

# EU - India free trade agreement

A quantitative assessment



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## A quantitative assessment

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## **EU - India free trade agreement; A quantitative assessment**

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This report analyses the effects of a regional trade agreement (FTA) between the EU and India, for which negotiations are underway. The study starts with a brief overview of the key insights from the existing literature on FTAs and their relationship with multilateral negotiations. The remainder of the study is devoted to analysing the impact of tariff slashes under an FTA on merchandise trade between the EU and India. Of particular interest are the implications for agricultural markets, given the tension between agricultural liberalisation and India's policy goals relating to self-sufficiency in food grains and poverty reduction. The analysis employs GTAP, a global general equilibrium model using a recent database which has 2004 as its reference year.

The results suggest that India's interests in a regional trade agreement with the EU are downplayed by the fact that India's economy is not well integrated in global markets. Impacts on the EU are minor and further reduced if a Doha agreement is in place when the FTA is implemented. Results indicate the rationale for a strongly asymmetric arrangement: it would be in the interest of both partners if the EU provides large concessions to India for market access, while India maintains the bulk of current border protection. An EU - India FTA delivers little scope for achieving efficiency gains via adjustments to the pattern of international specialisation. An EU - India agreement on merchandise trade is unlikely to embody substantial preferential treatment with regard to market access. Probably, India can find more suitable FTA partners. Agriculture is a key sector for India in the consideration of equity and growth purposes of a FTA with EU.

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# Preface

India is rapidly taking stronger positions in the global political arena and the world economy. By consequence countries need to redefine their relations with India. For the EU this has led to the start of negotiations on a free trade agreement.

The fact that the latest policy paper on India by the Dutch Government (Beleidsnota India), prepared in 2005, makes no reference to a possible free trade agreement, is a sign of the swiftness of change. At that time, a likely prospect was that further economic integration with India would be achieved on the short term through a multilateral liberalization of trade under the Doha Round of WTO trade negotiations. Up to the present, however, the Round has failed to deliver. Parties continue searching for a compromise on global trade reform reflecting that India, with Brazil and other key emerging economies, has brought its political bargaining power in close range to that of the EU and US. A number of countries, foremost the US, have proceeded to realize the benefits of bilateral and regional economic integration. The European Commission has responded to these developments in its 2006 strategy paper 'Global Europe: Competing in the World' in which India was listed as a priority country for a free trade agreement (FTA). Already in October 2007, the first round of negotiations between the European Commission and the Government of India took place.

The negotiations on an EU-India FTA, which have gone through their third round at present, will aim to reduce tariff and core nontariff barriers on 'substantially all trade' between the EU and India. It is expected that the negotiating process will take considerable time and effort, particularly on sensitive dossiers such as agricultural market access. The present study applies global economic modeling in order to quantify the overall economic effects of a potential FTA for the EU and India. It aims to make a substantial contribution to the negotiation process, in particular by suggesting the possible ramifications of reform of tariff and core nontariff barriers on bilateral trade between the EU and India. Furthermore, the study assesses the possible implications for agricultural markets in India by which it lays the basis for further work on the controversies over agricultural liberalization and India's policy goals of poverty reduction and self-sufficiency in food.

This paper is a result of a broader effort to deepen the understanding of India's agricultural trade policies that LEI and Wageningen International undertake upon request by the Netherlands Ministry of Agriculture, Nature and Food

Quality (LNV). Funding has been provided by means of the LNV research program on international cooperation (BOCI). The authors appreciate the kind guidance by Liefke Huizinga, Kristel Hoedelmans and colleagues at the Ministry.

A handwritten signature in black ink, consisting of the letters 'R', 'B', 'M', and 'H' in a cursive, flowing style.

Prof. Dr R.B.M. Huirne  
Director General LEI Wageningen UR

# Summary

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India combines strong support to the endeavours for global trade reform under the World Trade Organisation institutions with an active pursuance of preferential trading arrangements. India views such bilateral and regional trade agreements as 'building blocks' towards the overall objective of multilateral trade liberalisation. Currently, India's preferential trading arrangements mainly involve neighbour countries. Whether there is an economic rationale for India to engage in preferential trading arrangements with more advanced economies such as the EU is to be assessed empirically.

This study examines a possible arrangement between the EU and India, as a case study on the interests of developing countries in a free trade agreement (FTA) with high-income partners. Its aim is to examine the interests of both parties in slashing tariffs on bilateral merchandise trade. Of particular interest are the implications for agricultural markets, given the tension between agricultural liberalisation and India's policy goals relating to self-sufficiency in food grains and poverty reduction.

## *India's interests in a free trade agreement with the EU*

India's interests in a free trade agreement with the EU are downplayed by the fact that India's economy is not well integrated in global markets. Particularly agriculture is a closed sector by all measures. With the EU there is limited economic integration even though the EU is India's largest trading partner for industrial goods and services. Of all bilateral merchandise trade, 95% consists of industrial goods, the rest are agricultural products. The total volume of bilateral agricultural trade is as limited as USD 2.4 bln (data for 2004/05), mostly consisting of Indian exports of tropical products, fruit and vegetables, oilseeds and oils, and cereals into the EU. Due to the limited trade preferences granted to India, the average tariffs on Indian agricultural goods applied by the EU are relatively high compared to imports from other countries. India sees obvious offensive interests, therefore, which relate to improving the access for export products to the EU market. Also an agreement may work to reduce the input costs for export industries in parallel with improved access to high-quality inputs. Even so, India's main offensive interest in an FTA with the EU concerns tariff concessions for industrial products (textiles in particular), and much the same goes for the EU vis-à-vis India.



Possible defensive interests are evident from India's current tariff schedule and structure of imports. They point at possibly large trade diversion effects under an agreement with the EU since such a deal is likely to replace current imports from lower-cost producers in Asia by products from the EU. In addition, given India's strong border protection, deep concessions to the EU may cause large displacement effects as domestic producers suffer from the increased competition of imports from the EU. Such effects, combined with the pivotal role claimed for agriculture in livelihood strategies of the poor and vulnerable, explain why agriculture plays a marginal role in India's bilateral and regional agreements and is excluded in most cases. Likewise, the prospects are dim for a deep integration of agricultural markets with the EU via a free trade agreement.

#### *A quantitative impact assessment*

The overall economic effects and particular product-related interests are explored in model simulations of a possible EU - India FTA. The analysis employs a global economy-wide model (GTAP-AGR) using a recent database. The macro-economic effects of changes in policies are assessed by a well-established welfare economic compensation measure. Since the impacts of preferential trading arrangements are ambiguous, the outcome of the opposing forces of trade creation and trade diversion needs to be assessed empirically.

Because the welfare outcome may depend on the degree of liberalisation undertaken within the FTA, we have applied welfare analysis to a whole range of depths of reform. This has allowed us to explore the common ground for a FTA between India and the EU, as well as conflicts of interests. The summary table reports on the simulated welfare effects for certain key scenarios.

A manufactures-only FTA has potentially positive effects on both India and EU. Whereas it would be welfare-maximising for both countries to strive for complete liberalisation by the EU of non-agricultural trade, there are opposing interests in terms of liberalisation by India. Assuming that any politically feasible agreement needs to yield positive welfare impacts for both parties, India's liberalisation would be in between 30 and 70%, with the lower number maximising India's welfare. Thus, the 'optimal' liberalisation of non-agricultural trade from India's perspective is a complete abolishment of tariffs by the EU (100% liberalisation), combined with a limited effort in India involving a 30% slash of applied tariffs on imports.

If we broaden the scope of the deal to include agricultural trade liberalisation, few additional gains occur. We analysed agricultural liberalisation on top of an asymmetric FTA in manufactures trade (full liberalisation by the EU and 30%

by India). Results indicate limited benefits for India from its own liberalisation, which contrast with significant benefits from EU agricultural liberalisation. For India, the extent to which the EU liberalises agricultural trade is a critical factor. India's 'optimum' is defined under the scenarios of 100% liberalisation by the EU with 20% by India. This scenario of partial opening for industrial and agricultural products from the EU combined with the complete removal in the EU of tariffs on imports from India maximises India's gains from an arrangement with the EU at 0.2% of GDP.

<b>Table 1</b>				
<b>Income effects under 'optimal' scenarios a)</b>				
<b>Scenarios</b>	<b>(Depth of liberalisation in% under selected scenarios)</b>			
	<b>India maximises gains</b>		<b>EU maximises gains</b>	
	Only non-agricultural	Non-agricultural b) & agricultural	Only non-agricultural	Non-agricultural b) & agricultural
EU tariff cut on imports from India	100	100	100	80
India tariff cut on imports from EU	30	20	70	100
Simulated effects	(% of GDP)			
EU	0.002	0.002	0.011	0.005
India	0.126	0.209	0.017	0.145

a) Welfare effects based on the equivalent variation measure; b) Agricultural liberalisation scenarios combined with non-agricultural liberalisation scenario EU\_100/India\_30.  
Source: model simulations.

### *Conclusions*

An interpretation of these welfare effects, combined with a review of the effects on factors of production, output and trade, leads to the following conclusions:

'The overall interests of India in a trade deal with the EU that slashes tariffs on bilateral merchandise trade are limited, although specific risks and gains are present.'

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. A stronger economic rationale for a free trade agreement with the EU is possibly found in the benign effects of 'deep' economic integration, i.e. a move towards an economic space where goods and capital move without barriers under jointly shared rules - but

these have not been examined. The impact of tariff reduction under a possible EU - India free trade agreement involves potential losses from a far-reaching FTA with the EU. The EU, an important source of industrial imports for India, will expand its position on the Indian market in the area of industrial goods and extraction goods, particularly at the expense of lower-cost producers in Asian countries. The EU is hardly a logical trading partner for more labour-intensive manufactures or for agricultural products from the perspective of production costs. The widely feared displacement of domestic production by imports of EU origin appears limited, however, and few Indian jobs are directly at risk. As far as offensive export-related interests are concerned, the study finds gains related to improving the access for export products to the EU market, reducing input costs for export industries in parallel with improved access to high-quality input. This transfer of technology is intertwined with an agenda for direct investment into India. Particular product related offensive interests explored in model simulations conditional on the EU opening up markets involve textiles, cotton for intermediate deliveries to textiles industry, rice, and possibly sugar.

*The EU economy remains essentially unperturbed by integration with India*

The simulations indicate limited scope for welfare gains in the EU, but on the other hand no major welfare losses either. Sector-specific interests include offensive interests in capital-intensive manufacturing and natural resource extraction (presumably oil and fuels). Offensive interests for an agriculture-inclusive deal are present in the fruits and vegetables sector.

*The estimated positive impacts from an EU - India FTA erode under a successful global trade reform embodied by a possible Doha agreement*

As expected, a global reform reduces the potential gains for India from an FTA with the EU and, at the same time, narrows the scope for trade diversion and concurrent efficiency losses. For India, a moderation of the risk of strong losses could provide leeway to embark on a track of bilateral integration with the EU despite a strong economic rationale. In the EU, multilateral liberalisation reduces the incentives for a FTA with India, but it does not change the incentives for a particular level of liberalisation. For the EU we find even smaller welfare gains with a Doha agreement in place, but also the optimal level of liberalisation of agriculture reduces from 80 to 40%.

*An EU - India agreement on merchandise trade is unlikely to embody substantial preferential treatment with regard to market access*

If the welfare analysis outlines the feasible options for trade integration between India and the EU, the arrangement would be characterised by a strong asymmetry: even though full liberalisation of agriculture by India would be 'optimal' for the EU (see table), this is still combined with a strongly asymmetric liberalisation of non-agriculture (100% by EU and 30% by India). The analysis indicates that it would be in the interest of both partners if the EU provides large concessions to India for access to its markets, while India keeps the bulk of current border protection. This finding contrasts with the current trade policy of the EU which focuses on reciprocal trade agreements, and it is potentially conflicting with WTO rules that require a FTA to cover 'substantially all the trade' between the constituent members. It is therefore likely that an EU - India agreement will embody a wide coverage of merchandise trade, even if excluding from its coverage sensitive areas in agriculture and textiles like many other FTAs. At the same time, the depth of preferential treatment on market access that India and the EU will grant to imports from their FTA partner will probably be modest, and engineered towards specific benign impact in certain areas.

*Agriculture is a key sector for India in the consideration of equity and growth purposes of a FTA with EU*

India's welfare-maximising policy, given full liberalisation by the EU, involves a 30% cut of agricultural import tariffs for EU products and a 70% cut of tariffs on other merchandise trade. Agricultural reform creates large rents for land-owners, and has a limited pull effect on unskilled labour. This strategy maximises income gains (an approximation of economic growth), and it generates small but positive effects on poverty alleviation. A maximisation of poverty alleviation effects requires an alternative policy, i.e. a deeper liberalisation of manufactures trade while leaving agricultural protection at the status quo. This policy, basically a textiles-oriented export strategy, results in a pull of unskilled labour demand in textiles and cotton farming, resulting in positive employment (or wage) effects for landless and urban labourers. Substantial poverty alleviating effects are achieved, however, at the expense of income gains due to strong trade diversion effects. These are indications that trade policies in India feature a trade-off between a strong-growth policy and poverty alleviation, pressing the need for the government of India to strike a balance between these potentially conflicting goals.

# 1 Introduction

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With the Doha Round of near-global trade negotiations under the World Trade Organisation is facing headwinds, there is a renewed interest in trade integration on a bilateral track. The US are negotiating free trade agreements or less ambitious deals with trade partners in Asia and Latin America. Asian countries including India, opposing such deals for a long time, are also actively exploring opportunities on the bilateral path. These developments have considerable implications for third parties. Threatened by the prospects of a Doha round that fails to result in substantially improved global market access and bilateral integration of its competitors, the EU has responded with a strategy of its own (European Commission, 2006). Thus we see a growing 'wave' of regionalism, largely with a North-South orientation.

There is a large literature on preferential trading arrangements, covering both conceptual and empirical grounds.<sup>1</sup> Theoretical ambiguity implies that analysts must rely on empirical assessments in order to arrive at a conclusion on the desirability of regional integration on economic grounds. This study contributes to the ex ante evidence on the interests of the developing countries in a regional trade deal with high-income partners. It examines a possible arrangement between the EU and India, as a case study.

