluded developing countries, since the EU has been one of the principal export destinations form most of the LDCs and other low-income African, Caribbean and Pacific (ACP) countries where many of these countries also receive significant trade preferences, extension of similar preferences to India might result in their loss of competitiveness. Furthermore, a number of South Asian countries have now negotiated bilateral and regional FTAs with India, and, for these countries, an EU-India FTA could very well mean competing with EU suppliers in India's market. Needless to mention that, EU-India FTA also have trade consequences for other developing country suppliers in the EU as well as Indian market.

In the above backdrop, it is important to undertake a comprehensive assessment of the potential implications of EU-India FTA for India as well for various other low-income developing countries in Asia and Africa. Such an analysis is expected to provide important information on and insights into bilateral trade patterns of developing countries involving the EU and India, which in the process is likely to identify the scopes of loss of competitiveness for the excluded developing countries and the countries that are already enjoying trade preferences in the EU. The analysis will be useful to policy makers in developing countries by providing them with important information and by identifying a set of measures that can be of help to these countries.

The organisation of the report is as follows: After a brief introduction in Section I, Section II describes the methodology of the research. Section III presents and analysis of the theoretical and empirical perspectives of the RTAs. Section IV provides a background of the proposed EU-India FTA. Section V presents a summary of the empirical studies on EU-India FTA. Section VI analyses the structure of the excluded low-income economies in Asia and Africa. Section VII compares the trade similarity of the excluded low-Income economies with EU and India. Section VIII calculates the margins of preferences in the EU and Indian markets. Section IX provides a brief overview of the GTAP Model. Section X presents the simulation results and finally Section XI concludes.

II. Methodology

The study uses global databases and a suitable general equilibrium method to meet its specific objectives. Trade issues, by their nature, require an analytical framework that allows a holistic view of world economies. This is not only because of inter-linkages between various sectors in any given economy but also because of relationships between sectors in one economy to the rest of the world. These national, regional and global linkages may occur either in inputs or products markets or, as are usually the case, in both. Therefore, in order to avoid ignoring these linkages, a general equilibrium methodology such as one using the Global Trade Analysis Project (GTAP) model is one of the analytical instruments to be used in this study.

The global computable general equilibrium (CGE) modeling framework of the Global Trade Analysis Project (GTAP) is the best possible way for the *ex ante* analysis of economic and trade consequences of multilateral or bilateral trade agreements. The GTAP model is a comparative static model and uses a common global database for the CGE analysis. The study uses the Version 7 of the GTAP database which has 2004 as the base year. The GTAP database is updated to 2008 by incorporating different changes in global trade scenarios occurred during 2004 and 2008.

III. RTAs: Theoretical and Empirical Perspectives

Trade theory and evidences suggest that there are several forms of RTAs[3], which include: (i) Preferential Trade Area (PTA), where tariffs are lowered among the members but maintained against the outside world; (ii) FTA, where tariffs are removed among members but maintained against the outside world; (iii) Customs Union. where all tariffs amongst the members are eliminated, while external tariffs are adjusted to a common level; (iv) Common Market, which a Customs Union plus free movement of factors of production among the member countries; and finally (v) Economic Union which is a Customs Union plus common economic laws for the member countries (i.e. EU).

In trade theory, welfare effects of any RTA are analysed using two concepts: trade creation and trade diversion (see Box 1). The overall welfare effects of economic integration are ambiguous and require case-by-case judgment. The reason is that integration is both a policy of protection and a move towards free trade. The effect of the protectionist element of integration is called *trade diversion*, and the effect of the trade liberalisation element is called *trade creation*. The RTA's overall effect on welfare for a member country is determined by comparing the trade-creation and trade-diversion effects. If trade creation dominates, the formation of a RTA will enhance welfare. On the contrary, if trade diversion effect is greater than the trade creation effect, the RTA will lead to a welfare loss for the country under consideration. [4]

Box 1: Trade Creation and Trade Diversion Effects of FTA

	Country A (the home country)	Country B (the FTA member country)	Country C (rest of the world)
Supply price	50	40	30

- Case α : If A imposes a tariff of 100 percent on both B and C, only A's own producers will be in the A's domestic market.
- Case β : If A imposes a tariff of 50 percent on both B and C, only C will be the supplying country in A's market.
- Case γ : If A forms a FTA with B, but retains the 50 percent duty on C, B will be the supplying country in A.

If α was the initial condition, moving to γ will be considered as trade creation, welfare enhancing for A.

If β was the initial condition, moving to γ is an example of trade diversion with adverse consequences on welfare of A.

The fundamental arguments for regionalism rest on the evidences which suggest RTAs to be predominantly trade-creating (Rodriguez-Delgado, 2007). Krugman (1991) argued that most RTAs are likely to entail relatively low welfare losses resulting from trade diversion, since the countries involved are often geographical neighbours and hence already engage in a sizable amount of trade. It is also argued that through RTAs countries can 'lock-in' reform, which is often politically not feasible under multilateralism. Whalley (1996), for example,

[3] For a general survey of the theory of preferential trading arrangements see Panagariya (2000).
[4] Note that if member countries are the low-cost producers of the traded good, there will be no trade diversion effect and integration will unambiguously increase welfare.

asserts that a desire for increased credibility of domestic reforms was a central preoccupation behind the Mexican negotiating position on NAFTA. Also, failure or stalemate of the multilateral trade talks means trade liberalisation can only take place through RTAs. It is highlighted that countries can build on the progress of regionalism and can ultimately move toward a freer trade regime on the whole.

There are, however, some critical arguments against formation of any RTA. It is alleged that through RTA the spirit of multilateralism is undermined. It is argued that the world might be divided into a few protectionist blocs and protectionists might accept RTAs to oppose further multilateral liberalisation. Therefore, RTAs might work as stumbling block rather than building blocs for multilateralism. Also, the 'spaghetti bowl' effect can emerge because of many complicated simultaneous RTA negotiations (Bhagawati and Panagariya, 1996). RTAs also discriminate against the non-member countries, and even LDCs could seriously be discriminated against due to the RTAs among the developed and developing countries. NAFTA is a good example in this regards, and it is argued that because of NAFTA, LDC like Bangladesh has been discriminated against while Mexico has been favoured in the US market (Razzaque, 2005). Furthermore, RTAs distort resource allocation, favouring regional producers to the potential detriment of local consumers (Rodriguez-Delgado, 2007). Recent research on RTAs also emphasises the global consequences of multiple and overlapping RTAs in terms of the transaction costs they impose. It is further put forward that resources in trade ministries are limited. Therefore, too much involvement in RTA negotiations may distract attention from multilateral liberalisation.

There are also concerns that through RTA (reducing tariffs for the member countries) the prices of goods imported from the member countries in the domestic market may not fall as the member countries may see the home country's market as a 'captive market' for their exporters. For example, it is often alleged by the critics of SAFTA that through this regional trading arrangement, Indian exporters may find a 'captive market' for their exporters in Bangladesh (World Bank, 2006). As a result, even though Bangladesh reduces the tariffs for Indian products, the prices of those products may not fall in Bangladesh as the Indian exporters will have the 'freedom' to raise prices up to the level at which the products from the rest of the world are sold in Bangladesh (with higher tariffs).

In general, there are some agreements among the economists about the pre-conditions for home-country welfare expansion from a RTA. For example, the home country could gain if there are: (i) high level of the home country's tariffs prior to the agreement; (ii) high tariff level of the contemplated partner; (iii) high economic size of the partner; (iv) high share of the partner in providing the home country's imports; (v) low ratio of imports from the rest of the world to the home country's aggregate economic activity; (vi) relative prices in the partner's economy close to those of the rest of the world; and (vii) similarities in economic activities of the partner with the rest of the world.

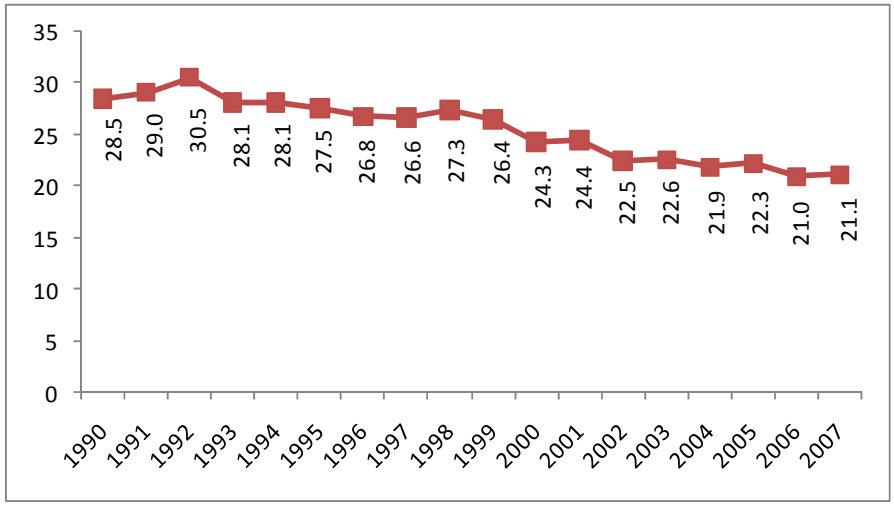
IV. Background of the Proposed EU-India FTA

Both EU and India have mutual interests in pursuing for greater cooperation in trade. The EU commission launched its new trade policy named "Global Europe – Competing in the World" with a view to connect external trade policies to EU's internal trade policies of creating a single market by an agenda of progressive liberalization and deregulation. The failure of multilateral trade talks with the stalemate of WTO actually opened the door for a new

generation of bilateral agreements on trade and investments. In order to achieve the objective of "competitiveness of European Corporations" the EU planned to aggressively advance issues which cannot be advanced in multilateral talks. Top priority of the plan was to have a hold in the potential markets and the so – called "new areas of growth". The mandates authorized the EU Commission to negotiate the new FTAs comprise of five building blocks: (1) market access for European business due to elimination of tariff and non-tariff barriers; (2) the so-called Singapore issues (investment, government procurement, competition and trade facilitation) which were rejected in Cancun by governments of the South; (3) intellectual property rights (IPR); (4) the service sector which is a stronghold of the EU economy; and (5) a reference to sustainable development including rhetoric about social and environmental standards, core labour rights and decent work. The criteria for the selection of new partners for those competitiveness-driven FTAs are: (1) market potential and size, and (2) high level of protection against EU exports and investors. India is considered as a top priority on this list. On the other hand, in line with its new export-oriented development path India also sees opening of markets as a mutual interest. It has a keen interest in access to the EU market as Europe is India's biggest market, and the top export market for its ten biggest exports. EU-India trade rose from e28 billion in 2003 to e55 billion in 2007, pushing the two to start negotiations on a bilateral trade agreement in 2007.

Figure 1 suggests that despite the fact that the share of India's exports to EU in India's total exports declined over time, its share remained well above 20 percent in 2007.

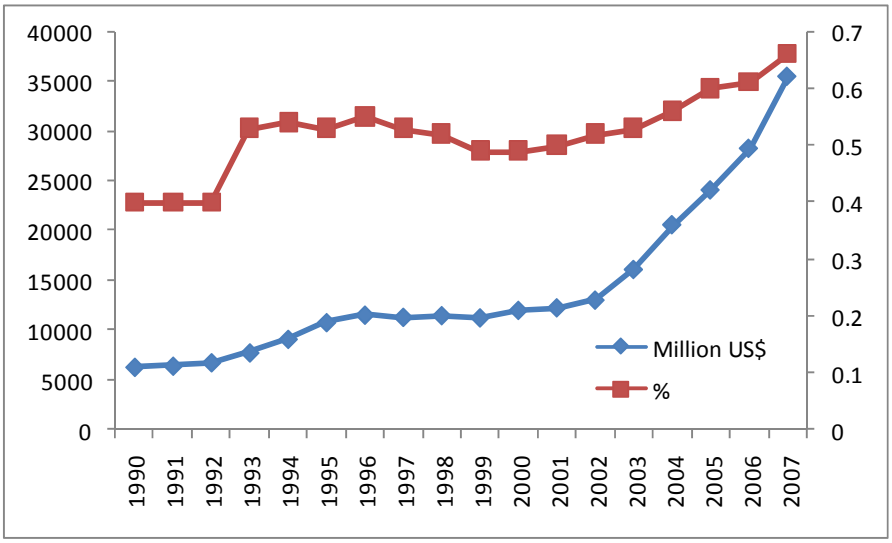
Figure 1: Share of India's Exports to EU in India's Total Exports



Source: Calculated based on data accessed from Direction of Trade CD-ROM, IMF, 2008.

It however, appears from Figure 2 that over time exports from India to EU increased quite considerably. In 1990, the export was US$ 6252 million which increased to US$ 35517 million by 2007. Also, the share of India's exports in EU's total imports increased during this period. In 1990, this share was 0.4 percent, which increased to 0.66 percent in 2007.

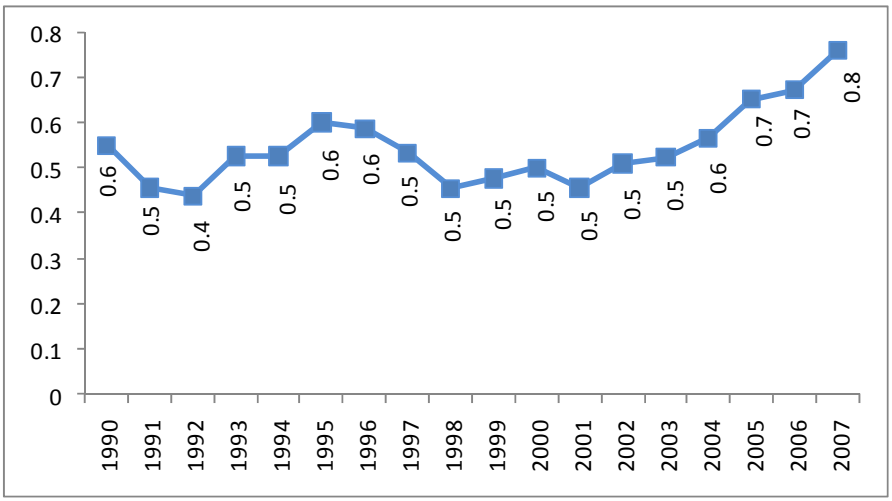
Figure 2: India's Exports to EU and the Share of India's Exports to EU in EU's Total Imports



Source: Calculated based on data accessed from Direction of Trade CD-ROM, IMF, 2008.

On the other hand, an increasing trend is observed in the case of share of EU's exports to India in EU's total exports. It is 0.06 percent in 1990, which increased to 0.08 percent in 2007.

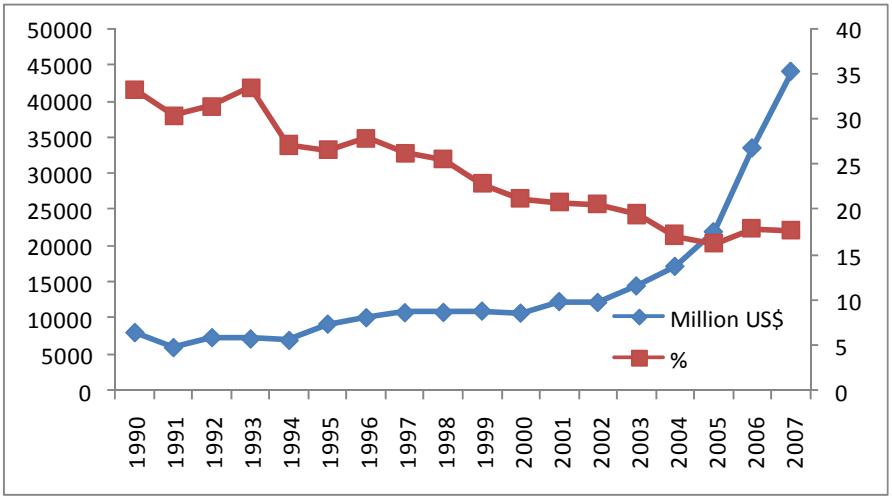
Figure 3: Share of EU's Exports to India in EU's Total Exports



Source: Calculated based on data accessed from Direction of Trade CD-ROM, IMF, 2008.

EU's exports to India increased substantially during the 2000s. In 2000 it was US$ 10690 million which increased to US$ 44020 million in 2007. However, despite the fact that the share of imports from EU in India's total imports declined over time, in 2007 the share was still as high as 17.6 percent.

Figure 4: EU's Exports to India and the Share of EU's Exports to India in India's Total Imports



Source: Calculated based on data accessed from Direction of Trade CD-ROM, IMF, 2008.

An EU-India summit was held in 2005 which generated political commitment to increase bilateral trade and economic cooperation and to tackle barriers to trade and investment between the two trading partners. A High Level Trade Group (HLTG) embodied by government representatives and business leaders was formed to explore or submit report on how to widen the bilateral trade and investment and how much was the possibility of bilateral trade and investment agreement. On October 13, 2006 HLTG submitted its report recommending the elimination of duties on 90 percent tariff lines and trade volumes within 7 years and other partial liberalization milestones.

Till 4th February 2009 five rounds of negotiations have been held. Specific areas to be covered by the FTA include trade in goods, trade in services, investments, trade facilitations, public procurement, technical regulations, intellectual property right and geographical indication (GI's), competition policy and dispute settlement.

Market access for goods remains the core component of any FTA. The EU pushed hard that both India and the EU would eliminate duties on 90 percent of tariff lines and tariff volume over a period of seven years (for India, 90 percent represents about 4,500 lines out of 5,000). However, India advocated for an asymmetrical deal by which EU would eliminate 95 percent of tariffs, leaving India at 90 percent reflecting the massively different levels of development between the parties. In the initial proposal, the EU's excluded list included 226 products, mostly chemicals, petrochemicals, plastics, ceramics and glassware. On the other hand, India proposed to have an excluded list of about 150 agricultural goods and 250 manufactured goods. The agricultural goods included processed food, dairy products, sugar, fruit and vegetables, meat products including poultry, maize, honey, mushrooms, egg products, saffron, coriander seeds, vanaspati and cocoa powder. The manufacturing goods included some textiles and clothing (i.e. woolens) textile machinery, rubber, cars, commercial vehicles and two wheelers, paper and paper board, furniture, chemicals, machinery and appliances, fish and fish products, and wines and spirits (Action Aid, 2008). However, there has not been any further agreement on this.

V. Empirical Studies on EU-India FTA

There are few studies so far on the proposed EU-India FTA. Action Aid (2008) suggests that India has average applied MFN tariffs on goods of 16 percent with very high tariff peaks (up to 160 percent) on a relatively small number of goods. This, coupled with the relatively small (25 percent, excluding petroleum products) and declining EU market share (from over 40 percent in the early 1990s) and the low overlap in production structures between the EU and India, suggests that there is considerable scope for trade diversion for India. This would imply India increasing its imports from the EU but at the expense of more efficient suppliers from third countries. For the EU, India's share in imports and exports is around 1.5 percent with some increase over the last decade. The low share of trade with the EU coupled with the low tariffs applied by the EU on Indian exports (though with a higher incidence of tariff peaks) suggest that there is little scope for trade creation, and again more likelihood of trade diversion.