We are particularly interested in the implications for agricultural markets, given the tension between agricultural liberalisation and India's policy goals relating to self-sufficiency and poverty reduction. A strong opponent of multilateral liberalisation, India has simultaneously demanded policy instruments to be able to shield producers from global markets in cases of strong sudden import competition. The agricultural sector is designated a prime beneficiary of this protection under a policy goal to achieve self-sufficiency. We therefore explore the impact of a FTA in the absence of a Doha deal, to assess whether similar safeguards are required. We then assess whether a successful conclusion of the Doha round would alter India's position in the FTA.

The analysis is based on a quantitative assessment of the economic impact of an EU - India trade agreement under varying depth of reform. A global general equilibrium modelling framework has become the standard for this type of

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<sup>1</sup> Regional trade agreements are another term for preferential trading arrangements, and are not limited to countries that are geographically close. For an overview of the academic literature on reciprocal FTAs, see Panagariya (2000).

analysis. In particular we apply the GTAP-AGR model, and version 7 of the GTAP database - a setup that allows us to analyse the effects on agricultural production and trade in ample detail. Still, in the assessment of a country as vast and heterogeneous as India, the analyst has to cope with substantial limitations discussed below.

## 2 The scope and effects of bilateral and regional trade agreements

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An EU - India trade agreement is one of dozens of preferential trading arrangements under preparation. Roza and Achterbosch (2007) count 43 initiatives that may have important implications for agricultural markets if the arrangement includes substantial concessions on agricultural trade. The count is based on all bilateral or regional initiatives for a reciprocal arrangement, under negotiation or foreseen, that include one of the major agricultural trade nations (Australia, Canada, European Union, Japan, New Zealand and US), or China or India. The two other major agricultural nations, Brazil and Russia, are not actively pursuing new deals. In 26 initiatives, mutual agricultural trade of the potential partners exceeds an annual value of USD 1 billion. Of this subset of potential arrangements, 16 initiatives address a base-situation with agricultural tariffs exceeding 15% ad valorem equivalent, including the FTA between EU and India. These 16 initiatives thus offer scope for substantial concessions on agricultural trade.

The interests and drivers of preferential trade arrangements largely lie outside the agrifood sector. Rather, these are defined by the opening up of opportunities for trade in services and industrial goods and for investment. A scoping study on regional trade agreements in all areas outside agriculture (OECD, 2005) identified the following areas as key areas:

- market access for merchandise trade;
- rules of origin;
- trade defence instruments;
- services;
- trade facilitation.

With moderate ambition, agriculture is part of nearly all negotiations and the above areas are relevant for agriculture as well.

Typical provisions regarding market access are primarily aimed at an expansion of trade between partners, which is regarded a basic, or 'shallow', degree of integration. In a process of economic integration, the expansion of trade relation will increase the incentives for more comprehensive cooperation increase. A 'deep' integration aims to develop 'a common marketplace across countries, that permits enterprises to operate easily across national borders and to integrate production in regional value chains' (Evans, Kaplinsky and Rob-

inson, 2006). In addition to lowering tariffs, deep integration involves harmonising market institutions, standards and legal norms such as commercial practices, administrative and contract law, regulation of labour markets and anti-trust behaviour, financial investment, and government procurement. A key characteristic of deep integration is a potential synergy between increased trade, increases in productivity, and growth (Evans, Kaplinsky and Robinson, 2006).

The coverage of agriculture under preferential trading arrangements typically reflects the situation at the multilateral level: in many subsectors border protection and subsidies are exempted from the full discipline of reform. Yet there are occasional improvements, typically not concerning tariff concessions but areas such as safeguards and export competition (OECD, 2005). The possible elements of negotiations on a preferential trading arrangement with relevance to agriculture are listed in table 2.1.

<b>Table 2.1 Relevance of FTA negotiations to agriculture</b>	
<b>Label</b>	<b>Scope</b>
Market access (tariffs)	Concessions beyond MFN or general preferential schemes covering 'substantially all trade'. Product-based exemptions from the (deepest) cuts: sensitive products and special products.
Rules of origin	Serve to control potential spillovers of trade preferences on third countries. Substantial administrative transaction cost may prevent utilisation of trade preferences.
Trade defence instruments	Issues under negotiation include anti-dumping action, countervailing duties, safeguard measures, etc.
Trade facilitation	Reductions of trading costs by facilitating procedures such as automated customs administration.
Non-tariff barriers	Technical barriers including sanitary and phytosanitary (SPS) measures. Issues under negotiation include the equivalence of technical and safety standards, import certificates, procedures for conformity assessment.
Non-trade concerns	Standards arising from non trade concerns including those related to environmental protection, labour standards, animal welfare. Aim for consistent policies in terms of trade and agricultural development.
Investment and intellectual property rights	Liberalisation of direct investment; reform of economic institutions including intellectual property rights.



The welfare effects of a FTA are not straightforwardly determined. The introduction of the concepts of trade creation and trade diversion marked the development of the economic theory on preferential trade agreements. The legacy of Viner's 1950 classic 'The Customs Union Issue' remains important in the policy debate up to this day. Trade creation is defined as the shift from higher-cost domestic or foreign sources of goods to lower-costs sources from a partner country under the agreement. Because such a shift gives rise to reduced price levels in the importing country, and possible trade expansion, trade creation is commonly associated with a welfare gain for the importer. Trade diversion is the replacement of imports from lower-cost sources outside the agreement by higher-cost sources of partners in the agreement. Due to a likely raise in the domestic price of imports and foregone tariff revenues, trade diversion often accounts negatively in the welfare analysis.<sup>1</sup> It is likely that under a trade agreement trade creation in certain economic activities will coincide with trade diversion in other areas. By implication, the net welfare effect of a preferential trade agreement is theoretically ambiguous. Analysts must rely on empirical assessments in order to arrive at a conclusion on the net welfare impact of an agreement, examining the specific response of demand and supply to a policy.

<sup>1</sup> Under certain conditions, most notably a strong price responsiveness of export supply from the not-lowest-cost partner in the agreement, trade diversion may result in a welfare gain (Panagariya, 2000).

## 3 The likely scope of an EU - India FTA

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This chapter explores the scope of a trade agreement between the EU and India. It starts with a short characterisation of the EU and Indian economy in a global context. Border protection in both countries is shortly described. The last section summarises some key features of trade relations between the EU and India and places it in the context of other possible FTA agreements of India.

### 3.1 India and regionalism

India combines strong support to endeavours for global trade reform under the World Trade Organisation institutions with the pursuance of an active FTA agenda. India views FTAs as 'building blocks' towards the overall objective of multilateral trade liberalisation (Government of India, 2007). Under the current government, India has been switching from Free Trade Agreements (FTAs) to Comprehensive Economic Partnership Agreements (CEPAs). These broader agreements cover not only FTAs in goods and services, but also investment and they identify areas of economic cooperation. In Asia, India is not standing alone in this proliferation of regional or bilateral agreements. Korea, Pakistan, Singapore and Thailand are also frequently negotiating bilateral agreements

India is involved in some preferential trading arrangements mainly with South Asian partners, particularly neighbouring countries. It is a serious handicap to the South Asian FTAs that the policies to enhance economic integration work from a limited base of trade and investment between the countries: India's trade with its preferential partners in Asia only accounts for about 4% of its total global trade (Nataraj, 2007).

The main FTA that India is party to is the South Asian Preferential Trading Arrangement (SAPTA), signed in 1993 in the context of SAARC (South Asian Association for Regional Cooperation). Under SAPTA, seven countries (India, Pakistan, Bhutan, Bangladesh, Sri Lanka and the Maldives) grant each other preferential trade concessions. At present, these concessions are limited. While SAPTA members pledge towards a genuine free trade area, political tension between India and Pakistan constrains progress. India and Sri Lanka already trade under a bilateral arrangement, albeit largely to the benefit of the latter. The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation

(BIMST-EC), with India and Thailand among the most prominent of five members, specifies very limited concessions in a few sectors.

The possibly most promising FTA in the region, the Bangkok Agreement (BA), signed in 1975, features India, Bangladesh, South Korea, Laos and Sri Lanka. With the accession of China in 2001, the scheme's potential increased dramatically. However, the BA specifies concessions for just a few products. By implication of the limited scope of the concessions under the BA and SAPTA schemes, they render little impact on India's economic integration in the region. Stanford economist Romain Wacziarg (2003) concludes from the slow progress of initiatives that the feasibility of expanding regional trade agreements in South Asia and their scope in terms of increasing India's level of openness would probably be limited.

Complementary to the regional option, India is currently exploring the scope for preferential arrangements with partners that represent a more substantial expansion of India's external markets. Currently India is most active in pursuing a trilateral FTA with Brazil and South Africa (two of its colleagues from the G-20 group in the WTO negotiations). The focus changed since negotiations on a free trade agreement (FTA) with Association of South East Asian Nations (ASEAN) slowed down.<sup>1</sup> At present, India is negotiating with the EU, Bangladesh, the Gulf Cooperation Council (GCC), Japan, Mauritius and the Southern African Customs Union. Other potential agreements are still under consideration with China, Egypt, Indonesia, Israel, Korea, Malaysia and Russia.

Whether there is an economic rationale for India to engage in preferential trading arrangements with more advanced economies is to be assessed empirically, and herein lays the contribution of the present study. As a part of the exercise, we may identify to what extent concerns over the displacement of production under such arrangements are supported by economic analysis. The political feasibility of Indian policies to integrate with economic giants will depend on the strength of domestic resistance.

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<sup>1</sup> Well-informed sources suggest that India's import duty on palm oil is troubling the negotiations with ASEAN (ICTSD, 2007). ASEAN wants India to reduce the duties on refined palm oil from 52.5 to 30%, and on crude palm oil from 45 to 40%. India refuses to do so, since it fears that import surges from Malaysia (and Indonesia) will harm Indian farmers growing oil crops. Moreover, an eventual agreement will be far less ambitious than India would like to, because services and foreign investment are not included and ASEAN has come up with a long list of 100 highly sensitive products.

### 3.2 Indian interests in EU free trade agreement

India's economy is not well integrated in global markets, particularly agriculture. Merchandise trade as a percentage of GDP increased to about 33% in 2006/07, from a base of 21% in 2000/01, reflecting limited but increasing openness of India's goods markets. Data for 2006 indicate that India is the world's 28th largest exporter of merchandise, with a share of 1% of world exports (WTO 2007, appendix table A1.3); in commercial service exports, India ranks tenth with a share of 2.7%, up from 2.5% in 2002 (WTO 2007, appendix table A1.5). Owing to its large size India trades much less internationally than the average country but the integration is limited by all standards.

The EU is India's largest trading partner for industrial goods and services; agricultural markets are hardly integrated. Of all bilateral merchandise trade, 95% consist of industrial goods. On the agricultural trade balance with the EU, the surplus of India's exports to the EU over imports from the EU amounts to USD 1.26 billion in 2006. When it comes to agricultural trade liberalisation, the regional trade agreements will not provide much leverage, since agriculture plays a marginal role in India's bilateral and regional agreements and is invariably excluded in most cases. The Doha negotiations on agriculture therefore present the primary platform for India to pursue its agricultural liberalisation objectives. Tariff protection is underlying this pattern (table 3.1).

As far as agriculture is concerned, India has strong defensive interests to an arrangement with the EU. The offensive interests relate to improving the access for export products to the EU market, reducing input costs for export industries in parallel with improved access to high-quality input. This transfer of technology is intertwined with an agenda for direct investment into India. Particular product related defensive and offensive interests are explored in model simulations conditional on EU opening up markets.

	Tariffs levied by EU on imports from:		Tariffs levied by India on imports from:	
	India	rest of World	EU	rest of World
Paddy rice	61.3	53.1	8.4	26.1
Wheat	7.1	17.1	0.0	4.0
Cereal grains nec b)	20.2	24.0	11.3	21.2
Vegetables, fruit, nuts	1.5	15.4	43.9	34.4
Oil seeds	0.1	0.0	25.7	34.8
Sugar cane, sugar beet	0.0	1.3	0.0	0.7
Plant-based fibbers	0.0	0.3	13.2	17.5
Crops nec	1.8	6.9	26.0	34.0
Cattle, sheep, goats, horses	7.7	1.0	5.3	15.2
Animal products nec	4.9	2.5	3.7	18.9
Raw milk	0.0	0.0	0.0	0.0
Wool, silk-worm cocoons	0.0	0.0	15.0	20.0
Meat: cattle, sheep, goats, horse	237.4	76.0	14.6	21.2
Meat products nec	16.0	25.7	35.3	28.1
Vegetable oils and fats	1.7	7.6	69.9	64.4
Dairy products	19.9	39.3	35.9	31.1
Processed rice	128.9	98.3	58.2	23.1
Sugar	138.6	119.7	48.7	69.8
Food products nec	7.1	8.2	39.6	31.9
Beverages and tobacco products	20.4	9.1	138.6	87.1
Natural resources extraction	0.5	0.2	15.0	11.7
Textiles and leather	7.2	5.2	15.1	15.0
Labour intensive manufactures	1.8	2.9	14.4	19.5
Capital intensive manufactures	0.4	1.3	14.0	14.0

a) Tariffs are computed from tariff lines using trade as weights. Effective tariffs may thus be zero due to initial zero imports despite a tariff being present in practice; b)nec = not elsewhere classified.  
Source: GTAP Version 7, pre-release 3 (October 2007).

Technology transfer is considered an important element of 'deep' economic integration between India and the EU, which would entail a move towards an economic space where goods and capital move without barriers, under jointly shared rules. Gasiorek et al. [2007] identify substantial scope for addressing such issues under an EU - India FTA, in particular in the areas of government procurement; services and investment; trade facilitation; defence measures in trade; nontariff barriers of standards and regulations that relate to WTO agreements on sanitary and phytosanitary (SPS) measures and technical barriers to trade (TBT); intellectual property rights, and competition policy. Even though the account is somewhat biased towards the EU interest, on the basis of it one may conclude that the benign effects of deep economic integration could very well provide India with a strong economic rationale for a free trade agreement with the EU. However, a further quantitative analysis of such elements of an FTA lies beyond the scope of the present study.

### **3.3 Agricultural interests of an EU - India deal versus other initiatives of India**

Next to a potential deal with the EU India is exploring two other FTAs covering agriculture, with ASEAN and with Japan. Table 3.2 compares agricultural interests of an EU - India deal with these other initiatives. Although the value of total bilateral trade with the EU (USD45.6 billion) by far exceeds the trade with the partners in the other agreements this does not hold for trade in agricultural products. Of the three potential agreements the one with ASEAN has the largest base on current trade in agricultural products (USD3.7 billion), which accounts for 22% of total trade with ASEAN partners.

Agriculture plays a marginal role in the trade relationship between the EU and India. Further, EU agricultural exports to India are very small compared to imports from India. However, the EU applies a relatively high average tariff on Indian agricultural goods. Main agricultural export products from India are: tropical products, fruit and vegetables, oilseeds and oils, and cereals. The EU's main interest in an FTA with India concerns tariff concessions for industrial products.

India has a lot to win from an FTA with ASEAN, since average agricultural tariffs in Indonesia and Thailand and to a lesser extent in Malaysia are very high and India has a negative agricultural trade balance with ASEAN. Inclusion of agriculture results in increased import competition for the Indian farm sector.

<b>Table 3.2 Potential scope of agriculture-inclusive FTAs for India</b>			
	<b>India-EU</b>	<b>India-ASEAN</b>	<b>India-Japan</b>
Total bilateral trade (average 2004/05, fob prices, billion USD)	45.6	16.8	6.2
Agricultural bilateral trade (average 2004/05, fob prices)	2.4	3.7	0.6
Agricultural trade as percentage of total trade	5	23	10
Agricultural trade balance in favour of	India	ASEAN	India
Further information:			
EU - India	EU	<a href="http://ec.europa.eu/trade/issues/bilateral/countries/india/index_en.htm">ec.europa.eu/trade/issues/bilateral/countries/india/index_en.htm</a>	
	India	<a href="http://commerce.nic.in/India-EU-jap.pdf">commerce.nic.in/India-EU-jap.pdf</a>	
ASEAN-India	ASEAN	<a href="http://hwww.aseansec.org/4971.htm">hwww.aseansec.org/4971.htm</a>	
	India	<a href="http://commerce.nic.in/agree_asean.htm">commerce.nic.in/agree_asean.htm</a>	
India-Japan	Japan	<a href="http://www.meti.go.jp/english/policy/index_externaleconomicpolicy.html">www.meti.go.jp/english/policy/index_externaleconomicpolicy.html</a>	
	India	<a href="http://commerce.nic.in/japan.pdf">commerce.nic.in/japan.pdf</a>	

## 4 Model, data and scenarios

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Because preferential trade agreements cover several sectors if not the economy at large, such policies are often assessed using economy-wide models.<sup>1</sup> This study employs an all-sector model covering all regions of the world in order to assess the economy-wide implications in FTA partners as well as third countries. Examples of previous studies with a similar setup are McDonald and Walmsley (2004) and Decreux and Mitaritonna (2007). Such studies share a focus on the shallow integration because the implications of deep integration for productivity change and economic growth are particularly difficult to incorporate.

### 4.1 A short description of GTAP-AGR

Our estimates of economic effects from an EU - India FTA are obtained using an economy-wide model known as CGE (computable general equilibrium). This has become the dominant tool in global trade policy analysis. CGE models provide a complete representation of national economies and a specification of trade relations between economies. CGE models are specifically concerned with resource allocation issues, that is, where the allocation of production factors over alternative uses is affected by certain policies or exogenous developments. International trade is typically an area where such induced effects are important consequences of policy choices. In the face of changing international prices, resources will move between alternative uses within the domestic economy, or even between economies if production factors are internationally mobile.

Market equilibrium models<sup>2</sup> contain the response (behaviour) of economic agents to changes in prices (costs), and prices adjust so as to clear markets. The objective of these models is the determination of equilibrium prices and quantities on (interrelated) sets of markets. This class of models is firmly established within mainstream economics where the behavioural response of suppliers and buyers is typically derived from optimising assumptions: given a

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<sup>1</sup> Alternatively, the use of econometric models, such as gravity analysis in OECD (2007), may cover a range of sectors but is confined to the assessment of trade effects between FTA partners.

<sup>2</sup> 'Gravity models' are another important class of models in international trade analysis. These are less explicit about their theoretical underpinning and focus on econometric estimates. They are sometimes used in ex-ante analysis of trade policy changes.



description of the production technology, the supplier chooses a combination of inputs such that costs are minimised for a given level of output. Given a description of consumer preferences, the buyer determines his preferred consumption bundle such that his/her utility is maximised for a given level of his/her budget.

The framework adopted in this study is a model of the GTAP (global trade analysis project) consortium, which is a comparative static, multi-sector, and multi-region general equilibrium model. Each country or region is depicted within the same structural model. The regional household to which the income of factors, tariff revenues and taxes are assigned represents the consumer side. It is assumed that the regional household allocates its income to three expenditure categories: private household expenditures, government expenditures and savings. Consumption of private household is depicted using a Constant Difference of Elasticities (CDE) function, the virtues of which is that budget shares vary with changes in income (e.g., the portion of income spent on food items declines as income rises).

A representative producer for each sector of a country or region makes production decisions to maximise profits by choosing inputs of labour, capital, and intermediates to produce a single sector output. Producers can substitute primary factors (labour and capital) for each other, and this substitution possibility is captured using a Constant Elasticity of Substitution (CES) functional form. In the case of crop production, farmers also make decisions on land allocation. In addition, it is assumed that intermediate goods (goods produced by other sectors) are used in fixed proportions (Leontief) in manufacturing. Intermediate inputs are produced domestically or imported, while primary factors cannot move across country. Internationally traded commodities are assumed to be distinguished according to the region of origin. Using this so-called Armington assumption implies that, for example, wheat imported from the US is different from wheat imported from the EU, and trade flows in both varieties have their own price tag. A great advantage of the Armington assumption is that it allows us to model bilateral trade flows and bilateral trade policies. This feature allows us to model a preferential trade regime between the EU and India since trade flows between these two regions are distinguished from trade with other regions.

The GTAP model includes two global institutions. All transports between regions are carried out by the international transport sector. The trading costs reflect the transaction costs involved in international trade, as well as the physical activity of transportation itself. Using transport inputs from all regions the international transport sector minimises its costs under the Cobb-Douglas technology. The second global institution is the global bank, which takes the savings

from all regions and purchases investment goods in all regions depending on the expected rates of return. The global bank guarantees that global savings are equal to global investments.

Taxes are included in the theory of the model at several levels. Production taxes are placed on intermediate or primary inputs, or on output. Some trade taxes are modelled at the border. Additional internal taxes can be placed on domestic or imported intermediate inputs, and may be applied at differential rates that discriminate against imports. Trade policy instruments are represented as import or export taxes/subsidies. A detailed discussion of the basic algebraic model structure of the GTAP model can be found in Hertel (1997), chapter 2.

The specific model used in this study is GTAP-AGR (Keeney and Hertel, 2005), a modified version of the standard GTAP model described above to account for specific features of agricultural trade. Key features of GTAP-AGR are: segmented factor markets, substitutability of intermediate inputs and crop-livestock interactions.

*Segmented factor markets* are included for labour and capital to account for empirically observed price differences between agricultural and non-agricultural sectors. This implies that in the model labour and capital can move freely within agricultural or within non-agricultural sectors, but are less easily shifted between agricultural and non-agricultural sectors. This implies that differences in remuneration can exist between the agricultural and non-agricultural sectors, which would not be possible if labour and capital were perfectly mobile. There is no need for a comparable assumption for land since land is only used by the agricultural sectors.

*Substitutability of intermediate inputs* is included for the agricultural sectors. In the standard GTAP model each unit of output requires a fixed amount of intermediate inputs. This implies that even if prices would change no substitution between production factors and intermediate inputs occurs. In GTAP-AGR there is a possibility to substitute between factors of production and intermediate inputs. If, for example, labour costs increase it is thus possible to increase the use of herbicides etc. (which are intermediate inputs from the chemical industry) to save on labour time.<sup>1</sup>

*Crop-livestock interactions* are included in GTAP-AGR to account for shifts in the crops used for livestock feed when prices change. Empirical findings indicate the importance of accounting for these interactions, particularly in the EU. Note that, in the analysis, livestock consumption and production will alter only in

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<sup>1</sup> GTAP-AGR furthermore allows for substitution between intermediate inputs.

response to the relative price changes induced by policy reform and related income effects, but not to economic growth or rising purchasing power as these are assumed constant.

## 4.2 Measures of welfare impacts

The macroeconomic effects of changes in policies are typically assessed by the well-established welfare economic compensation measure which is the measure that is used in this study. The so-called equivalent variation (EV) measures *what change in income would be equivalent to the proposed policy change*. In other words, the EV is the amount of income that should be given to (or taken away from) households to achieve a welfare that is similar to that which occurs when a ceRTain policy change comes into effect. This measure always informs us about the potential welfare change and it does not inform us about distributive effects. In fact, if the EV is positive, we know that enough resources are mobilised such that the winners from the policy move can potentially compensate the losers. The EV is firmly grounded in the welfare economic literature, and provides the ultimate measure of how well an economy is doing when implementing a policy change.<sup>1</sup> In this study we will assess the two main drivers of the total welfare impact: allocative efficiency effects and terms of trade effects.

*Allocative efficiency* gains arise when, due to the removal of distortions, the factors of production (capital, labour and land) move more easily to their most efficient use, resulting in a (better approximation of the) optimal allocation of resources. The related productivity growth transfers into declining producer and consumer prices, and demand and supply expansion. In the process, global patterns of specialisation and trade change, as factors of production move in and out of countries and sectors. Estimated efficiency gains are useful indicators of the current depth of distortions per sector.

*Terms of trade effects* provide a summary measure that indicates the change in the ratio of prices received for exports and prices paid for imports. Declining terms of trade, i.e. a drop of export prices relative to import prices, often account negatively in the welfare evaluation. The intuition is that declining terms of trade represent a loss in the purchasing power of export. Note that in

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<sup>1</sup> While the EV takes the new situation as a reference, the alternative measure known as Compensating Variation (CV) takes the old situation as the reference. It asks the hypothetical question: 'What is the minimum amount of compensation after the price change in order to be as well off as before the change?'

the model, we assume perfect markets, so that we do not allow for any flaws in price transmission.

Terms of trade effects are a macro-economic phenomenon, which ultimately reflect the changes in the country's real exchange rate. A negative term of trade effect generally, but not always, reflects a drop in factor prices (land, labour and capital) relative to a worldwide average of factor prices. To appreciate this fundamentally macro-economic phenomenon, it is useful to recall the basic definition of the economy's external equilibrium, the balance of payments:

$$(X-M) - (S-I) = \text{BoT} + \text{BoKA} = \text{BoP} = 0.$$

The sum of the balance of trade, BoT, which is the difference between exports, X, and imports M, plus the balance of capital, BoKA, which is the difference between savings, S, and investments, I, must always be equal to zero. The balance of payments, BoP, always balances.

If a tariff cut is undertaken, imports will rise and this leads to a disequilibrium that must be resolved. Either exports must rise, or investments must rise, or savings must decline to restore the balance of payments. For ease of explanation we assume that investments and savings are fixed (although in the model this is not really so), so that adjustments have to occur by an expansion of exports. The basic mechanism through which exports can be increased is a drop (or a less rapid rise) in export prices, which makes the country's products more attractive than other suppliers'. Generally it will be the domestic prices of primary production factors, land, labour and capital that will bring about this fall in export prices. A depreciation of domestic factor prices then restores the balance of payments.

Another mechanism through which the balance of payments (under certain circumstances) may be restored is through prices of intermediate inputs. If initial levels of border protection are high, lowering border protection leads to price drops for imported intermediate inputs, and consequent substitution towards imported goods. The price drop for inputs, in turn, leads to lower production cost, which ultimately translates into lower prices for exported goods, hence depressing their terms of trade, but at the same time boosting export volumes. In these circumstances primary factor prices may rise as economic expansion leads to more demand for labour and other factors, while the drop in costs of imported intermediate inputs assures that balance is maintained on the balance of payments.

### 4.3 Model database and aggregation schemes

The study is based on a new version of the GTAP database (Version 7, pre release 2 of July 2007) with the following improvements over Version 6:

- base year 2004 (was 2001 in Version 6): 2004 macroeconomic aggregates data from the World Bank augmented with data from published sources (World Development Report, CIA Factbook); 2004 bilateral trade data reconciled data from UN COMTRADE;
- new regional classification (101 regions): This includes new input-output tables for Nicaragua, Kazakhstan and Kyrgystan; updated I-O tables for China, Indonesia, Chile, and Turkey; minor corrections on the I-O tables for Belgium, Luxembourg, and France;
- domestic support data: The 2004 domestic support data are available for the following OECD countries (Australia, Canada, European Union 15, Iceland, Japan, Korea, Mexico, Norway, Switzerland, Turkey, and the United States) as well as for China, Brazil, and South Africa; these data are combined with additional data on 2004 domestic support data for individual EU25 member countries;
- agricultural export subsidy data: The dataset covers agricultural export subsidies as notified to the WTO for 2004 or the closest available year for European Union 25 (2002), Canada (2004), Israel (2003), Morocco (2002), Norway (2001), Panama (2003), Switzerland (2003), Tunisia (2002) and the United States (2002);
- 2004 preferential tariffs data from Market Access Maps (MAcMaps): Combined data on ad valorem tariffs and the ad valorem equivalent of specific tariffs is incorporated in the data base;
- estimates of the export tax equivalents of quotas on textile and wearing apparel exports to Canada, USA, and the EU15 under the Agreement on Textiles and Clothing: for Canada and the EU15, the ETE estimates are for 2003 and for the USA, the ETE estimates are for 2004;
- improved data on trade in services from The Netherlands Bureau for Economic Policy Analysis (CPB).

A major limitation of using the Version 7 database is that the detailed tariff data from MAcMaps are not yet made available. This implies that the computations of tariff reductions for the Doha scenario in the study rely on 2001 tariffs. The above advancements in the Version 7 database however outweigh this limitation in terms of tariffs.

### *Sector aggregation*

The GTAP database distinguishes 57 sectors, of which 12 are related to primary agriculture and 8 to agro-food processing. Technically it is not possible to include all 57 sectors in the model and an aggregation therefore needs to be devised. The chosen aggregation reflects the focus of the study on agriculture and on India by keeping maximum detail in agricultural sectors while representing non-agricultural sectors in a more aggregate manner. The result is a model aggregation with 25 sectors of which 12 represent primary agriculture, 8 agro-food industry and five sectors cover a broad range of non-agricultural sectors (table 4.1).