Meincke (2008) indicates that far-reaching tariff elimination and liberalization of government procurement can have negative effects on the most vulnerable and marginalized groups in Indian society and hamper rather than foster human development.

Achterbosch *et al* (2008) suggest that India has little to gain and much to lose from a free trade agreement with the EU if it merely involves tariff reduction in trade with the EU.

Results from a CGE study done by Polaski et. al (2008) suggest that Indian exports would increase by $3.5 billion (5.5 percent) and India's imports would increase by $2.6 billion (3.4 percent). Because the overall increase in imports would be less than the increase in exports, India's existing bilateral trade deficit with the EU would narrow. Overall, India would experience a very small welfare loss (–$250 million). In contrast, the European Union would benefit unambiguously from the agreement, although to a very modest extent. Exports would increase by $1.3 billion, a gain of 0.05 percent of total European exports. Imports would increase by $3.2 billion (0.12 percent). Europe's existing bilateral trade surplus with India would decrease.

In a CGE study by CEPII-CIREM (2007) on a potential EU-India FTA, two scenarios have been simulated. While these are identical with regard to protection in goods (95 percent of tariffs are removed on both sides), the difference lies in the treatment of services. In the first scenario, protection in services is cut by 10 percent, while in the second scenario a 25 percent cut is considered. In both scenarios, the tariff dismantling begins in 2007 and is fully implemented in 2013, with a shorter transition period for the EU. The impact of trade liberalisation on foreign direct investment is taken into account in the simulations. EU exports to India increase in all services sectors and in both scenarios. Overall, they increase by 5 percent and 16 percent in scenarios 1 and 2, respectively (+ $US 0.5bn and + $US 1.6bn, resp.). Conversely, India increases its export of services in all sectors, in both scenarios. This emanates from the overall gain in competitiveness of the Indian economy due to a depreciation of the real exchange rate. Overall, total Indian exports of services increase by $US 0.6bn following scenario 1 and $US 1.2bn in scenario 2 (+ 3.3 percent and + 6.5 percent respectively).

The most comprehensive study so far is by Winters et al (2009), which uses a "Sussex framework" for the analysis and concludes that the dissimilarities of composition of export structures between the partners' exports to each other and excluded countries' exports to

them suggests that the scope for negative effects arising from the EU-India agreement is relatively limited. The SAARC countries are by a long way the most vulnerable to negative impacts from the FTA. Other developing countries, like Brazil, Russia and China will generally experience trade diversion rather than trade re-orientation in the EU market, especially in the manufacturing. In the Indian market, they will suffer considerable competitive pressures from the improved access for the EU, but since they trade little with India, it is not of great significance in aggregate. The ACP countries will mainly suffer from trade re-orientation as India receives preferences from the EU as deep as their own. However, the methodology adopted in this study is partial equilibrium in general and hence can't take into consideration the general equilibrium effects of this FTA deal. Also, this study doesn't attempt to estimate the welfare impacts for these countries.

VI. Structure of the Excluded Low-Income Economies

In this section we analyse the structure of exports of the countries under consideration and protection in India and EU. Understanding these structures will be a very important starting point for the examination of the potential implications of the proposed FTA for these countries. The source of information is the GTAP database version 7.

6.1. Structure of Exports

Table 1 presents the figures of the structure of exports from the low-income countries under consideration. It appears that for most of the African countries agricultural and agro-processing commodities are the main export items. Many of these countries have low shares of industries in their export earnings. In contrast, most of Asian countries, especially South Asian countries are the exporters of labour skilled manufactured products. These features of the export structure of the African and South Asian countries have been well explained by Wood and Mayer (1999) and Mayer and Wood (2000) where the authors argued that concentration of Africa's exports on unprocessed primary products is caused largely by the region's combination of low levels of education and abundant natural resources; on the other hand, the export structure of the South Asian countries is explained by their relative abundance in low-skilled labour.

Table 1: Structure of Exports (Sectoral Shares in Total Exports)

	BGD	PAK	LKA	XSA	KHM	LAO	NGA	SEN	ETH	MDG	MWI	MUS	MOZ	TZA	UGA	ZMB	BWA
Paddy rice	0.0	0.3	0.0	0.0	0.0	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Wheat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Cereal grains	0.0	0.0	0.0	0.0	0.1	0.7	0.0	0.1	0.7	0.0	0.3	0.0	0.3	1.4	0.7	1.8	0.1
Vegetables	0.2	1.0	1.1	2.3	0.4	0.8	0.1	1.9	3.3	3.7	2.6	0.1	1.6	5.1	1.7	1.6	0.0
Oil seeds	0.0	0.1	0.2	0.3	0.1	0.2	0.1	0.2	5.5	0.0	0.7	0.0	0.6	1.4	0.3	1.6	0.0
Sugar cane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0
Plant-based fibers	0.7	0.5	0.4	0.3	0.0	0.2	0.1	1.6	0.7	0.5	3.0	0.0	1.2	3.8	1.6	5.5	0.0
Crops nec	0.4	0.3	7.9	1.4	0.1	2.6	0.9	0.2	14.6	8.8	39.2	0.1	3.7	10.6	16.6	4.5	0.0
Livestock	0.0	0.0	0.0	0.1	0.1	0.3	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Animal products	0.0	0.2	0.0	0.5	0.1	0.4	0.0	0.6	2.5	0.3	0.1	0.6	0.1	1.2	0.7	0.3	0.2
Raw milk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Wool	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forestry	0.1	0.1	0.2	1.0	0.1	4.9	0.1	0.3	2.0	0.7	0.1	0.0	1.3	2.7	0.2	0.2	0.1
Fishing	0.3	0.1	0.7	1.0	0.2	0.0	0.0	3.3	0.1	0.4	0.1	0.1	0.1	0.7	0.3	0.0	0.0
Coal	0.0	0.0	0.0	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil	0.0	0.0	0.0	11.8	0.9	3.1	80.8	0.0	0.0	21.1	24.6	15.1	0.0	0.0	39.3	0.0	0.0
Gas	0.0	0.0	0.0	0.0	0.0	0.0	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minerals	0.0	0.3	1.0	0.3	0.0	0.8	0.2	2.2	0.3	1.1	0.1	0.1	0.9	6.1	0.1	3.6	65.8
Meat	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.5

	BGD	PAK	LKA	XSA	KHM	LAO	NGA	SEN	ETH	MDG	MWI	MUS	MOZ	TZA	UGA	ZMB	BWA
Meat products	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.4	0.0	0.1	0.2
Vegetable oils and fat	0.0	0.4	0.3	0.7	0.0	0.0	0.0	2.1	0.1	0.0	0.5	0.0	0.5	0.3	0.8	0.1	0.0
Dairy products	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1
Processed rice	0.0	3.7	0.1	0.4	0.3	0.8	0.0	0.7	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0
Sugar	0.1	0.8	0.0	0.5	0.0	0.0	0.0	0.1	0.7	0.6	9.4	9.3	1.0	0.8	0.1	1.7	0.0
Food products	4.0	1.6	6.5	3.6	1.4	0.8	0.4	16.1	2.4	12.1	0.3	3.5	5.7	11.9	9.6	0.9	0.7
Beverages and tobacco	0.1	0.4	0.2	0.6	0.1	0.7	0.0	1.4	0.1	0.2	0.2	0.2	0.0	1.4	0.3	0.1	0.2
Textiles	33.0	43.4	9.2	9.5	19.5	9.6	0.2	0.9	1.4	11.8	1.7	15.7	0.3	3.3	1.4	1.7	1.4
Wearing apparel	43.0	14.8	32.1	9.4	48.8	17.7	0.0	0.2	1.1	14.4	6.1	11.0	0.1	2.1	0.3	0.1	1.2
Leather products	3.4	2.5	0.6	0.6	5.0	1.0	0.6	0.5	2.4	0.3	0.0	0.4	0.0	0.4	0.1	0.4	0.1
Wood products	0.1	0.2	0.6	0.4	1.4	18.6	0.1	0.5	0.1	0.8	0.5	0.1	0.3	0.6	0.2	0.2	0.1
Paper products	0.0	0.1	0.5	0.9	0.1	0.0	0.0	0.7	0.1	2.0	1.9	0.7	0.0	0.2	0.2	0.5	0.2
Petroleum products	0.0	1.0	0.1	0.0	0.7	2.3	0.3	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Chemical rubber, plastic	1.4	2.3	7.1	4.2	2.0	0.8	0.3	20.4	0.5	0.5	1.4	2.1	0.5	1.6	1.1	2.0	1.0
Mineral product	0.3	0.5	0.8	0.1	0.0	0.0	0.0	2.1	0.5	0.0	0.1	0.3	0.0	0.8	0.2	0.6	0.0
Ferrous metals	0.2	0.3	0.3	3.2	0.2	0.3	0.0	1.6	0.1	0.2	0.1	0.2	0.5	0.4	0.9	0.3	0.1
Metals	0.1	0.4	2.0	1.3	0.0	0.2	0.2	0.8	5.8	0.1	0.2	0.1	51.9	9.5	5.0	66.4	6.4
Metal products	0.1	0.7	0.5	0.4	0.0	0.4	0.1	0.4	0.1	0.1	0.1	0.4	0.1	0.2	0.2	0.2	0.5
Motor vehicles and parts	0.3	0.2	0.2	0.0	0.4	0.1	0.0	0.8	0.0	0.0	0.2	0.6	0.1	0.1	0.3	0.1	2.7
Transport equipment	0.3	1.9	1.0	0.1	0.2	0.0	0.9	0.7	0.6	0.3	0.1	0.1	0.0	0.1	0.2	0.0	0.3
Electronic equipment	0.1	0.2	0.6	0.1	0.1	0.1	0.0	0.4	0.1	0.1	0.2	1.6	0.1	0.1	0.3	0.1	0.1
Machinery and equip	0.7	1.7	3.2	0.6	0.2	1.1	0.3	2.1	0.3	0.5	0.5	2.8	0.3	0.6	0.6	1.0	1.1
Other Manufactures	0.2	2.6	4.8	0.9	1.0	1.0	0.0	0.6	0.4	0.6	0.2	3.1	0.0	1.1	0.4	0.2	0.7
Services	10.9	17.3	17.8	42.9	16.3	29.6	8.6	34.4	51.6	18.6	5.5	31.5	28.8	30.0	15.9	4.0	15.2
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Version 7 of GTAP Database

6.2. Importance of EU and Indian Markets for Exports

Table 2 provides figures of the shares of the countries under consideration in EU's imports of different products. It appears that South Asian countries, like Bangladesh, Pakistan and Sri Lanka had some notable shares in the EU's imports of textile and wearing apparels. For example, Bangladesh had 2.8 and 2.9 percent shares of EU's imports of textile and wearing apparels. In contrast, some African countries have some reasonable shares in EU's imports of agricultural and agro-processing products. For example, Tanzania had 12.4 percent share of EU's imports of sugar. However, for most of the products, these low-income countries had either very low or negligible shares in EU's imports.