The industrial sectors are grouped under four headings: natural resource extraction, textiles and leather, labour intensive manufactures and capital intensive manufactures. Textiles are a recurring issue both in the WTO context and therefore kept apart from the other industrial sectors. The grouping of manufactures based on the labour and capital use serves to trace possible different comparative advantages of the EU and India in terms of labour and capital. Finally, all services sectors are combined into a single sector.

### *Region aggregation*

The GTAP database Version 7 distinguishes 101 regions. For technical reasons these have been grouped into 20 regions (Table 4.2). Policies and effects of countries or trade blocs can only be analysed sensibly if these countries or trade blocs are selected as individual groups. For example, by lumping Turkey and Norway together, the model will return results for a hypothetical country Turway (or Norkey) but will not allow one to assess the impact on each of these countries separately.

The study focuses on the implications of a potential bilateral agreement between the EU and India. We take The Netherlands out of the EU27 aggregate (which thus reduces to a EU26 aggregate), as can be seen in table 4.2. This allows a more detailed assessment of the impact on the Netherlands, which is expected to differ from the aggregate EU effect due to the higher trade intensity in The Netherlands compared to the rest of the EU. Several key players in the agricultural markets are distinguished.

<b>Table 4.1</b>		<b>Sector aggregation</b>	
	<b>Code</b>	<b>Description</b>	<b>GTAP sectors covered</b>
1	pdr	Paddy rice	Paddy rice
2	wht	Wheat	Wheat
3	gro	Cereal grains nec a)	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 fibres	Plant-based fibres
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	cmt	Meat: cattle, sheep, goats, horse	Meat: cattle,sheep,goats,horse
14	omt	Meat products nec	Meat products nec
15	vol	Vegetable oils and fats	Vegetable oils and fats
16	mil	Dairy products	Dairy products
17	pcr	Processed rice	Processed rice
18	sgr	Sugar	Sugar
19	ofd	Food products nec	Food products nec
20	b_t	Beverages and tobacco products	Beverages and tobacco products
21	Extract	Natural resources extraction	Forestry; Fishing; Coal; Oil; Gas; Minerals nec
22	TexLea	Textiles and leather	Textiles; Wearing apparel; Leather products
23	Lab-Man	Labour intensive manufactures	Wood products; Paper products, publishing; Metal products; Motor vehicles and parts; Transport equipment nec

Table 4.1		Sector aggregation (cont.)	
	Code	Description	GTAP sectors covered
24	Cap- Man	Capital intensive manufactures	Petroleum, coal products; Chemical, rubber, plastic prods; Mineral products nec; Ferrous metals; Metals nec; Electronic equipment; Machinery and equipment nec; Manufactures nec
25	Svces	Services and activities NES	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; PubAd- min/Defence/Health/Educat; Dwellings

a) nec = not elsewhere classified.

In order to assess the impact of trade liberalisation on the main trade blocks we distinguish MERCOSUR, ASEAN, GCC and the EuroMed countries. Another key group is formed by the Least Developed Countries (LDCs) which are generally exempted from any trade liberalisation in the WTO context. The regions 17-20 in the model gather the remaining countries on the basis of geographical considerations. Compared to the other groups these groups comprise a rather mixed bunch of countries.



<b>Table 4.2 Region aggregation</b>			
	<b>Code</b>	<b>Description</b>	<b>GTAP regions covered</b>
1	NLD	Netherlands	Netherlands
2	USA	United States of America	United States of America
3	CAN	Canada	Canada
4	JPN	Japan	Japan
5	KOR	Korea	Korea
6	CHK	China and Hong Kong	China; Hong Kong
7	IND	India	India
8	RUS	Russian Federation	Russian Federation
9	BOL	Bolivia	Bolivia
10	EU26	European Union	Austria; Belgium; Cyprus; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Latvia; Lithuania; Luxembourg; Malta; Poland; Portugal; Slovakia; Slovenia; Spain; Sweden; United Kingdom; Bulgaria; Romania
11	OCN	Australia, New Zealand, XOC	Australia; New Zealand; Rest of Oceania
12	MERC	MERCOSUR	Argentina; Brazil; Paraguay; Uruguay; Venezuela
13	ASEAN	ASEAN	Cambodia; Indonesia; Malaysia; Philippines; Singapore; Thailand; Viet Nam; Rest of Southeast Asia
14	XWS	Rest of Western Asia	Rest of Western Asia
15	MED	EUROMED	Egypt; Morocco; Tunisia; Rest of North Africa.
16	LDC	LDCs	Bangladesh; Rest of South Asia; Nicaragua; Senegal; Rest of Western Africa; Central Africa; South Central Africa; Madagascar; Malawi; Mozambique; Tanzania; Uganda; Zambia; Rest of Eastern Africa; Rest of South African Customs
17	RAF	Rest of Africa	Nigeria; Mauritius; Zimbabwe; Botswana; South Africa

Table 4.2		Region aggregation (cont.)	
	Code	Description	GTAP regions covered
18	RAS	Rest of Asia	Taiwan; Rest of East Asia; Pakistan; Sri Lanka
19	RAM	Rest of South America	Mexico; Chile; Colombia; Ecuador; Peru; Rest of South America; Rest of Central America
20	ROW	Rest of World	Rest of North America; Caribbean; Switzerland; Rest of EFTA; Albania; Croatia; Rest of Eastern Europe; Rest of Europe; Kazakhstan; Kyrgyztan; Rest of Former Soviet Union; Iran Islamic Republic of; Turkey

#### 4.4 Scenarios

In order to analyse the potential gains from an EU - India FTA we need to define scenarios describing the contents of such an agreement. From the theoretical literature on FTAs discussed in chapter 2 we know that we are operating within the boundaries of the theory of the second-best. The impact of a FTA is ambiguous; the outcome of the opposing forces of trade creation and trade diversion needs to be assessed empirically. This outcome may depend on the degree of liberalisation undertaken within the FTA, as shown for a FTA between the EU and South Africa (McDonald and Walmsley, 2004).

Next to the degree of liberalisation we know from existing FTAs that non-agricultural liberalisation is generally more ambitious than liberalisation of agricultural trade. We therefore separately assess the impact of non-agricultural from liberalisation of all sectors.

McDonald and Walmsley (2004) find disincentives to liberalisation of agricultural trade by the EU within a FTA. They hypothesise that these disincentives may be reduced by global liberalisation of agricultural trade. Such a global liberalisation could be achieved through a WTO agreement in the current Doha round, depending on whether any agreed upon reductions would reduce actual protection of the agricultural sectors.

Based on these considerations we design four scenarios: (i) non-agricultural liberalisation, (ii) liberalisation of all trade, (iii) non-agricultural liberalisation when a Doha agreement is in place and (iv) liberalisation of all trade when a Doha agreement is in place. Each of these scenarios entails a series of experiments to explore the impact of differing degrees of liberalisation by the EU and India. More specific we increase liberalisation from 0 to 100 in steps of 10% for the

EU and India and compute the result for all possible combinations. This implies a series of 120 experiments or model runs by scenario<sup>1</sup>. Using this set of scenarios we can explore the incentives to (partially) liberalise for the EU and India.

*(i) Non-agricultural liberalisation*

The first series of experiments explores the incentives for non-agricultural trade liberalisation. This involves liberalising trade in the sectors natural resource extraction, textiles and leather, labour intensive manufactures, capital intensive manufactures and services. This liberalisation is done on the basis of results from a base run used to update the 2004 data in terms of the agreement on textiles and clothing and decoupling of support following the midterm review of the CAP.

*(ii) Non-agricultural and agricultural trade liberalisation*

The second series of experiments explores the incentives for agricultural trade liberalisation (i.e. in all sectors not included in the previous scenario), while assuming non-agricultural trade liberalisation is occurring.

In all experiments (including those in the non-agricultural trade liberalisation) we fixed the exports of the sector Meat (cattle, sheep, goats, horse) from India to the EU26 and the Netherlands. The database indicates a sizeable initial flow of exports from India for this sector highly protected by the EU. Looking in more detail at the COMTRADE data on which the GTAP data are based we indeed find significant exports under the HS code 0202030 (Boneless bovine cuts, frozen). However, the data look rather suspicious with the destination each year switching between different EU countries. Since large exports of bovine meat from India is rather surprising we cross-checked the data in the COMEXT database which contains more detailed EU reports of imports and exports. There we found no trace of this trade flow indicating that this is most likely a case of re-exports, i.e. a product transferred through a European port to a non-European destination. Since we are not able to determine where this trade flow is actually heading, we fixed it at the base run levels and excluded this sector in the agricultural trade liberalisations. If we would not make this adjustment to the model the changes in this sector would completely dominate all model results, which appears extremely unrealistic.

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<sup>1</sup> With such a number of experiments total solution time can take up to 7 hours. This is the main reason for using GTAP-AGR which is significantly faster than the more elaborate LEITAP model developed at LEI for which a single run can take 7 hours.

<b>Table 4.3</b>	<b>Specification of simulated Doha agreement</b>			
	<b>Developed</b>		<b>Developing (excluding LDCs)</b>	
<b>Agriculture</b>				
- export competition	Elimination of export subsidies		Elimination of export subsidies	
- domestic support	All countries 48.5% reduction in AMS, except for US and Japan (60% cut) and EU (70% cut)		All countries 32.3% reduction in AMS	
- market access	Tiered formula with 4 bands and linear cuts		Tiered formula with 4 bands and linear cuts	
	Threshold	Cut	Threshold	Cut
	0 < 20	50	0 < 30	33.3
	20 - 50	57.5	30 - 80	38.3
	50 - 75	63.5	80 - 130	42.3
	> 75	69.5	> 130	46.3
<b>Manufacturing</b>				
- market access	Swiss 10 formula: average of 50% reduction of tariffs, maximum tariff 10%		Swiss 20 formula: average of 33% reduction of tariffs, maximum tariff 20%	

*Multilateral and bilateral trade liberalisation (scenario [iii] and [iv])*

Based on the hypothesis of McDonald and Walmsley (2004) that multilateral liberalisation may change the incentive for agricultural liberalisation in a FTA, the third scenario again assesses the scope for agricultural liberalisation, assuming non-agricultural trade liberalisation is occurring. In contrast to the second scenario, however, we now do not start from the base run but instead from a situation in which a successful Doha agreement has been implemented.

To this end we simulate a Doha agreement with data from the base run. This Doha agreement is based on the state of play in the WTO agreements in July 2007 (see table 4.3). In case a range was mentioned in proposals for tariff reductions we took a simple average of these. Based on these Doha results we then re-compute the range of shocks corresponding to increased liberalisation by the EU and India in steps of 10% and rerun the experiments for both the liberalisation of non-agricultural trade (scenario [iii]) and liberalisation of all trade (scenario [iv]). Comparison with the first set of scenarios indicates whether a more or less realistic multilateral agreement changes the incentives within a FTA.

## 5 Simulation results

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The model simulations aim at uncovering trade creation and trade diversion effects with a possible EU - India FTA to derive policy implications from these. The first part of this chapter addresses the welfare evaluation for the EU and India, which provides a summary measure of the aggregate impacts. This is followed by a discussion on within-country impact in India.

### 5.1 Non-agricultural liberalisation

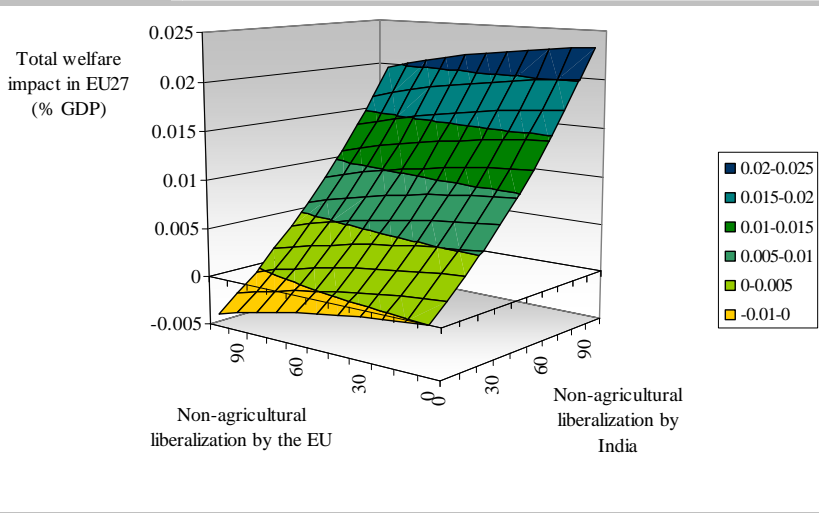
The first set of simulations assessed the impact of non-agricultural liberalisation by the EU and India. Running 120 combinations of different degrees of liberalisation we find a rather different pattern of the welfare (EV) changes for the EU and India. Each figure presents the changes in welfare as a surface. Each colour of the surface indicates a range of welfare changes. For example, in figure 5.1 the yellow indicates negative welfare changes of between 0 and -0.01% of GDP in the EU27, whereas the lightest green indicates a welfare gain of between 0 and 0.005% of GDP. The squares on the surface are based on the axes indicating the amount of liberalisation undertaken by the EU and India. If we follow the right hand side of the surface we are looking at the impact of zero liberalisation by the EU and increasing liberalisation (from 0 to 100 in steps of 10%) by India. Both the colours (greens and blues) and the upward sloping line indicate increasing welfare for the EU when India liberalises non-agricultural trade with the EU. Similarly, following the bottom of the surface we are looking at zero liberalisation by India and increasing liberalisation by the EU. The colour shift from green to yellow and a downward sloping line both indicate a loss in welfare for the EU if it is the only one liberalising.

#### 5.1.1 Total welfare impacts

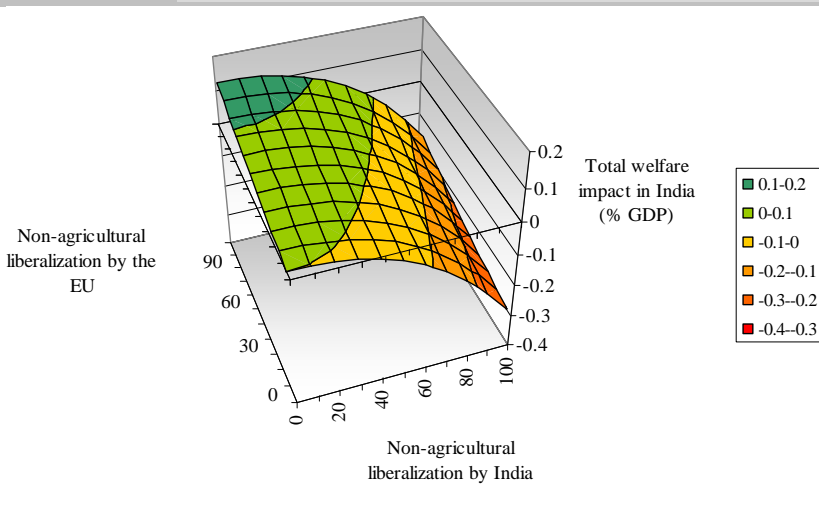
The colours in the two graphs point to a rather different impact of a FTA confined to non-agricultural liberalisation. The EU gains in about all combinations of degrees of liberalisation, except when it is the only one liberalising or if it liberalises almost fully when India restricts its liberalisation to 20%. India on the other hand faces losses in the majority of cases. Exceptions are cases where there is a limited liberalisation in India (less than 60% and then full liberalisation in the EU

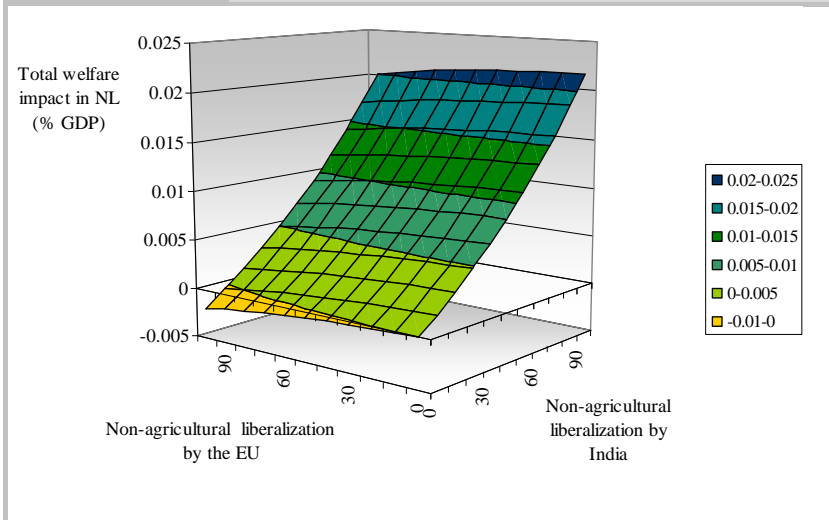
is needed to maintain a positive welfare impact), coupled with moderate to full liberalisation by the EU.

**Figure 5.1 Simulated welfare impacts of non-agricultural liberalisation on EU**



**Figure 5.2 Simulated welfare impacts of non-agricultural liberalisation on India**

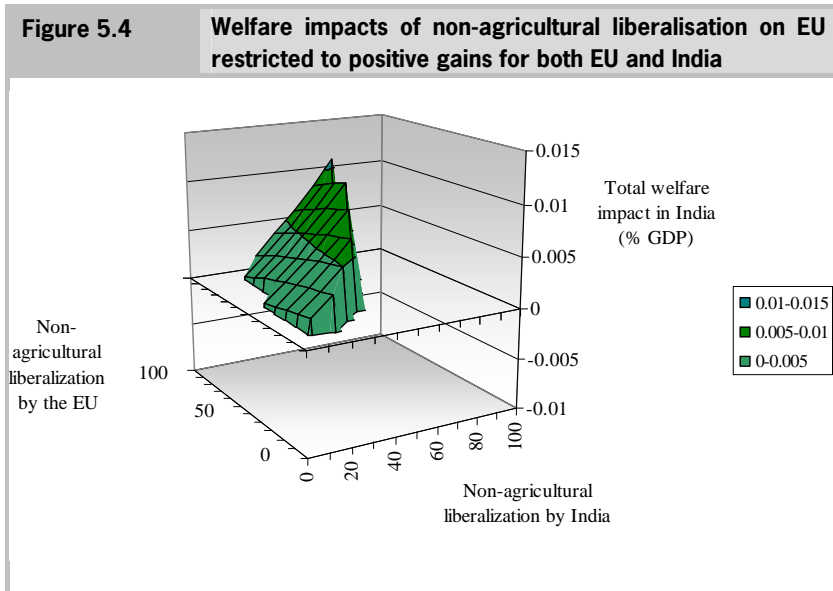


**Figure 5.3****Simulated welfare impacts of non-agricultural liberalisation on the Netherlands**

Apart from a more often negative impact on India, the size of the impact is also more pronounced than in case of the EU. In the EU the impact does not exceed 0.02% of GDP when India unilaterally fully liberalises trade. This scenario would however imply an annual 0.30% loss of GDP for India. At the other extreme, a full and unilateral liberalisation by the EU results in a loss of 0.003% for the EU and a gain of 0.14% of GDP for India. Although the gains and losses measured in dollars are larger in the EU (the maximum gain for the EU would be a little over 3 billion US dollars), the sheer size of the EU economy reduces their overall impact on the EU economy.

In figure 5.3 we present the aggregate welfare impacts on the Netherlands. The overall picture is very similar to the EU as whole. The most notable difference is that the (yellow) area with loss of welfare is smaller in the case of the Netherlands. This is in line with other studies of the impact of trade liberalisation finding a more beneficial impact on the Netherlands compared to the EU as a whole. A key reason is the prominent role of Dutch transport sectors in global trade. This implies that the increase in trade volume occurring when trade is liberalised benefits the Dutch economy through an increased demand for transport services.

Graphs 5.1 and 5.2 clearly indicate that there are opposite interests in non-agricultural trade liberalisation. Assuming that a feasible agreement needs to provide for gains for both the EU and India we can identify the part of the welfare surface where welfare increases in both regions.

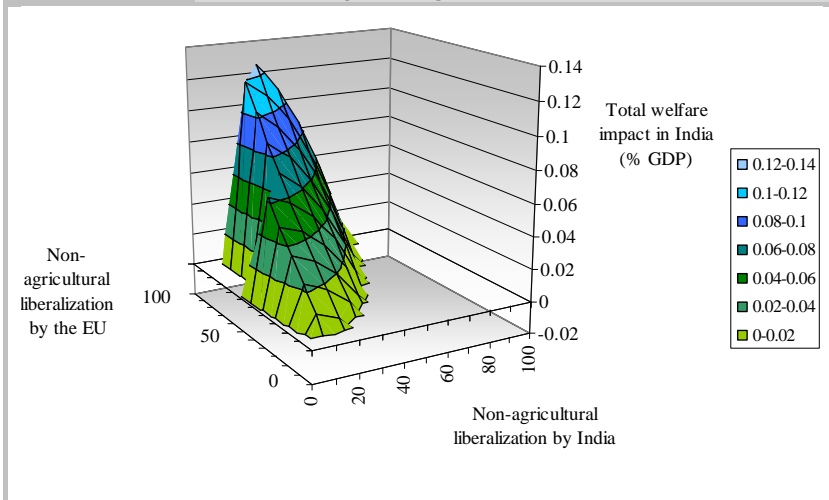


Note however that the net impact of the FTA on the EU and India is positive at all times, i.e. in all scenarios the country losing from liberalisation could be compensated by the other country. Although this total welfare gain provides a strong theoretical motivation for liberalising trade, in practice compensation is hard to implement. Identifying the area where both EU and India experience a gain in welfare may thus aid in identifying the political scope for an agreement.

The areas with positive gains for both countries still reveal opposing interests of the EU (figure 5.4) and India (figure 5.5). Comparing figure 5.4 and 5.5 we find that if non-agricultural liberalisation scenario is required to yield positive gains for both the EU and India, the maximum liberalisation of India is 70% in which case the EU needs to liberalise by 100% to yield a positive welfare impact in India. Although this scenario also yields the highest welfare increase for the EU, India would experience the highest welfare gains when restricting its own liberalisation to 30%. These findings suggest that an asymmetric agreement with the EU liberalising more than India could be rational in economic terms.



**Figure 5.5** Welfare impacts of non-agricultural liberalisation on India restricted to positive gains for both EU and India



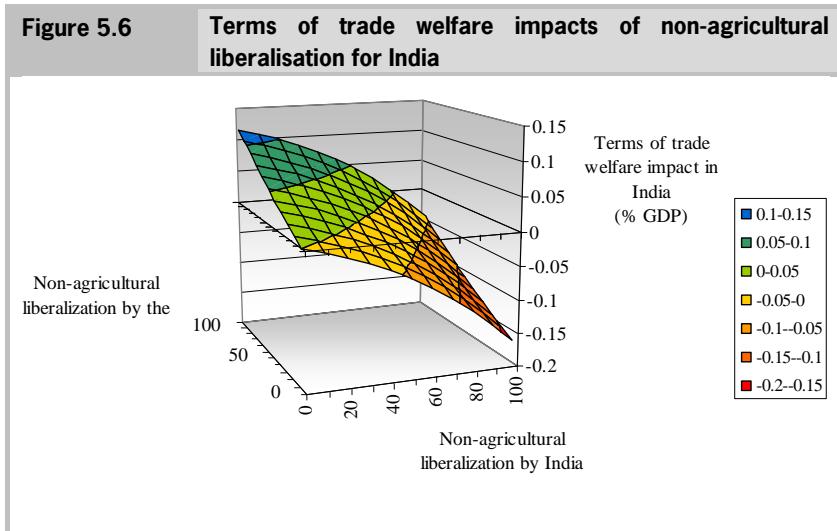
The finding that full liberalisation does not generate the highest welfare increases points to the presence of trade diversion effects. These appear to be more significant for India based on the larger areas in figure 5.2 with negative welfare impacts. Given the structure of the initial tariffs (Table 3.1) this is no surprising result. India has high initial tariffs on non-agricultural goods (about 17% on average as opposed to 1.9% for the EU) and is therefore more likely to experience trade diversion effects when more efficient suppliers are sidelined when preferential tariffs are granted to the EU. The positive and consistently upward sloping surface for the EU indicates that in case of the EU trade creation effects dominate in all scenarios. In case of India there are areas where trade creation effects dominate (the green areas in figure 5.2) and areas where trade diversion effects dominate (the orange areas).

### 5.1.2 Allocative efficiency and terms of trade effects for India

Total welfare effects for India are determined by allocative efficiency effects and terms of trade effects. To understand which of these causes the change in the total welfare impacts we graph each of these two forces.

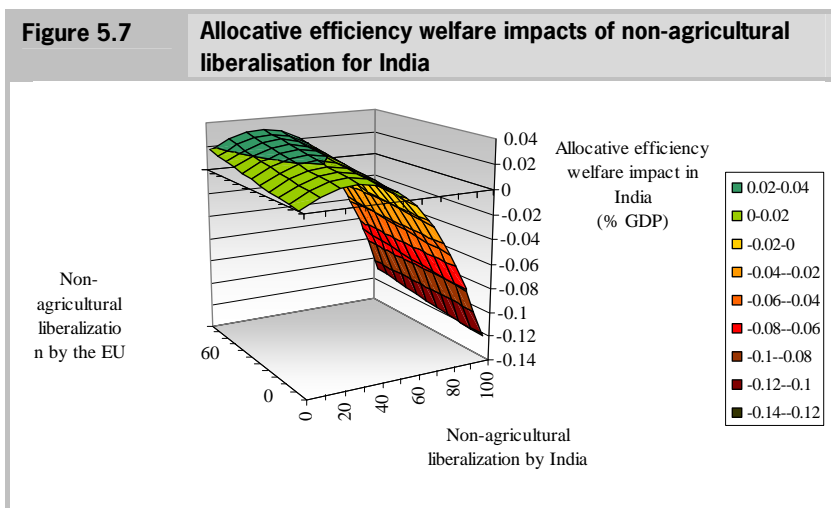
Figure 5.6 depicts welfare changes following changes in terms of trade. As is common in CGE models using the Armington assumption to model bilateral trade, the terms of trade effects account for a large part of the total welfare

impact. The terms of trade effect however does not appear to be able to account for the curved surface of the total welfare impact. The surface is a more or less flat surface due to a monotone increase in terms of trade effects when the EU liberalises and a monotone decrease if India liberalises. Base on figure 5.6 we can conclude that the terms of trade effects shift the total welfare effects up and down but do not greatly affect the shape of the total welfare surface.



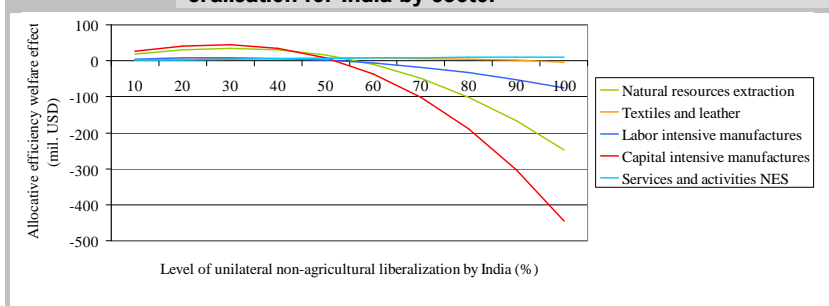
We then turn to the allocative efficiency effects for an explanation of the shape of the total welfare effects for India (figure 5.7). We find that liberalisation by the EU has a positive impact on the allocative efficiency in India: the line through zero trade liberalisation by India monotonically increases when the EU increases its liberalisation. For liberalisation by India we find a nonlinear relationship with allocative efficiency. This nonlinear relationship demonstrates the opposing impacts of trade creation and trade diversion that prohibit an unambiguous conclusion on the impact of a regional trade agreement. At first the trade creation effects of the FTA dominate but as India increases its liberalisation of non-agricultural trade with the EU trade diversion starts to dominate. At around 30% liberalisation by India trade diversions starts to balance trade creation, with 60% liberalisation trade diversion effects are dominating allocative efficiency effects. Note again that the net impacts of the FTA remains positive

despite the losses for India since the EU gains when India liberalises (see figure 5.1).