Table 2: Shares in Total Imports to EU in 2004

	BGD	PAK	LKA	XSA	KHM	LAO	NGA	SEN	ETH	MDG	MWI	MUS	MOZ	TZA	UGA	ZMB	BWA
Paddy rice	0.2	8.7	0.1	0	0	0.2	0	0	0	0	0	0	0	0.2	0	0	0
Wheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cereal grains	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.2	0	0	0
Vegetables	0	0.1	0.1	0	0	0	0	0.1	0.1	0.2	0	0	0	0.1	0	0.1	0
Oil seeds	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0
Sugar cane	0	0	0	0.1	0	0	0	0.4	0.2	0	0	0	0	12.4	0	0	0
Plant-based fibers	0.2	0.2	0.7	0	0	0.1	0	0.2	0	0.4	0	0	0.7	0.7	0.4	0	0
Crops nec	0	0	0.7	0	0	0	1.3	0	0.6	0.3	0.7	0	0.1	0.6	1	0.3	0
Livestock	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Animal products	0	0.3	0	0.1	0	0	0	0	0.3	0	0	0.1	0	0.1	0	0	0
Raw milk	0	0.9	0	0.2	0	0	0	0	0.3	0	0	0	0	0	0.8	0	0
Wool	0	0	0	1.1	0	0	0	0	0	0	0	0	0	0	0	0	0
Forestry	0	0.1	0.1	0.1	0	0	0.2	0.1	0	0.1	0	0	0	0.4	0	0	0
Fishing	0	0	0.1	0.1	0	0	0	0.9	0	0.1	0	0	0	0.1	0.1	0	0
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	0	0	0	0.2	0	0	2.4	0	0	0.1	0	0.1	0	0	0.1	0	0
Gas	0	0	0	0	0	0	4.7	0	0	0	0	0	0	0	0	0	0
Minerals	0	0	0.2	0	0	0	0	0.1	0	0	0	0	0	0.1	0	0	6.6
Meat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4

	BGD	PAK	LKA	XSA	KHM	LAO	NGA	SEN	ETH	MDG	MWI	MUS	MOZ	TZA	UGA	ZMB	BWA
Meat products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vegetable oils and fats	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0
Dairy products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Processed rice	0.1	2.1	0.1	0.5	0.6	0.2	0	0.1	0	0.1	0	0	0	0.1	0	0	0
Sugar	0.1	2.3	0	0.3	0	0	0	0	0.2	0.3	0.7	8.6	0.3	0.4	0	0.3	0
Food products	0.2	0.1	0.1	0	0	0	0.1	0.2	0	0.2	0	0.1	0.1	0.2	0.1	0	0
Beverages and tobacco	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Textiles	2.8	2.2	0.3	0.1	0.5	0.1	0	0	0	0.1	0	0.5	0	0	0	0	0
Wearing apparel	2.9	1.5	1.1	0	0.4	0.1	0	0	0	0.1	0	0.3	0	0	0	0	0
Leather products	0.4	0.4	0.1	0	0.2	0	0.4	0	0.1	0	0	0	0	0	0	0	0
Wood products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paper products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Petroleum products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chemical rubber, plastic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mineral product	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ferrous metals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Metals	0	0	0	0	0	0	0	0	0	0	0	0	1.3	0	0	0.1	0
Metal products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Motor vehicles and parts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transport equipment	0	0	0.1	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0
Electronic equipment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Machinery and equip	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Manufactures	0	0.4	0.3	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0
Services	0	0.1	0.1	0.1	0	0	0.2	0	0	0	0	0.1	0	0	0	0	0

Source: Calculated from version 7 of GTAP Database

In the Indian market, Sri Lanka and rest of South Asia had some notable shares in India's imports of a number of commodities (Table 3). Though Bangladesh had either zero or very low shares in most of the commodities, in the case of fishing it had 49 percent share of the total imports. Some African countries had some reasonable shares in agricultural, agro-processing and mineral products. For example, Nigeria had more than 28 percent share in India's imports of oil, and Tanzania had around 24 percent share in India's imports of sugarcane. However, for most of the products, these low-income countries had either very low or zero shares.

Table 3: Shares in Total Imports to India in 2004

	BGD	PAK	LKA	XSA	KHM	LAO	NGA	SEN	ETH	MDG	MWI	MUS	MOZ	TZA	UGA	ZMB	BWA
Paddy rice	0.0	0.0	0.6	3.0	0.6	3.8	0.5	0.4	0.0	0.0	0.0	0.0	0.3	3.4	0.0	0.0	0.1
Wheat	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cereal grains	0.0	0.0	0.0	7.7	0.0	0.0	0.1	0.3	1.3	0.0	0.2	0.0	0.2	6.1	0.7	0.2	0.3
Vegetables	0.1	3.0	1.2	3.6	0.0	0.0	0.9	0.5	0.2	0.2	0.4	0.0	2.5	7.2	0.0	0.0	0.0
Oil seeds	0.0	0.1	2.2	0.8	0.0	0.0	0.2	0.0	2.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0
Sugar cane	0.0	0.0	0.0	2.5	0.1	0.1	0.0	0.7	0.3	0.1	0.0	0.0	0.0	23.9	0.0	0.0	0.0
Plant-based fibers	6.3	0.1	0.1	0.0	0.0	0.0	0.4	0.6	0.1	0.3	0.0	0.5	0.3	10.4	1.8	1.0	0.0
Crops nec	0.4	1.9	13.0	9.8	0.0	0.0	0.9	0.0	0.4	0.2	0.5	0.0	0.1	1.5	0.1	0.0	0.0
Livestock	0.1	0.2	0.0	28.4	0.3	0.0	0.0	0.1	0.5	0.9	0.0	0.0	0.0	0.3	0.2	0.0	0.0
Animal products	0.2	0.0	0.1	1.2	0.0	0.0	0.2	0.0	5.9	0.0	0.0	0.0	0.0	0.6	0.4	0.0	0.0
Raw milk	0.0	1.0	0.0	0.2	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0
Wool	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forestry	0.0	0.2	0.2	1.6	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1	0.0	0.0
Fishing	49.1	0.2	2.8	0.2	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.1	0.0
Coal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil	0.0	0.0	0.0	0.0	0.0	0.0	28.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0
Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minerals	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0
Meat	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2
Meat product	0.0	0.0	1.4	1.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.6	0.0	0.0	0.5
Vegetable oils	0.0	0.1	1.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	BGD	PAK	LKA	XSA	KHM	LAO	NGA	SEN	ETH	MDG	MWI	MUS	MOZ	TZA	UGA	ZMB	BWA
Dairy products	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Processed rice	0.2	0.4	0.5	2.5	1.1	0.6	0.0	0.2	0.0	0.4	0.0	5.9	0.0	0.3	0.0	0.0	0.0
Sugar	0.1	13.6	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Food products	0.8	0.1	0.7	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Beverages and tobacco	0.1	0.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Textiles	0.8	1.0	0.4	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0
Wearing apparel	1.7	0.8	0.4	14.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0
Leather products	0.8	0.4	0.9	0.9	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Wood products	0.2	0.0	5.1	3.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Paper products	0.0	0.0	0.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Petroleum products	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chemical rubber, plastic	0.3	0.1	0.3	0.9	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mineral product	0.1	0.0	2.3	0.2	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ferrous metals	0.1	0.0	0.5	2.4	0.0	0.0	0.2	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0
Metals	0.0	0.0	1.2	0.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Metal products	0.3	0.0	1.5	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor vehicles and parts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transport equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Electronic equipment	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Machinery and equip	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Other Manufactures	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Services	0.0	0.1	0.4	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0

Source: Calculated from version 7 of GTAP Database

Figures in Table 2 and 3 may create the impression that the EU and Indian markets, by large, are not very important for the low-income countries under consideration. However, Table 4 indicates that the EU market is a very important export destination for most of the low-income countries under consideration. Among the Asian countries, the EU market accounts for as high as 54.15 percent of total Bangladesh's exports. Among the African countries, Botswana has more than 70 percent of this share. However, the Indian market is not a major export destination for most of the countries under consideration. Among the Asian countries, Rest of South Asia (comprising Nepal, Bhutan, Maldives and Afghanistan) has the highest share followed by Sri Lanka. Among the African countries, Nigeria has a reasonably high share as far as the Indian market is concerned.