The total allocative efficiency effects are the sum of changes in each of the sectors. Figure 5.8 presents the allocative efficiency results by sector (in million USD) to assess which sectors are the main contributors to the total impact for India. Capital intensive manufacturing and natural resource extraction clearly dominate the effects in the other sectors. These two sectors show an increase in allocative efficiency up to 30% of liberalisation by India, after which trade diversion starts to dominate turning into a negative impact in between 50 and 60% liberalisation by India. Both sectors are capital intensive and therefore sourcing these from the EU is in line with the comparative advantages of both regions. The results in figure 5.8 indicate this intuition only holds to a certain extent since the EU apparently is not the most efficient supplier of capital intensive goods in the world economy and thus trade diversion starts to dominate the trade creation effects.

**Figure 5.8** Allocative efficiency welfare impacts of non-agricultural liberalisation for India by sector



### 5.1.3 Key findings from non-agricultural trade liberalisation

The analysis of the impact of non-agricultural trade liberalisation between the EU and India illustrates that not all FTAs need to be welfare enhancing. This finding is in line with the theoretical analyses of FTAs pointing to opposing trade creation and trade diversion effects. The analysis also points to opposing interests of the EU and India. Whereas it would be welfare maximising of both to strive for complete liberalisation by the EU of non-agricultural trade, there are opposing interests in terms of liberalisation by India. Assuming that any political feasible agreement needs to yield positive welfare impacts for both, India's liberalisation would be in between 30 and 70%, with the lower number maximising India's welfare.

The results also illustrate that although terms of trade effects are important for the size of the total welfare impact, the allocative efficiency effect determines the surface of the total welfare effects. Assessing sector level results we find these results to be driven by two capital intensive sectors: natural resource extraction and capital intensive manufacturing.

## 5.2 Agricultural and non-agricultural trade liberalisation

Analysis of trade liberalisation between the EU and India indicated a welfare loss in case of full liberalisation. This raises the question whether including agriculture in the agreement would change these findings. We therefore ran a set of simulations assuming full non-agricultural liberalisation coupled with different levels of agricultural liberalisation. In none of the simulations agricultural liberalisation was able to offset the negative impacts of non-agricultural liberalisation

for India. We therefore ran a new set of simulations 'optimising' non-agricultural liberalisation for India (i.e. full liberalisation by the EU and 30% liberalisation by India) combined with different combinations of agricultural liberalisation by both the EU and India.

### 5.2.1 Total welfare impacts

Using the 'optimal' non-agricultural trade liberalisation for India as a base scenario, figure 5.9 and 5.10 present the welfare surfaces when EU - India agricultural trade is liberalised as well. In both cases there are net welfare gains of the combination of agricultural and non-agricultural liberalisation. However, rather different patterns emerge.

In case of the EU adding agricultural trade liberalisation to the mix always increases total welfare, whereas for India liberalising agricultural trade more than the EU could generate net welfare impacts less than for only non-agricultural liberalisation (this is visible in figure 5.10 with some parts of the India's surface being below the point of zero agricultural trade liberalisation). The incentives for agricultural trade liberalisation for India thus depend on the actions of the EU, whereas for the EU agricultural trade liberalisation with India always yields a net gain (its welfare surface is always above the point of zero agricultural trade liberalisation).

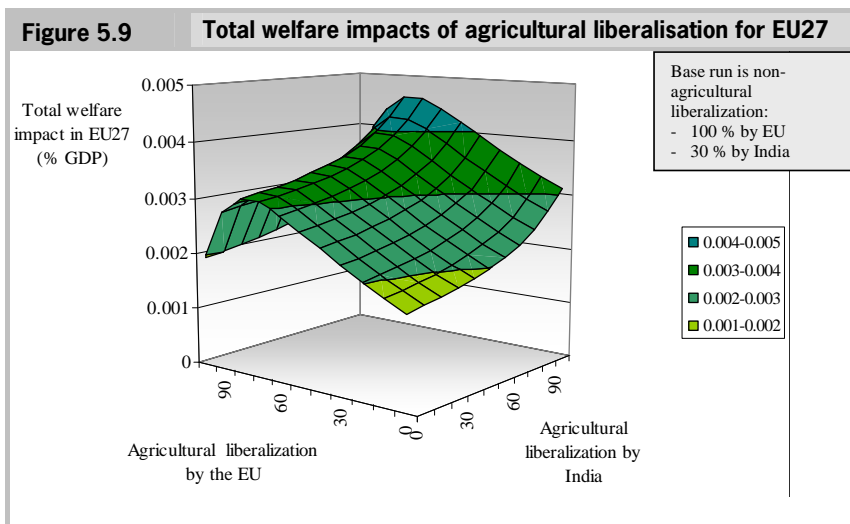
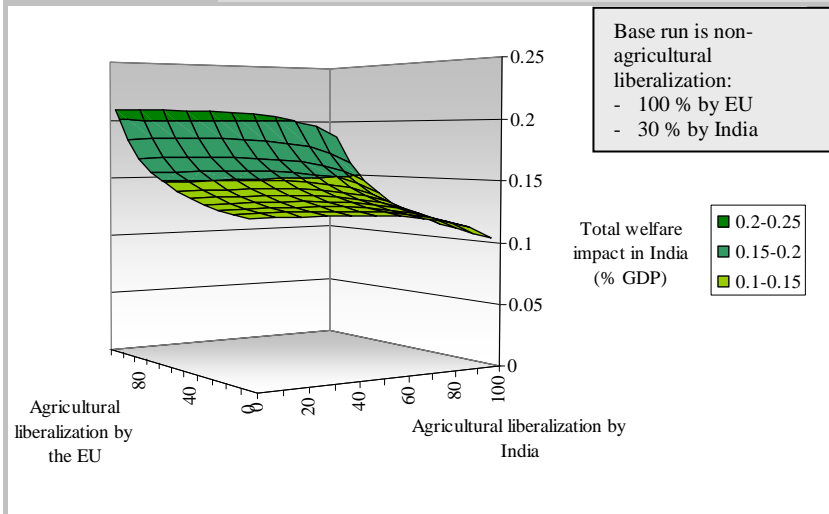


Figure 5.10

**Total welfare impacts of agricultural liberalisation for India**



Although the EU always experiences a net gain in welfare its gains increase nonlinearly with increasing liberalisation by India. It would thus be in the EU's interest to aim for full agricultural liberalisation by India. This conflicts with India's interest, which would be to reduce its own agricultural trade liberalisation to zero and aim for full agricultural trade liberalisation by the EU; India's gains rapidly increase with the level of liberalisation by the EU, whereas they decline with increasing levels of own liberalisation.

The total welfare gains for the EU show an interesting saddle-like pattern. Although the EU experiences a net gain at every level of liberalisation, the marginal benefits of liberalisation first increase rapidly, peaking at between 70 and 80% liberalisation, following by a rapid decrease in marginal benefits. This is a similar shape as found by McDonald and Walmsley (2004) for a FTA between the EU and South-Africa, although they found the 'optimal' level of liberalisation to be at about 40%.

### 5.2.2 Terms of trade and allocative efficiency impacts in the EU

Assessing the drivers of the pattern in total welfare for the EU we find no simple answer. Figure 5.11 and 5.12 present the surfaces of the terms of trade and allocative efficiency contributions to total welfare. Neither of these resembles the

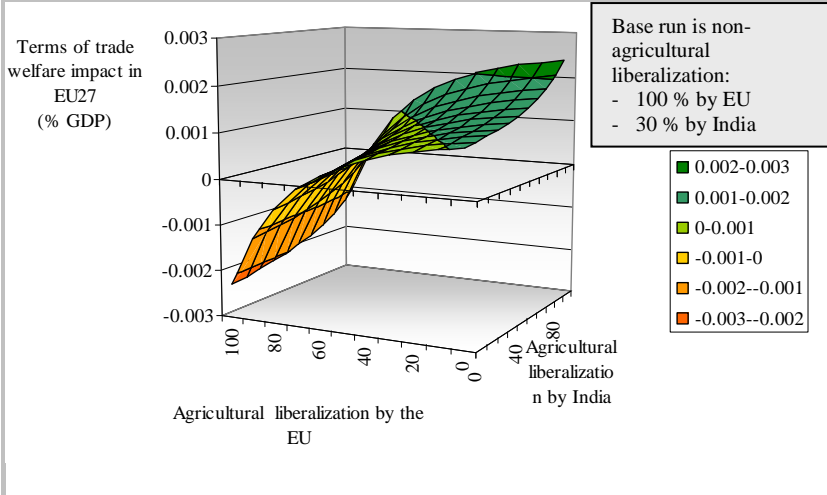
surface of the total welfare impact, although the terms of trade effects appear to be the determining factor.

Allocative efficiency effects in the EU are hardly affected by India's liberalisation, but do increase with increasing liberalisation by the EU. These strong increases coupled with the limited decreases in terms of trade effects account for the increasing part of the total welfare gains for the EU. The terms of trade effects show a fast decline in welfare for the EU with increasing own liberalisation. This decline is only to a limited extent offset by increasing liberalisation of India. Given the total welfare impacts the negative terms of trade effects start dominating the positive allocative efficiency effects at around 80% liberalisation by the EU. The decreasing rate of efficiency welfare gains, combined with the increasing rate of decline of terms of trade effects, accounts for the sharp drop in total welfare impacts on the EU.

The role of the terms of trade effect in CGE analyses is the subject of a continuing debate on the analysis of trade agreements. Brown (1987) found that these terms of trade effects are the result of a CES-based Armington specification. The implicit assumption is that each region has some monopoly power due to distinguishing goods by origin. In the current setting the assumption that policy choices affect prices does not appear unrealistic since both the EU and India are significant players in the global economy. Whether the size of the terms of trade effect is realistic is an empirical question depending on the size of the substitution elasticities in the demand functions for imports. In the model for this study we employed the standard elasticities included in the GTAP database. These are based on econometric estimations using 1999 data (see Hertel et al., 2004 for details). Due to data scarcity elasticities are not region specific, which appears an unrealistic assumption. Given the lack of empirical studies it is hard to determine *ex ante* which elasticities to use.

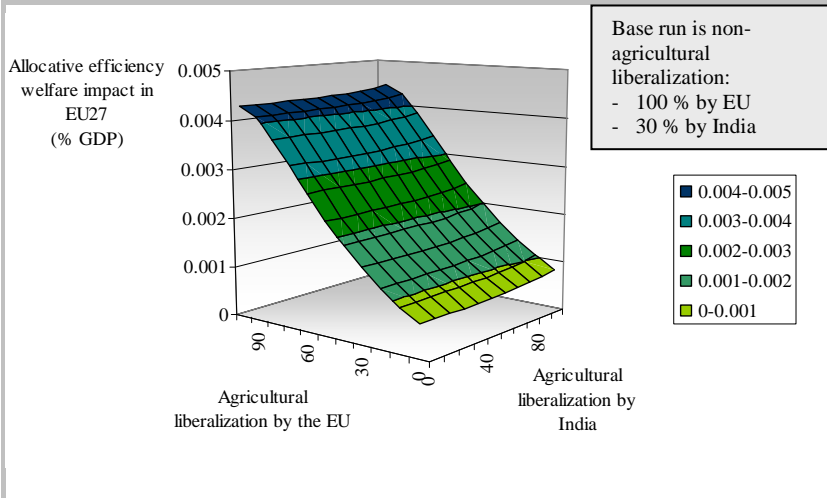
**Figure 5.11**

**Terms of trade welfare impacts of agricultural liberalisation for EU7**



**Figure 5.12**

**Allocative efficiency welfare impacts of agricultural liberalisation for EU27**





### 5.2.3 Key findings from agricultural trade liberalisation

Agricultural trade liberalisation is found to generate benefits although of a limited scale: the negative impact for India of a full liberalisation of non-agricultural trade can not be compensated by agricultural trade liberalisation. We therefore run a set of agricultural simulations based on the 'optimal' liberalisation of non-agricultural trade from India's perspective (100% by the EU and 30% by India). Results indicate limited benefits for India from its own liberalisation, which contrast with significant benefits from EU agricultural liberalisation. Depending on the extent to which the EU liberalises agricultural trade, India may be better off with only (partially) liberalising agricultural trade - even limiting reform to a 20% cut.

Benefits for the EU increase with increasing liberalisation of agricultural trade by India and are always more than only non-agricultural trade liberalisation. We do however find decreasing marginal benefits of agricultural trade liberalisation beyond 80% for the EU, due to negative terms of trade effects for the EU. The incentive for the EU to limit its own agricultural trade liberalisation is due to large country optimal tariff effects. These disincentives are likely to be reduced by a global round of liberalisation, as aimed for in the current Doha negotiations.

Thus we arrive at a selection of four 'optimal' solutions out of the 240 simulations on which the welfare discussions were based, presented in table 5.1.

<b>Table 5.1 Income effects under 'optimal' scenarios a)</b>				
<b>Scenarios:</b>	<b>(Depth of liberalisation in% under selected scenarios)</b>			
	<b>India maximises gains</b>			<b>EU maximises gains</b>
	<b>only non-agricultural</b>	<b>non-agricultural b) &amp; agricultural</b>	<b>only non-agricultural</b>	<b>non-agricultural b) &amp; agricultural</b>
EU tariff cut on imports from India	100	100	100	80
India tariff cut on imports from EU	30	20	70	100
Simulated effects	(% of GDP)			
<i>EU</i>	<i>0.002</i>	<i>0.002</i>	<i>0.011</i>	<i>0.005</i>
<i>India</i>	<i>0.126</i>	<i>0.209</i>	<i>0.017</i>	<i>0.145</i>

a) Welfare effects based on the equivalent variation measure; b) Agricultural liberalisation scenarios combined with non-agricultural liberalisation scenario EU\_100/India\_30.  
Source: model simulations.

For the non-agricultural liberalisation scenarios the 'optimal' solutions are: 100% liberalisation by the EU coupled with 30% and 70% liberalisation by India. For the agricultural liberalisation scenarios these are: 100% by the EU with 20% by India (India's 'optimum') and 80% by the EU and 100% by India (EU's optimum).

### **5.3 Within country effects of trade liberalisation: India**

The discussion so far focused on welfare impacts as indicators of economic impact. Several analysts criticise the reliance on welfare indicators for policy purposes, particularly in a developing country context. Notably, Taylor and Von Arnim (2005) argue that these welfare measures by definition are small and therefore of limited interest but hazardous in hiding possibly large distribution effects. Welfare gains for a country as a whole may imply that some sectors or groups in society lose whereas others gain. Welfare measures and global economic models that produce them are particularly useful in understanding drivers of change in employment and wages. On another level, the distribution of benefits within a country is of key importance in political decisions on trade agreements. Although in theory a net welfare gain for a country implies that the winners could compensate the losers, such compensation appears to be difficult to arrange in practice. Furthermore, differences in political power of sector or societal groups are reflected in the decision making. If powerful groups stand to lose from a potential trade agreement such an agreement is less likely to materialise.

In the following we therefore present some key country level results: prices of production factors, sectoral output and trade flows. To keep the presentation legible we need to select a number of simulations from the 240 runs on which the welfare discussions were based. For the non-agricultural liberalisation scenarios we take the two 'optimal' solutions: 100% liberalisation by the EU coupled with 30% and 70% liberalisation by India. For the agricultural liberalisation scenarios we take the 100% by the EU with 20% by India (India's 'optimum') and 80% by the EU and 100% by India (EU's optimum). As before the two agricultural scenarios are run on the basis of full EU and 30% reduction by India in the non-agricultural sector.

### 5.3.1 Factors of production

Price changes serve as transmission mechanisms in bringing about changes to the economic structure after a reform of policies. An FTA works directly on international prices (export prices, import prices and the terms of trade), which have effects on domestic prices as the goods and factor markets of production adjust. The depth of the perturbations in the economic system in India and the EU indicates the possible economic impact of a trade agreement between the regions.

Of particular interest are the effects on the returns to labour (skilled and unskilled), capital (credit) and land, i.e. the factors of production. According to a generic setup of multi-sector models, changes in the economic structure after policy reform are driven for a large part by alterations to the relative returns of labour, capital and land in each economic activity. In the model we assume that in equilibrium the factor prices correspond to their return. Shifts in the overall factor prices correspond to structure changes in the overall economy.

From that perspective, figure 5.13 is particularly informative on the asymmetric impact of the EU - India trade agreement in EU and India. The leftmost panel shows that overall factor prices in the EU are unaffected across the set of policy scenarios, with the exception of declining land prices under an agriculture-inclusive FTA. We conclude that the EU economy remains essentially unperturbed by integration with India. This observation confirms the smallish scope for welfare gains to be had in the EU. In turn, India's integration with the EU will induce economic change, as flagged by developments in Indian factor prices. Moreover, the economic impact varies substantially with the depth of the FTA. Given that the stakes in an FTA are much greater and more varied for India than the EU, we take the Indian perspective in the remainder of this section.

Factor prices in India show a tendency to rise, for almost all factors in all scenarios. Factor price rises under a manufactures-based FTA are in the order of 0.2 to 0.6%, and rather uniform but with wages rising more than the prices of land and capital - in particular for unskilled labour. A modest rise in land prices points to some repercussions for the agriculture sector, in particular to an expansion of the area under cultivation. Interestingly, under an agriculture-inclusive agreement, land prices respond quite dramatically with increases of over 1 to 2%. In combination with a minor increase or drop in skilled wages and capital prices these are signs of an economic restructuring away from industrial production and towards agriculture and labour-intensive manufacturing.

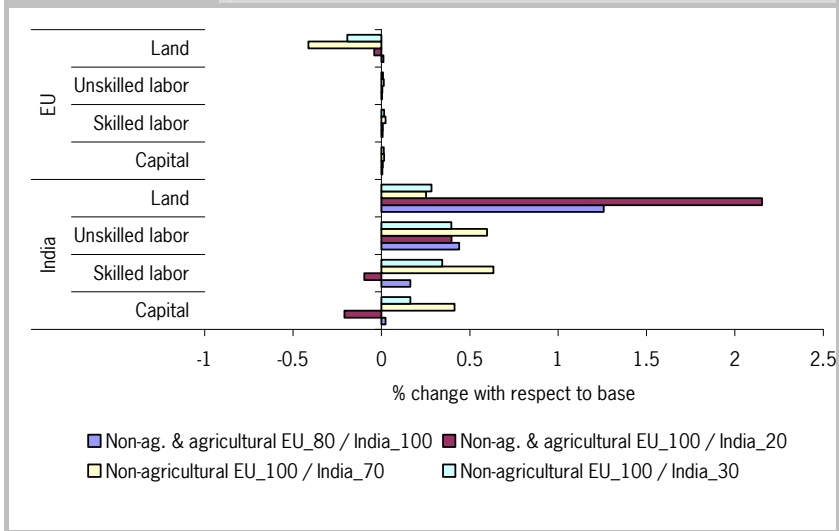
One further remark is appropriate before we describe the impact on the economic structure, in terms of trade and output. Factor price developments

provide indications of the equity effects of a trade reform. India features widespread poverty and unemployment. It is widely agreed that the most vulnerable groups in society are landless rural workers and the urban unemployed. Access to a formal or informal job position provides the best outlook for a move out of poverty. Hence, from a poverty-reducing perspective we are particularly interested in a trade policy that boosts the demand for unskilled labour. However, there is wide acceptance that economic growth per se, if constant at a high rate for a longer period of time, is an ideal condition for poverty reduction in the long run. By implication, an ideal trade policy strikes contributes to increased employment on the short term and strong growth in the long run.

The simulation results point to the possible inconsistency between a trade policy geared at strong growth and a policy for job creation cum poverty reduction. If India concludes a trade agreement with the EU, the welfare-maximising policy - given full liberalisation by the EU - is to open up manufactures trade by 30% and agricultural trade by 20%. However, such a policy would create large rents for land owners while having a limited (yet positive) pull on unskilled labour. The greatest gains to landless and urban labourers, and possibly the biggest poverty alleviating effects, are achieved under a 70% liberalisation of manufactures trade, leaving agricultural protection at the status quo. This policy maximises unskilled labour demand in textiles, pushing wages by 0.6%, but the welfare gains approach nil due to strong trade diversion effects. These are indications that trade policies in India feature a trade-off between welfare maximisation - a proxy for a strong-growth policy - and poverty alleviation, pressing the need for the government of India to strike a balance between these potentially conflicting goals.

**Figure 5.13**

**Factor price changes in EU and India under various scenarios**



### 5.3.2 India's opening up to manufactures

Under a 30% cut of applied protection, manufactures imports from EU into India expand strongly. To a large extent this trade, both labour intensive (light) manufactures and capital intensive manufactures (durable consumer goods but also capital goods), replaces imports from other regions of the regions, as reflected in reductions in imports from the rest of the world.

#### *Trade*

The simulations suggest that the EU - India agreement will be particularly instrumental in promoting India's imports of capital intensive manufactures from the EU (appendix tables A1.3 to A1.6 provide detail on trade effects under various FTA scenarios). This comes to no surprise as the EU accounts for 25% of all imports of such industrial goods already, and the FTA strongly improves the competitive position of EU exporters vis-à-vis exporters in the rest of the world. Under the FTA, some exports from the EU exporters replace exports from other exporters. However, in volume terms the expansion of exports from the EU exceeds the decline in exports from countries in the rest of world outside the preferential scheme. The simulations suggest that trade creation, i.e. the net

positive effect, for capital intensive manufactures could amount to USD 1.4 billion under a 100/30 cut and USD 3.1 billion USD under a 100/70 cut. Such results indicate the possible scope of the deepening economic integration between India and the EU.

EU exporters of manufactures fare well under such a policy change, as they see the EU market share in total Indian imports rise substantially – to 39% for labour intensive manufactures and 27% for capital intensive manufactures (table A.4).

If we assume, as the model does, that the total balance of payments is fixed, then the currencies to afford rising imports need to be collected by means of an expansion of exports.<sup>1</sup> There is an important limitation of this model setup for the analysis of a free trade agreement: by and large, both partners of the agreement are to obtain equivalent trade expansion.<sup>2</sup> The results suggest that India depends largely on textile exports to the EU, which double in all simulations. Exports of other manufactures also expand, but not as dramatically.

The doubling of India's textile exports into the EU is the result of the enhanced competitiveness of Indian garments vis-à-vis competitors, particularly Chinese make. Is it likely that the FTA will have such a booming impact? Prime evidence comes from a view of the depth of the FTA and trade shares of Indian garments. Before the FTA, EU levied an average 7.2% tariff (ad valorem equivalent) on textiles imports from India, substantially higher than the 4.4% average for all importers. In the scenarios under scrutiny, the EU completely eliminates the tariff on Indian garments, and measures for other exporters remain the same. Thus, in such a setting Indian exporters jump from a disadvantageous base to a preference margin vis-à-vis competitors exceeding 4%. In a setting of price-based competition, such a policy change is a potentially strong driver of trade growth - particularly if India's textile sector is not the global least-cost producer. The plausibility of the projected boost of Indian textile exports into the EU is further improved by a limited initial share of Indian garments in EU im-

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<sup>1</sup> Actually, India is running a structural deficit on the trade balance, which implies that India finances a surplus of imports over exports with incoming capital flows.

<sup>2</sup> The terms of trade with trading partners outside the agreement change only in as far as the FTA affects domestic factor markets in EU and India and the transmission of these effects into prices for tradables - apart from effects via commodity markets where either India or EU are price setters and the FTA affects the trading price. In contrast, under a global trade reform the terms of trade will change with all trading partners a priori because of the uneven distribution of the global cut. This implies large scope for adjustments to the pattern of international specialisation.

ports. The doubling of imports from India to the EU represents no more than a rise in the share of all imports to 2% (Table A.3).

A FTA makes economic sense when it allows a further integration between two 'natural' trading partners. A prime test is whether the trade integration results in a more productive allocation of resources across both trading partners.

The results indicate that the opening up of EU markets for Indian goods creates very little scope for allocative efficiency gains in India. There are some gains in textiles, but the output effect is limited, and the adjustment in the textiles industry is not much more than a reorientation of trade from rest-of-world destinations towards the EU. Moreover, the efficiency gains evaporate under deeper cuts; as India slashes more than 50% tariffs on imports of EU origin, trade diversion effects and associated efficiency losses start to kick in. By implication, an EU - India FTA provides few leads for achieving major efficiency gains via adjustments to the pattern of international specialisation; most probably India can find more suitable FTA partners.

Terms of trade effects dominate the welfare analysis for India in most of the simulations. There is ample scope for terms of trade gains when EU opens up but this scope disappears as India liberalises its own trade policies. Positive effects are driven by a reduction in the barriers on imports of manufactures in the EU, which creates a demand expansion that pushes up textile prices in the EU. (The growing EU demand for India's textiles is too small to result in upward pressure on the world market price for garments.) In combination with the export boom for Indian garments, positive and large terms of trade effects result. On the negative side, India purchases more expensive capital-based goods from the EU that replace previous imports from other trading partners.

### *Output*

Textiles output in India expands in order to accommodate the increasing foreign demand. In the particular case the model signals a possible relocation of textiles production from the EU into India, which could refer to current pockets of low-cost garment production in the Eastern European member states. In India, the demand for the main factors of production (unskilled labour and capital) increases proportionally with the expansion of output. By assumption the rising demand for labour in the textiles sector will bring upward pressure to the wage rate in this sector. This will then drive a relocation of labour into the textiles industry. Probably, however, the analysis underestimates how large-scale unemployment erodes wage effects and labour mobility.

The model indicates limited changes to the structure of textile production. The textile industry's increasing demand for cotton and other natural fibres is

satisfied largely through an expansion of domestic cotton production (presented in table A.2, row heading plant-based fibres). Cotton and fibre imports also rise. The effects on the synthetic fibres market remain intangible. In the long run such substantial output change will generally affect the labour and capital intensity of production through inducing technological change. Such long term dynamic effects are not included in the model used for this study.

The repercussions of the boost of textile exports on the agricultural sector are limited yet not negligible. The simulations suggest a minor drop in the production of primary crops, primarily due to a shift of labour and land resources into growing cotton and natural fibres. Just a few hands will move out of agriculture into manufacturing. Food self-sufficiency is projected to reduce by 1-2%, such that agricultural imports must expand in order to meet domestic demand.

### 5.3.3 Including agriculture in the FTA

If we expand the scope of the FTA to include agriculture, the textiles boom is moderated a bit by an expansion of Indian agricultural exports to the EU. Notably, the simulations suggest that India may start exporting crops to the EU, rice and sugar in particular, after the EU removes its tariff barriers on Indian agricultural goods.

#### *Linkage effects*

The overall linkages of these changes to the overall economy are limited. An indication is that under the extended FTA India's agriculture is just slightly more trade-oriented than before. Agricultural openness, measured by the ratio of agricultural imports and exports to overall GDP, increases modestly from 2.2% of GDP to 2.5-2.6% of GDP. This is largely due to an increase in exports. The implications of such a shift on the balance of payments, or the concomitant impact on the real exchange rate of the rupee are minor at most.<sup>1</sup>

#### *Agricultural trade and output*

The simulations suggest that the full FTA will induce rising shares of India in global agricultural trade, particularly for food crops. The trade effects largely occur between the India and the EU, and the implications on other trade partners are minor in general.

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<sup>1</sup> Such a low level of openness points to the limited scope of WTO policies vis-à-vis domestic ag policies.



The projected expansion of agricultural exports, involving dramatic increases of exports into the EU, is concentrated in a few sectors: sugar, rice (paddy and processed), meat products nec, dairy products and food product nec. We see declining exports in the other sectors as well as a reduction across the board of agricultural exports to the rest of the world. Both provide indication that including agriculture in the FTA may induce a changing position of India in the pattern of global agricultural specialisation. There are two directions of change.

First, India's agricultural exports become substantially more EU-oriented and divert away from the rest of the world. The rightmost panel of table A.6 shows large jumps from the initial share of the EU in India's exports to the share under an agriculture-including FTA in quite a few sectors. The drivers for a redirection of trade to the EU are particularly strong for the complete set of 'growth commodities' mentioned above.

Second, the specialisation is targeted in two crop-based sectors yet including both the primary and processing activities (see figure 5.14). Sugar expansion is highly dramatic but we must largely interpret this as an artefact of the model, and not a feasible result. It is due to the notorious complexity of EU sugar trade policies, and the incomplete representation of the policies in the model and the data (Van Berkum, Roza and Van Tongeren, 2005). Another reason for scepticism over the implications on the global sugar market is that India is not established as a major sugar exporter from the outset. For this reason we are not confident in the feasibility of this particular result, and we do not explore it further.