Table 4: Share of Exports to India and EU in Country's Total Exports

	IND	EU
Bangladesh (BGD)	0.98	54.15
Pakistan (PAK)	0.91	32.01
Sri Lanka (LKA)	6.13	35.94
Rest of South Asia (XSA)	18.58	35.98
Cambodia (KHM)	0.15	31.42
Lao PDR (LAO)	0.20	46.29
Nigeria (NGA)	19.14	20.87
Senegal (SEN)	11.97	38.09
Ethiopia (ETH)	0.86	36.65
Madagascar (MDG)	1.33	46.99
Malawi (MWI)	1.84	34.55
Mauritius (MUS)	1.60	54.81
Mozambique (MOZ)	1.58	66.51
Tanzania (TZA)	6.19	35.36
Uganda (UGA)	2.26	36.47
Zambia (ZMB)	1.10	11.01
Botswana (BWA)	0.11	71.76

Source: Version 7 of GTAP Database

VII. Trade Similarity of Excluded Low-Income Economies with EU and India

With a view to examining the impact of EU-India FTA deal on the excluded low income economies in Asia and Africa, it is useful to explore the similarity of exports of these countries with India in the EU market and with the EU in the Indian market. One useful way of examining the trade similarity is comparison of the top 50 export products of these countries both in the EU and in the Indian market. Table 5 reports the number of commodities at the HS 4 digit level which are common in the export baskets of India and the other low income countries in the EU market as well as the number of commodities which are common in the export baskets of the EU and other low income countries in the Indian market. It seems that in the EU market, among the Asian low income economies, the maximum similarity with India appears to be with Sri Lanka; and among the African low-income economies, the maximum similarity with India is with Madagascar. However, for all other African countries, the export similarity is very low. In the Indian market, for all the low income economies the similarity with the EU is very low.

Table 5: Top 50 Export Items: Similarity with India and EU (HS 4 digit)

	EU market: similarity with India	Indian market: similarity with the EU
Bangladesh (BGD)	16	5
Pakistan (PAK)	15	6
Sri Lanka (LKA)	18	8
Rest of South Asia (XSA)	15	6
Cambodia (KHM)	09	4
Lao PDR (LAO)	07	3
Nigeria (NGA)	2	7
Senegal (SEN)	1	4
Ethiopia (ETH)	7	4
Madagascar (MDG)	16	4
Malawi (MWI)	7	5
Mauritius (MUS)	5	5
Mozambique (MOZ)	4	6
Tanzania (TZA)	8	5
Uganda (UGA)	2	4
Zambia (ZMB)	4	3
Botswana (BWA)	11	5

Source: Computed from WITS database

The above mentioned findings are also supported by the F-K index[5] constructed by Winters et al (2009). Table 6 reports the values of the index. The general conclusion is that in the EU market, the maximum similarity with India is observed for Sri Lanka, whereas in the EU market, the similarity index is very low for all the countries under consideration.

[5] The F-K index of import similarity between country m and n can be defined, in general, as $FK_{mn} = \sum_i \min(\delta_{im}, \delta_{in})$. Where δ_{im} and δ_{in} are the share of imports from country m in product i and the share of imports from country n in product i, respectively. This index was computed at the 6-digit level of disaggregation. The FK index is equal to one when the structure of trade (defined by the share of each sector in total trade) across the two countries being compared is identical and is equal to zero when the structure of trade is completely different.

Table 6: Similarity of Composition in Trading Structures

	EU market: similarity with India			Indian market: similarity with the EU		
	1	2	3	1	2	3
Bangladesh	0.179	0.173	0.000	0.020	0.020	0.020
Nepal	0.138	0.126	0.000	0.033	0.033	0.033
Pakistan	0.259	0.241	0.200	0.031	0.031	0.031
Sri Lanka	0.269	0.180	0.152	0.072	0.072	0.072
CARICOM	0.101	0.074	0.001	0.029	0.029	0.029
Central Africa	0.037	0.018	0.000	0.043	0.043	0.043
Eastern and Southern Africa	0.182	0.140	0.001	0.047	0.046	0.046
Pacific- EPA	0.031	0.013	0.002	0.010	0.010	0.010
SADA (less South Africa)	0.044	0.023	0.001	0.025	0.025	0.025
West Africa	0.056	0.034	0.001	0.031	0.031	0.031

Note: (1) Similarity across all products; (2) Similarity across products in which India (EU) has +ve tariffs; (3) Where exports present from both suppliers and both have +ve tariffs
Source: Winters et al (2009)

The aforementioned discussions points to the possibility of a low impact on the excluded low-income economies because of the low trade similarity in both the EU and the Indian market. However, it should be kept in mind that the impacts on the excluded economies don't entirely depend on the similarity of trade of these countries with the FTA partners, since many of these countries also enjoy significant preferences in the EU and the Indian market. Such an FTA risks the loss in preferences for these countries. The next section discusses the margin of preferences of the excluded low-income countries in the EU and Indian markets.

VIII. Margin of Preferences in the EU and Indian Market

The GTAP database provides the benchmark level and structure of protection in the EU and India which is useful to understand the initial conditions from which the tariff liberalisation aspects of the FTA would have to be assessed. Most of the low-income economies enjoy some preferences in the EU and Indian market and their margins of preferences for various products can be calculated from the GTAP database. Table 8 shows the calculated margins of preferences, where the positive figures refer to the existence of preferences. It can be seen from Table 7 that, there are some significant margin of preferences for these low-income countries in the EU market compared to the tariff rates imposed on imports from India. For the Asian countries, the margins of preference on textile and clothing, their major export items to EU, are very important. For the African countries, however, the margins of preference on agricultural and agro-recessing are very relevant.

Table 7: Margin of Preference in the EU Market compared to the Tariff rates on Indian Products (percentage point difference)

	BGD	PAK	LKA	XSA	KHM	LAO	NGA	SEN	ETH	MDG	MWI	MUS	MOZ	TZA	UGA	ZMB	BWA
Paddy rice	0	9	9	58.9	46.9	44.9	58.9	48.9	58.9	39.3	58.9	58.9	58.9	58.9	58.9	58.9	58.9
Wheat	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
Cereal grains	19.9	18	19.9	19.9	19.9	19.9	19.1	19.9	19.9	19.9	19.9	-8.2	19.9	19.9	19.9	19.9	19.9
Vegetables	0.9	0.5	0	0.9	0.9	0.2	0	0.9	0.9	0.6	0.9	-6.8	0.9	0.9	-0.5	0.9	0.9
Oil seeds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sugar cane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plant-based fibers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crops nec	1.6	1.6	0	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Livestock	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
Animal products	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Raw milk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wool	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	BGD	PAK	LKA	XSA	KHM	LAO	NGA	SEN	ETH	MDG	MWI	MUS	MOZ	TZA	UGA	ZMB	BWA
Forestry	1	1	0.6	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fishing	3.5	3.5	0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minerals	0	-0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meat	254.3	234.4	254.3	254.3	254.3	254.3	254.3	254.3	254.3	254.3	254.3	183.7	254.3	254.3	254.3	254.3	176.2
Meat products	17.7	0	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	5.8
Vegetable oils and fat	1.7	0.9	0	1.7	1.7	1.7	1.6	1.7	1.7	1.7	1.7	-0.1	1.7	1.7	1.7	1.7	1.7
Dairy products	20.2	0	0	20.2	20.2	20.2	-89.3	20.2	20.2	20.2	20.2	-20.6	20.2	20.2	20.2	20.2	20.2
Processed rice	59.4	0	0	109.3	44.6	62.3	109.3	105.3	0	72.2	-28.9	-6.5	109.3	109.3	109.3	109.3	109.3
Sugar	0	27.2	0	0	34	34	34	33	0	0	0	0	0	0	18.8	0	34
Food products	6.8	4.3	1.1	6.8	6.8	6.8	6.7	6.8	6.8	6.8	6.8	5.8	6.8	6.8	6.8	6.8	2.1
Beverages and tobacco	19.8	19.8	0	19.8	19.8	19.8	18.1	19.8	19.8	19.8	19.8	16.2	19.8	19.8	19.8	19.8	19.8
Textiles	7.4	3.7	0	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
Wearing apparel	8.6	7.5	0	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
Leather products	3.4	1.1	0	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Wood products	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Paper products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Petroleum products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chemical rubber, plastic	0.6	0.6	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Mineral product	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ferrous metals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Metals	1.7	1.5	1.5	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Metal products	0.2	0.2	0	0.2	-0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Motor vehicles and parts	4.1	4.1	3.7	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Transport equipment	0.7	0.7	0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Electronic equipment	1.1	1.1	0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Machinery and equip	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Manufactures	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: Positive figures indicate preference
Source: Calculated from version 7 of GTAP Database

Table 8 shows the calculated margins of preferences for the low-income economies in the Indian market compared to the tariff rates on imports from the EU. Among the Asian countries, Sri Lanka and rest of South Asia enjoy some significant preferences over EU in the Indian market. Some African countries also have some preferences in the agricultural and agro-processing products.

Table 8: Margin of Preference in the Indian Market compared to the Tariff rates on EU Products (percentage point difference)

	BGD	PAK	LKA	XSA	KHM	LAO	NGA	SEN	ETH	MDG	MWI	MUS	MOZ	TZA	UGA	ZMB	BWA
Paddy rice	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Wheat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cereal grains	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	-74.3	5.1	5.1	5.1
Vegetables	0	11.9	0	6.1	43.8	43.8	13.6	13.8	13.4	11.8	3	13.8	13.2	12.9	43.8	43.8	43.8
Oil seeds	16.2	0	0	16.2	16.2	16.2	-13.8	16.2	-13.8	16.2	16.2	-13.8	16.2	-13.8	16.2	16.2	16.2
Sugar cane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plant-based fibers	0	3.1	0	13.1	13.1	13.1	3.1	3.1	3.1	2.6	3.1	3.1	3.1	2.9	3.1	3.1	13.1
Crops nec	0	0	0	24.1	27.2	27.2	-2	27.2	-7.3	-41.4	-68.1	-34.6	-72.8	-40.4	-64.6	27.2	27.2
Livestock	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Animal products	0	2.7	0	1.9	2.7	2.7	1	2.7	2.7	2.7	2.7	2.7	2.7	-1.1	2.7	-0.4	-16.7
Raw milk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wool	15	0	15	0	15	15	15	15	15	15	15	15	15	15	15	15	15
Forestry	0	5.6	5.6	0	5.8	0	4.2	-19.2	-19.2	-8.8	10.8	5.8	5.8	4.4	5.8	10.8	10.8
Fishing	25.9	0	0	11.7	26.2	26.2	26.2	-3.8	26.2	26.2	26.2	26.2	26.2	-3.8	26.2	5.1	26.2
Coal	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Oil	0	0	0	0	0	0	-10	0	0	0	0	0	0	0	0	0	0

	BGD	PAK	LKA	XSA	KHM	LAO	NGA	SEN	ETH	MDG	MWI	MUS	MOZ	TZA	UGA	ZMB	BWA
Gas	0	0	0	0	0	0	-10	0	0	0	0	0	0	0	0	0	0
Minerals	1	0.8	5.6	12.8	15	15	5.5	10	0	0	0	0	0	0	0	0	15
Meat	17.8	17.8	17.8	0	17.8	17.8	17.8	17.8	-11.7	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8
Meat products	39.3	39.3	0	0	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3
Vegetable oils and fats	19.2	42.6	32.8	36.9	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	42.6	72.6	72.6	72.6
Dairy products	6.7	0	5.8	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	-22.3	36.7	36.7	36.7	36.7	36.7
Processed rice	57.3	0	57.3	57.3	57.3	57.3	57.3	57.3	57.3	57.3	57.3	-12.7	57.3	57.3	57.3	57.3	57.3
Sugar	35.4	35.4	35.4	20.9	50.4	50.4	50.4	50.4	50.4	50.4	50.4	50.4	50.4	35.4	50.4	50.4	50.4
Food products	13.6	4.8	0	11.6	38.7	38.7	38.7	8.7	5.8	38.7	38.7	-19.7	38.7	8.7	8.7	38.7	38.7
Beverages and tobacco	107.2	76.5	13.9	99.7	137.2	137.2	-18.1	137.2	137.2	137.2	137.2	37.2	137.2	137.2	137.2	137.2	137.2
Textiles	1.2	0	0.7	14.6	0.7	15.7	0.7	-13.9	-14.3	-10.8	0.7	0.7	15.7	-8.6	0.7	15.7	15.7
Wearing apparel	0	0	0	14.7	0	14.7	14.7	14.7	-0.3	14.7	14.7	-0.3	14.7	-0.3	14.7	14.7	14.7
Leather products	2.5	1.1	0	13.8	3.4	13.8	1.9	8.8	2.3	13.8	13.8	-1.2	13.8	5.2	2.3	13.8	-1.2
Wood products	0	0.4	0.1	7.9	15	15	3.4	15	0.4	0	0	0	15	4.2	0	15	15
Paper products	0	0	0	13.6	0	14.4	1.6	-0.6	10.4	-0.6	-0.6	-0.5	14.4	9	14.4	-0.6	1.1
Petroleum products	0	0	0	14.5	14.5	14.5	4.5	14.5	14.5	14.5	14.5	-0.5	14.5	14.5	14.5	14.5	14.5
Chemical rubber, plastic	5.8	0.1	0.1	11.2	0.2	0.2	0.2	0.3	-13.9	-10	0.2	0.2	0.2	0	0.2	15.2	-0.2
Mineral product	5.8	0	1.4	12	15	15	15	0	0	15	0	0	15	0	15	0	15
Ferrous metals	0	0	0	13.1	0	0	-0.9	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-0.8	-1.1	-1.1	2.7
Metals	0	0	0	9.8	0	15	0	0	0	15	15	0	0	0	0	0	15
Metal products	0	0	0	15	0	15	0	0	0	0	0	0	15	0	0	0	15
Motor vehicles and parts	0	15.6	0	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	-44.3	30.6	30.6	-3.6	30.6	30.6
Transport equipment	0	0	0	7.6	7.6	7.6	3.5	7.6	7.6	7.6	7.6	-4	7.6	-6.9	7.6	7.6	7.6
Electronic equipment	0	3.6	0.8	4.4	4.4	4.4	2.6	4.4	4.4	4.4	3.4	-3.9	4.4	4.4	-0.8	4.4	4.4
Machinery and equip	0	0	0	14.1	0	14.2	0	0	0	14.2	-0.8	-0.3	14.2	-0.8	-0.8	-0.8	-0.8
Other Manufactures	0	0	0.2	7.7	0	0	0	0	0	0	0	0	15	0	0	0	0
Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: Positive figures indicate preference
Source: Calculated from version 7 of GTAP Database

It should, however, be mentioned that despite some notable preferences, most of the Asian and African countries (except, rest of South Asia and Sri Lanka) have very low imports into India. Therefore, even the loss in preferences is unlikely to result in large loss in exports into the Indian market from these countries.

IX. The GTAP Model

The GTAP model is a comparative static model, and is based on neoclassical theories.[1] The GTAP model is a linearised model, and it uses a common global database for the CGE analysis. The model assumes perfect competition in all markets, constant returns to scale in all production and trade activities, and profit and utility maximising behaviour of firms and households respectively. The model is solved using the software GEMPACK (Harrison and Pearson, 1996).

9.1. Household Income and Expenditure

In the GTAP model each region has a single representative household, termed as the regional household. The income of the regional household is generated through factor payments and tax revenues (including export and import taxes) net of subsidies. The regional household allocates expenditure over private household expenditure, government expenditure and

[1] Full documentation of the GTAP model and the database can be found in Hertel (1997) and also in Dimaranan and McDougall (2002).

savings according to a Cobb Douglas per capita utility function.[2] Thus each component of final demand maintains a constant share of total regional income.

The private household buys commodity bundles to maximise utility subject to its expenditure constraint. The constrained optimising behaviour of the private household is represented in the GTAP model by a Constant Difference of Elasticity (CDE) expenditure function. The private household spends its income on consumption of both domestic and imported commodities and pays taxes. The consumption bundles are Constant Elasticity of Substitution (CES) aggregates of domestic and imported goods, where the imported goods are also CES aggregates of imports from different regions. Taxes paid by the private household cover commodity taxes for domestically produced and imported goods and the income tax net of subsidies.

9.2. The Government Consumption

The government also spends its income on domestic and imported commodities and also pays taxes. For the government, taxes consist of commodity taxes for domestically produced and imported commodities. Like the private household, government consumption is a CES composition of domestically produced goods and imports.

9.3. Savings and Investment

The GTAP model considers the demand for investment in a particular region as savings driven. In the multi country setting the model is closed by assuming that regional savings are homogenous and contribute to a global pool of savings (global savings). This is then allocated among regions for investment in response to the changes in the expected rates of return in different regions. If all other markets in the multi regional model are in equilibrium, if all firms earn zero profits, and if all households are on their budget constraint, such a treatment of savings and investment will lead to a situation where global investment must equal global savings, and Walras' Law will be satisfied.

9.4. Producers' Income

In the GTAP model, producers receive payments for selling consumption goods and intermediate inputs both in the domestic market and to the rest of the world. Under the zero profit assumption employed in the model, these revenues must be precisely exhausted by spending on domestic intermediate inputs, imported intermediate inputs, factor income and taxes paid to regional household (taxes on both domestic and imported intermediate inputs and production taxes net of subsidies).

9.5 Production Technology

The GTAP model considers a nested production technology with the assumption that every industry produces a single output, and constant returns to scale prevail in all markets. Industries have a Leontief production technology to produce their outputs. Industries maximise profits by choosing two broad categories of inputs namely, a composite of factors (value added) and a composite of intermediate inputs. The factor composite is a CES function

[2] Savings enter in the static utility function as a proxy for future consumption.

of labour, capital, land and natural resources. The intermediate composite is a Leontief function of material inputs, which are in turn a CES composition of domestically produced goods and imports. Imports are sourced from all regions.

9.6. International Trade

The GTAP model employs the Armington assumption which provides the possibility to distinguish imports by their origin and explains intra-industry trade of similar products. Following the Armington approach import shares of different regions depend on relative prices and the substitution elasticity between domestically and imported commodities.

9.7. Base Data and Base Year Adjustments

Version 7 has 2004 as the base year, updated national, economic and trade data, and more importantly protection data from a new source.[8] The new GTAP database has lower tariffs than the earlier versions as a result of the reform efforts until 2004 and the inclusion of bilateral trade preferences. The GTAP database has been further adjusted to incorporate the phasing out of the Multi Fibre Agreement (MFA) in 2005 and few bilateral and multilateral trade agreements

9.8. Region and Commodity Aggregation

Data on regions and commodities are aggregated to meet the objectives of this study. The version 7 of GTAP database covers 57 commodities, 113 regions/countries, and 5 factors of production. The current study has aggregated 57 commodities into 43, and 113 regions into 23 as shown in Table 9 and 10 respectively below.

Table 9: Commodity Aggregation in the GTAP model

No	Code	Sector Description	Comprising Old Sectors
1	Pdr	Paddy rice	Paddy rice.
2	Wht	Wheat	Wheat.
3	Gro	Cereal grains nec	Cereal grains nec.
4	v_f	Vegetables, fruit, nuts	Vegetables, fruit, nuts.
5	Osd	Oil seeds	Oil seeds.
6	c_b	Sugar cane, sugar beet	Sugar cane, sugar beet.
7	Pfb	Plant-based fibers	Plant-based fibers.
8	Ocr	Crops nec	Crops nec.
9	Ctl	Cattle, sheep, goats, horses	Cattle, sheep, goats, horses.
10	Oap	Animal products nec	Animal products nec.
11	Rmk	Raw milk	Raw milk.
12	Wol	Wool, silk-worm cocoons	Wool, silk-worm cocoons.
13	Frs	Forestry	Forestry.
14	Fsh	Fishing	Fishing.
15	Coa	Coal	Coal.
16	Oil	Oil	Oil.
17	Gas	Gas	Gas.
18	Omn	Minerals nec	Minerals nec.
19	Cmt	Meat: cattle, sheep, goats, horse	Meat: cattle, sheep, goats, horse.
20	Omt	Meat products nec	Meat products nec.

[3] The source of the new protection data is the MAcMaps, a product of the joint CEPII (Paris)/ITC(Geneva) project, which has a detailed database on bilateral tariff protection that integrates trade preferences, specific tariffs and a partial evaluation of non-tariff barriers (NTBs).

No	Code	Sector Description	Comprising Old Sectors
21	Vol	Vegetable oils and fats	Vegetable oils and fats.
22	Mil	Dairy products	Dairy products.
23	Pcr	Processed rice	Processed rice.
24	Sgr	Sugar	Sugar.
25	Ofd	Food products nec	Food products nec.
26	b_t	Beverages and tobacco products	Beverages and tobacco products.
27	Tex	Textiles	Textiles.
28	Wap	Wearing apparel	Wearing apparel.
29	Lea	Leather products	Leather products.
30	Lum	Wood products	Wood products.
31	Ppp	Paper products, publishing	Paper products, publishing.
32	p_c	Petroleum, coal products	Petroleum, coal products.
33	Crp	Chemical, rubber, plastic prods	Chemical, rubber, plastic prods.
34	Nmm	Mineral products nec	Mineral products nec.
35	i_s	Ferrous metals	Ferrous metals.
36	Nfm	Metals nec	Metals nec.
37	Fmp	Metal products	Metal products.
38	Mvh	Motor vehicles and parts	Motor vehicles and parts.
39	Otn	Transport equipment nec	Transport equipment nec.
40	Ele	Electronic equipment	Electronic equipment.
41	Ome	Machinery and equipment nec	Machinery and equipment nec.
42	Omf	Other Manufactures nec	Other Manufactures nec.
43	Serv	Services	Electricity; Gas manufacture, distribution; Water; Construction; Trade; Transport nec; Sea transport; Air transport; Communication; Financial services nec; Insurance; Business services nec; Recreation and other services; PubAdmin/Defence/Health/Education; Dwellings.

Table 10: Region aggregation in the GTAP Model

No	Code	Region Description	Comprising old regions
1	IND	India	India
2	EU_25	European Union 25	Austria; Belgium; Cyprus; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Latvia; Lithuania; Luxembourg; Malta; Netherlands; Poland; Portugal; Slovakia; Slovenia; Spain; Sweden; United Kingdom.
3	BGD	Bangladesh	Bangladesh.
4	PAK	Pakistan	Pakistan.
5	LKA	Sri Lanka	Sri Lanka.
6	XSA	Rest of South Asia	Rest of South Asia.
7	KHM	Cambodia	Cambodia.
8	LAO	Lao PDR	Lao People's Democratic Republic
9	NGA	Nigeria	Nigeria.
10	SEN	Senegal	Senegal.
11	ETH	Ethiopia	Ethiopia.
12	MDG	Madagascar	Madagascar.
13	MWI	Malawi	Malawi.
14	MUS	Mauritius	Mauritius.
15	MOZ	Mozambique	Mozambique.
16	TZA	Tanzania	Tanzania.
17	UGA	Uganda	Uganda.
18	ZMB	Zambia	Zambia.
19	BWA	Botswana	Botswana.
20	BRA	Brazil	Brazil.
21	CHN	China	China.
22	USA	USA	United States of America.
23	ROW	Rest of World	Australia; New Zealand; Rest of Oceania; Hong Kong; Japan; Korea; Taiwan; Rest of East Asia; Indonesia; Myanmar; Malaysia; Philippines; Singapore; Thailand; Viet Nam; Rest of Southeast Asia; Canada; Mexico; Rest of North America; Argentina; Bolivia; Chile; Colombia; Ecuador; Paraguay; Peru; Uruguay; Venezuela; Rest of South America; Costa Rica; Guatemala; Nicaragua; Panama; Rest of Central America; Caribbean; Switzerland; Norway; Rest of EFTA; Albania; Bulgaria; Belarus; Croatia; Romania; Russian

No	Code	Region Description	Comprising old regions
			Federation; Ukraine; Rest of Eastern Europe; Rest of Europe; Kazakhstan; Kyrgyzstan; Rest of Former Soviet Union; Armenia; Azerbaijan; Georgia; Iran Islamic Republic of; Turkey; Rest of Western Asia; Egypt; Morocco; Tunisia; Rest of North Africa; Rest of Western Africa; Central Africa; South Central Africa; Zimbabwe; Rest of Eastern Africa; South Africa; Rest of South African Customs .

X. Simulation and Results

A scenario of a full FTA between EU and India is simulated using the GTAP model. Under this scenario all tariffs on the imports from EU to India are reduced to zero and all tariffs on the imports from India to EU are also reduced to zero.

10.1. Welfare Effects

The welfare effects of the simulation for the countries/regions concerned are presented in Table 11. It appears that the in terms of absolute value, maximum welfare gain is attained by the EU followed by India. However, in terms of share in GDP India's welfare gain is much higher than EU's. All the low low-income economies in Asia and Africa under consideration would experience welfare loss. In terms of absolute value, Bangladesh would incur the maximum welfare loss, almost 84 million US$, which is 0.15 percent of her GDP. However, in terms of share in GDP, the rest of South Asia would experience the largest loss in welfare, which is equivalent to 0.5 percent. It appears that in Asia, the welfare losses of the South Asian countries are much higher than those of Cambodia and Lao PDR. This is mainly because of low trade similarity of Cambodia and Lao PDR with India and EU in the EU and Indian market respectively (as mentioned in Table 5). Among the African low income economies Nigeria would experience largest welfare loss in absolute value and Senegal would experience largest welfare loss in terms of share in GDP. In general, it however appears that the welfare losses of most of these low-income economies are not very high.

Table 11: Welfare Results (Million US$)

Countries/Regions	Allocative efficiency effect	Terms of Trade Effects	Investment-Savings effect	Total Welfare Effect	% of GDP
India	-941.4	5533.7	1070.4	5662.6	0.88
European Union 25	14082.8	-2782.2	-304.2	10996.4	0.09
Bangladesh	-23	-57.2	-3.7	-83.9	-0.15
Pakistan	-7.8	-32.1	-3.7	-43.6	-0.06
Sri Lanka	-9.6	-56.5	-2.2	-68.3	-0.34
Rest of South Asia	-23.3	-41.4	-5	-69.7	-0.50
Cambodia	-0.4	-1.4	-0.6	-2.0	-0.02
Lao PDR	0	-0.3	-0.5	-0.8	-0.03
Nigeria	-9.8	-28.3	-8.3	-46.4	-0.07
Senegal	-8.2	-12.5	-5.3	-26.0	-0.36
Ethiopia	-1.3	-1.7	-0.3	-3.3	-0.05
Madagascar	0	-1.9	0	-1.9	-0.04
Malawi	-1	-2.9	0.2	-3.7	-0.21
Mauritius	-2.9	-8.4	-0.1	-11.4	-0.19
Mozambique	-0.6	-2.5	-0.1	-3.2	-0.05
Tanzania	-1.8	-7	0.5	-8.3	-0.07
Uganda	-0.2	-3.8	-0.3	-4.3	-0.06
Zambia	-0.3	-1.7	-0.1	-2.1	-0.04
Botswana	-0.1	-8.5	0.9	-7.6	-0.09

Source: Simulation Results

The decomposition of the welfare effects, presented in Table 11, suggests that India's gain from the FTA is primarily driven by terms of trade gain, whereas for the EU the gain is mainly due to the rise in allocative efficiency. India would incur loss in allocative efficiency because of the loss in tariff revenue. India's terms of trade gain is because of the rise in the prices of her export items relative to the prices of imports out of this FTA. However, EU, because of elimination of tariff protection on many of her inefficient production process (especially the agricultural products), would experience large gains in allocative efficiency as resources will divert from the inefficient sectors to the more efficient sectors. The low income economies in Asia and Africa under consideration would suffer from both losses in allocative efficiency and negative terms of trade shock. However, for all these countries, negative terms of trade shocks are the dominant factor behind welfare loss.

10.2. Macroeconomic Effects

Table 12 presents the impact on some macroeconomic variables for the countries under consideration. It seems that India would experience a fall in real GDP by 0.15 percent from the base run. This is due to the larger increase in imports compared to exports. India's imports would rise by 10.8 percent compared to a small rise in exports by only 1.08 percent. On the other hand, EU would experience a rise in real GDP by 0.11 percent and its imports and exports would rise by 0.28 percent and 0.43 percent respectively. This suggests that the EU-India FTA would result in greater market access for EU in India compared to India's market access in EU.

Table 12: Macroeconomic Impacts

Countries/Regions	Real GDP (% change from the base run)	Import (% change from the base run)	Export (% change from the base run)
India	-0.15	10.79	1.08
European Union 25	0.11	0.28	0.43
Bangladesh	-0.04	-0.38	-0.91
Pakistan	-0.04	-0.01	-0.66
Sri Lanka	-0.05	-0.10	-0.90
Rest of South Asia	-0.17	-0.10	-1.32
Cambodia	-0.01	-0.02	-0.08
Lao PDR	0.00	-0.09	-0.02
Nigeria	-0.01	-0.01	-0.12
Senegal	-0.11	-0.95	-0.77
Ethiopia	-0.02	-0.10	-0.08
Madagascar	0.00	-0.01	-0.11
Malawi	-0.05	-0.21	-0.49
Mauritius	-0.05	-0.19	-0.54
Mozambique	-0.01	-0.09	-0.09
Tanzania	-0.02	0.00	-0.23
Uganda	0.00	-0.14	-0.14
Zambia	0.00	-0.06	-0.08
Botswana	0.00	-0.01	-0.24

Source: Simulation Results

The macroeconomic impacts on other low-income countries are also reported in Table 12. Bangladesh, Sri Lanka, rest of South Asia, Cambodia, Nigeria, Senegal, Ethiopia, Malawi, Mauritius, Mozambique and Tanzania would experience fall in real GDP whereas other low-income economies would experience no impact on their real GDP. Among the Asian countries, rest of South Asia would incur a loss in real GDP by 0.17 percent. Among the African countries, the largest fall in real GDP would be experienced by Senegal. It also appears that all these low income economies would face loss in exports. The loss in exports for Bangladesh and Sri Lanka would be as high as 0.9 percent of their total exports. The corresponding figure for the rest of South Asia is 1.32 percent. Cambodia and Lao PDR however, experience very low figures of loss in exports. Among the African countries, the largest fall in exports would be faced by Senegal.

10.3. Loss in Exports in the EU and Indian Markets

From the GTAP simulation results it is also possible to isolate the loss in the exports of the low-income economies in the EU and the Indian market. It should be noted here that the loss in exports by these countries would be driven by loss in preferences of these countries in EU and India as well as due to diversion of trade in EU and India because of the FTA deal. It appears that the patterns on impacts on the low-income economies as far as the export losses in the EU and Indian markets are concerned. In South Asia, Bangladesh and Pakistan would experience bulk of their losses in the EU market, whereas, Sri Lanka and rest of South Asia would incur major losses in the Indian market. Cambodia and Lao PDR would experience virtually no loss in exports in the Indian market. Among the African countries only Nigeria and Senegal would face larger export loss in the Indian market. However, for most of the other African countries, the losses in exports in the EU market are higher than those in the Indian market.

Table 13: Loss in Exports (million US$)

	EU Market	Indian Market	Total
Bangladesh	-56.3	-7.5	-63.8
Pakistan	-79.2	-2.7	-81.9
Sri Lanka	-10.1	-55.3	-65.4
Rest of South Asia	-2.8	-47.0	-49.8
Cambodia	-12.4	0	-12.4
Lao PDR	-2.2	0	-2.2
Nigeria	-3.6	-14.1	-17.7
Senegal	-0.7	-21.6	-22.3
Ethiopia	-1.8	-0.5	-2.3
Madagascar	-5.0	-0.6	-5.6
Malawi	-1.1	0	-1.1
Mauritius	-16.0	-3.9	-19.9
Mozambique	-1.3	-0.8	-2.1
Tanzania	-6.9	-3.4	-10.3
Uganda	-1.5	-0.2	-1.7
Zambia	-0.9	-3.1	-4.0
Botswana	-40.6	-0.1	-40.7

Source: Simulation Results

Table 14 reports the losses in the exports in major commodities in the EU market by these low-income economies. It is very evident that for Bangladesh, textile and wearing apparels are the two dominant products which suffer from loss exports in the EU market. For Pakistan, paddy and processed rice as well as textile and wearing apparels would constitute the bulk of

the loss in exports. For the African countries, mainly the agricultural and agro-processing commodities would experience loss in exports.

Table 14: Loss in Exports of Major Commodities in the EU (Million US$)

	Paddy Rice	Crops	Meat	Processed rice	Sugar	Food products	Textile	Wearing apparels	Leather products
Bangladesh	-1.0	-0.1		-0.3		-0.9	-21.8	-23.4	-0.5
Pakistan	-35.1			-8.8	-0.5		-18.5	-10.7	
Sri Lanka	-0.2	-0.5		-0.8				-4.1	
Rest of South Asia				-2.6					
Cambodia	-0.2		-0.4	-3			-4.8	-4.1	
Lao PDR	-0.9		-0.3	-1			-0.1	-0.4	
Nigeria	-0.1	-1.1	0	0		-0.2	-0.4		-0.6
Senegal	-0.1		-0.3	-0.3					
Ethiopia		-0.5	-0.2		-0.1		-0.1	-0.1	
Madagascar		-0.1	-0.1	-0.7	-0.1	-0.2	-1	-1	
Malawi		-0.6			-0.1				
Mauritius			-0.3		-0.6	-0.1	-8.3	-3.4	
Mozambique	-0.1	-0.2	-0.1		-0.1	-0.2			
Tanzania	-0.8	-0.6	-1.4	-0.4	-0.1	-0.8	-0.1	-0.2	
Uganda		-0.6	-0.1			-0.2			
Botswana			-34.6						

Source: Simulation Results

Table 15, on the other hand, lists the major products of the low-income economies which would suffer from export losses in the Indian market. Bangladesh would inure some notable export loss in the case of chemicals, rubber and plastic products. Sri Lank and rest of South Asia would however, experience losses in exports in a number of mineral and manufacturing commodities. For Sri Lanka the largest loss would be in the case of exports of metals. For Nigeria, some notable loss would be in the case of exports of oil. Senegal would experience loss in exports of chemicals, rubber and plastic products. For other African countries, the figures of the losses in exports in the Indian market are minimal.

Table 15: Loss in Exports of Major Commodities in India (Million US$)

	Oil	Minerals	Food products	Beverage and tobacco products	Wood product	Paper products	Chemical, rubber and plastics	Mineral products	Ferrous metal	Metals	Metal products	Machinery
Bangladesh			-0.2	-0.1	-0.1		-5.2	-0.1	-0.3	-0.2	-0.6	-0.3
Pakistan		-0.2				-0.1	-1.5		-0.1			-0.4
Sri Lanka		-0.1	-0.2		-2.6	-1.5	-5	-3.2	-3.2	-22.1	-2.6	-15.3
Rest of South Asia		-1	-1.3	-2.9	-1.6	-1.1	-14.1	-0.3	-15.4	-4.5	-1.2	-1.8
Nigeria	-13.5	-0.4							-1.5	-1.2		-0.2
Senegal		-0.3					-20.9		-0.4			
Mauritius	-0.1	-0.1				-0.1	-0.1		-0.7			-2.7
Tanzania		-1.9	-0.1		-0.1	-0.1	-0.5		-0.5			-0.1
Zambia		-2.4							-0.1	-0.6		

Source: Simulation Results

XI. Conclusion

This paper provides an analysis on and insights into welfare, macroeconomic and trade impacts on a number of low-income economies as a result of a proposed bilateral FTA deal between the EU and India. A global general equilibrium modelling technique is applied for the analysis. A simulation of a scenario depicting a full FTA between India and EU is conducted. A summary of the simulation results is as follows:

- The EU-India FTA would result in welfare gains for both India and the EU. In absolute terms, the gains of EU would be much higher than that of India. However, in terms of share in GDP the gains of India would be much large than that of EU. India's welfare gain is mainly driven by the gain in terms of trade, whereas, EU's welfare gain is primarily because of gain in allocative efficiency.

- All the low-income economies under consideration would experience loss in welfare, and the welfare losses for the South Asian countries are much higher than the other low income economies in Asia and Africa. Bangladesh would appear to experience largest loss in welfare in absolute value, whereas rest of South Asia would incur largest loss in terms of share in GDP. The welfare losses of these low-income economies are mainly driven by the loss in terms of trade. However, in general, the extents of welfare loss in terms of share in their GDP for most of these countries are not very high.

- Most of these low-income countries would also experience loss in real GDP and loss in exports. For rest of South Asia, the loss in real GDP is as high as 0.17 percent and loss in exports is as high as 1.32 percent. Other South Asian countries like Bangladesh and Sri Lanka would also experience loss in exports by more than 0.9 percent. However, for most of the other countries, the loss in real GDP and loss in exports are not very large.

- Most of the low income countries under consideration would experience fall in exports both in the EU and Indian market mainly because of loss in preferences and diversion of trade in the EU and Indian market. However, the pattern of export loss is different for different countries. Countries like Bangladesh and Pakistan would suffer from larger export losses in the EU market compared to the Indian market whereas for Sri Lanka and rest of South Asia the impacts will be just the opposite. Most of the other low-income countries would however experience larger loss in exports in the EU market.

- The product wise figures suggest that Asian low-income countries' loss in exports in the EU market will be dominated by the loss in exports of textile and wearing apparels. Most of the African countries would however experience loss in exports of agricultural and agro-processing products in the EU market. In the Indian market, Sri Lanka and rest of South Asia would experience loss in exports in a number of mineral and manufacturing products. Bangladesh's loss in exports in the Indian market would be primarily the loss in exports of chemicals, rubber and plastics products. Most of the African countries would incur loss in exports of oil, minerals and mineral products in the Indian market.

- The simulation results in general suggest that the impacts of the EU-India FTA on most of the excluded low-income economies are not very large. It should however be mentioned that the impacts, as derived from the simulation results, are static in nature and the dynamic impacts could be much larger than the static impacts. For example, though the static loss in preference for Bangladesh's exports of textile and clothing in the EU market might appear to be small, such loss in preference might result in long term loss in competitiveness and thus the dynamic losses could be much larger than the static losses.

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