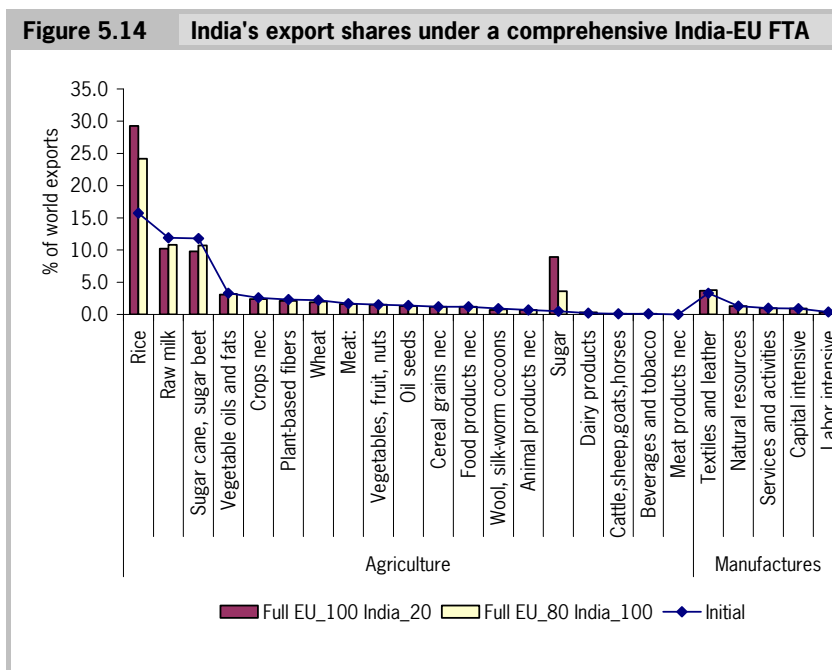
The FTA pushes India to strengthen its substantial position in the global rice market as a major rice exporter. In dollar value, India is the second largest exporter of rice in the base, well behind the ASEAN region, and just ahead of the US. India's rice exports largely involved processed rice of high value and quality.

A surprising result from the simulation is that global rice trade expands under the FTA. The combined global rice trade is projected to expand from a base of USD 8.5 to 9.1 billion under EU80 and even 9.6 billion under EU100 (excluding EU intra trade).<sup>1</sup> India's share of the global market explodes. India's share of global rice exports, for all rice, is projected to expand from 16% to 24% under EU80 and further to 29% under EU100. The EU is, of course, largely absorbing the expansion India's rice exports. The share of Indian imports into EU is pro-

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<sup>1</sup> The simulations suggest a restructuring of India's trade towards a greater share of paddy trade. However, this is an artefact of the database: paddy rice is a non-tradable good due to its perishable nature, and the database entries for paddy rice erroneously include the 'rice in the husk', a tradable good. We report on rice sector aggregates in this section. In the base, bulk rice in the husk comprises a mere 10% of exports, and this is projected to rise above 25% under EU80 and EU100.

jected to rise from 1.8% of global rice trade to 12% under EU80 and 18% under EU100. Indian exporters may divert a limited share of exports away from other key export markets in Bangladesh and other least developed countries and Western Asia (label 'xws'). Most of the expansion, however, is made possible by an increase in India's rice output. Because of the very large volume of domestic rice production in India relative to the global rice market - the total volume of global rice trade is but one-fourth of India's domestic supply - a limited output expansion has tremendous impact on the global rice market. Total rice output is projected to increase by about 2.2% under EU80 and 4.1% under EU100. The presentation of export shares in figure 5.14 shows that the expansion of rice output and exports does not compromise India's share in other markets.



#### 5.4 Impact of a Doha round on incentives for a FTA

This section briefly explores how a successful multilateral reform under the WTO Doha round affects the possible interests in India and EU in an FTA. We repeated the two scenarios discussed in detail above under the assumption that

the globally tariffs are reduced due to a successful conclusion of the Doha round of WTO negotiations.

#### 5.4.1 Non-agricultural FTA with a Doha agreement in place

Graphs 5.15 and 5.16 below show (welfare) results of runs simulating non-agricultural trade liberalisation in the context of a successful Doha agreement, and are to be compared to figure 5.1 and 5.2.

We find similar shapes of the two welfare surfaces which implies that the same mechanisms are at play as discussed before. In the case of the EU the already very limited welfare gains found earlier are further reduced, maximum gains go down from 0.02% of GDP to 0.01% when a Doha agreement is in place. The lower tariffs resulting from a Doha agreement reduces the scope for gains to be reaped from a FTA with India. In the case of the 'optimum' non-agricultural liberalisation from an Indian perspective (100% liberalisation by the EU and 30% by India) the welfare impact on the EU economy drops to about zero.

In the case of India we also find lower potential welfare gains, dropping from 0.14% to 0.09%. The scope for welfare gains for India thus remains larger for India. The implementation of a Doha agreement not only lowers the gains to be had from a FTA with the EU but also the potential losses from trade diversion. By reducing the tariffs of India, a Doha agreement reduces the preferential margin for EU exporters to India in a FTA and therefore the scope for replacement of more competitive suppliers not enjoying the preferential treatment European suppliers. The maximum loss for the Indian economy (when India would unilaterally remove its barriers on EU imports) drops from 0.3% of GDP to 0.13% of GDP.

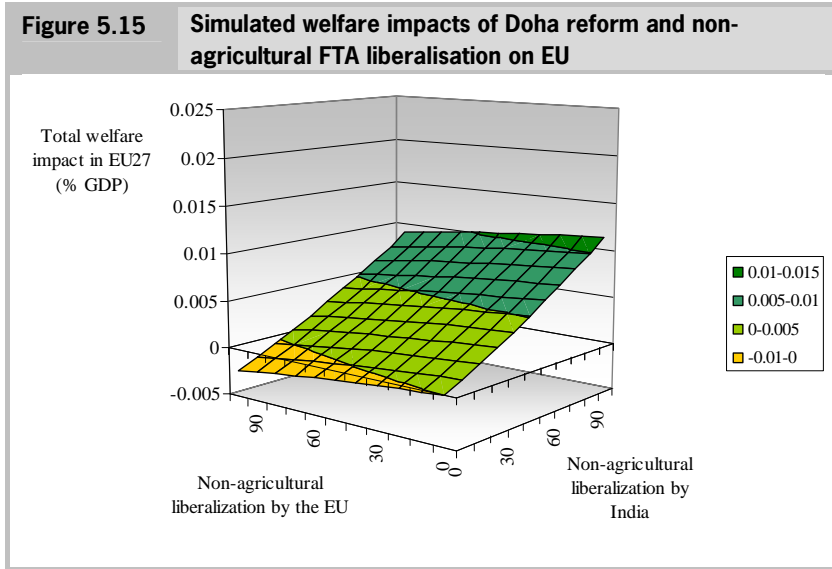
Based on the aggregate welfare impacts we can thus conclude that a Doha agreement would make the aggregate impact of a FTA with India on the EU negligible. In the case of India the maximum welfare loss is reduced more than the maximum welfare gain. This implies that although a Doha agreement reduces the incentives for engaging in a FTA, by reducing the maximum potential losses for India it increase the incentives for India to engage in a FTA.

#### 5.4.2 Agricultural and non-agricultural FTA with a Doha agreement in place

We also repeated the simulation of liberalisation of all (agricultural and non-agricultural) trade with a Doha agreement in place. Graphs 5.17 and 5.18 below show (welfare) results of runs simulating non-agricultural trade liberalisation in

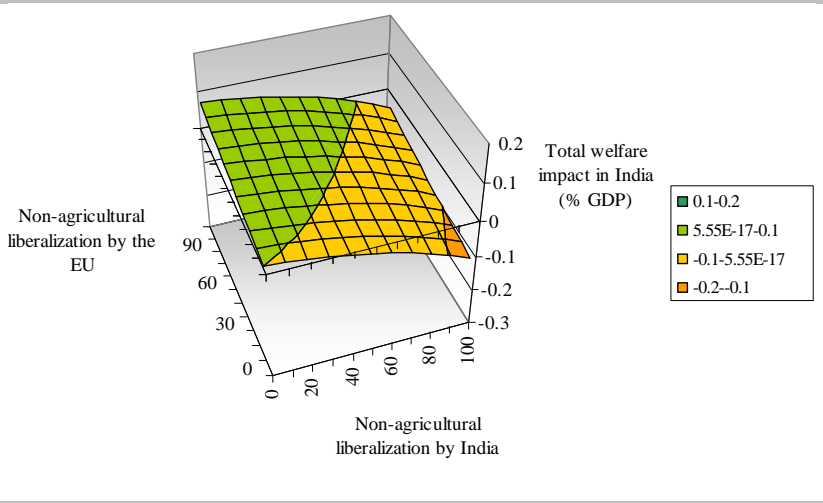
the context of a successful Doha agreement, and are to be compared to figure 5.9 and 5.10.

For the EU we again find a saddle-like pattern but much less pronounced than in figure 5.9. This already suggest that a global reduction in tariffs through a Doha agreement reduces optimal tariff effect for the EU.

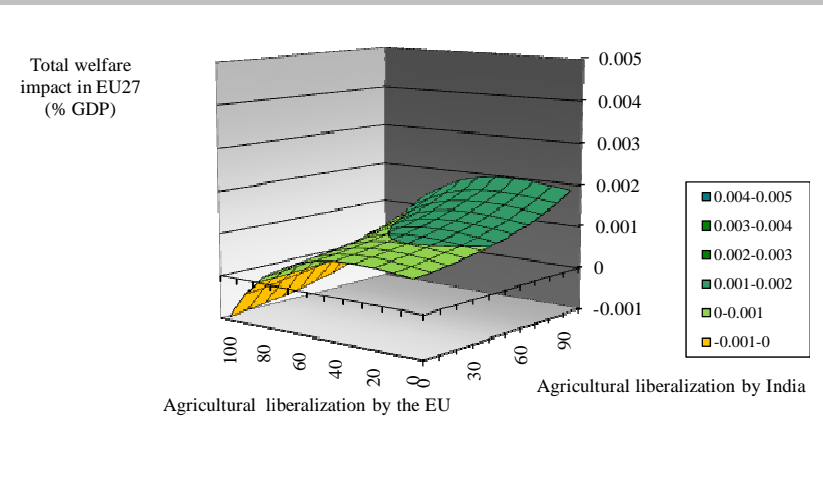


However, at the same time the 'optimum' level of tariff reduction shifts from between 70 and 80% without a Doha agreement to around 40%. This is the same level as found by McDonald and Walmsley (2004) for a FTA between the EU and South-Africa. The hypothesis of McDonald and Walmsley that multilateral liberalisation changes the incentives for agricultural liberalisation is thus confirmed. We find that agricultural liberalisation with a Doha agreement in place reduces total welfare gains and reduces the 'optimal' amount of liberalisation for the EU, compared with a situation without a Doha agreement.

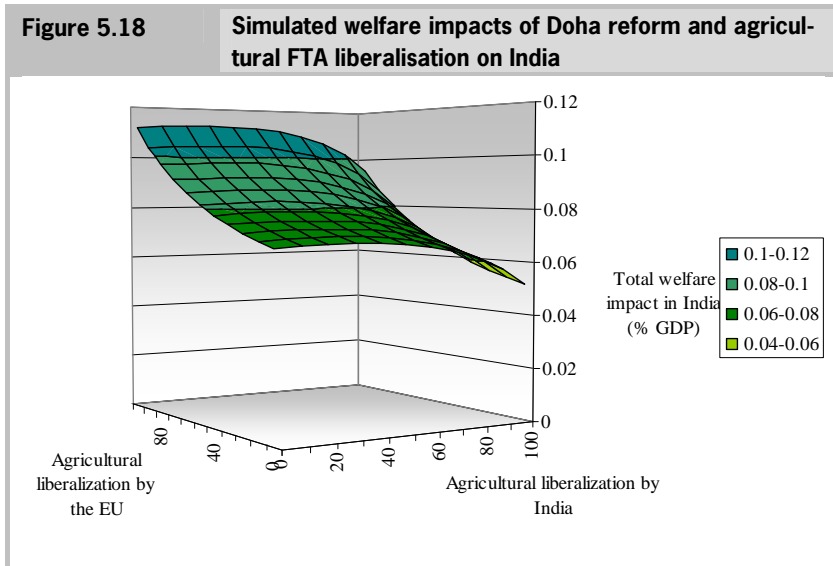
**Figure 5.16 Simulated welfare impacts of Doha reform and non-agricultural FTA liberalisation on India**



**Figure 5.17 Simulated welfare impacts of Doha reform and agricultural FTA liberalisation on EU**



In the case of India we do not find any changes in the pattern of welfare changes with varying degrees of liberalisation (figure 5.17). The welfare surface is shifted down to about half the impact found of liberalisation of all sectors without a Doha agreement (figure 5.10). Multilateral liberalisation thus reduces the incentives for a FTA with the EU, but does not changes the incentives for a particular level of liberalisation.



## 6 Conclusions

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This study examines a possible arrangement between the EU and India, as a case study on the interests of developing countries in a free trade agreement (FTA) with high-income partners. Its aim is to examine the interests of both parties in slashing tariffs on bilateral merchandise trade. Of particular interest are the implications for agricultural markets, given the tension between agricultural liberalisation and India's policy goals relating to self-sufficiency in food grains and poverty reduction. The analysis employs a global economy-wide model (GTAP-AGR) using a recent database. Elements of 'deep' economic integration, which relate to regulatory harmonisation, the facilitation of cross-border services trade and investment and so on, are not examined.

The macroeconomic effects of changes in policies are assessed by the well-established welfare economic compensation measure. Since the impact of FTAs are ambiguous, the outcome of the opposing forces of trade creation and trade diversion needs to be assessed empirically. India's interests in a regional trade agreement with the EU are downplayed by the fact that India's economy is not well integrated in global markets. Particularly agriculture is a closed sector by all measures. India's main offensive interest in an FTA with the EU concerns tariff concessions for industrial products (textiles in particular), and much the same goes for the EU vis-à-vis India. Possible defensive interests are evident from India's current tariff schedule and structure of imports, which point at possibly large trade diversion effects under an agreement with the EU and displacement effects as domestic producers suffer from the increased competition of imports from the EU. Such effects, combined with the pivotal role claimed for agriculture in livelihood strategies of the poor and vulnerable, explain why agriculture plays a marginal role in India's bilateral and regional agreements and is excluded in most cases.

An interpretation of the simulated welfare effects, combined with a review of the effects on factors of production, output and trade, leads to the following conclusions:

'The overall interests of India in a trade deal with the EU that slashes tariffs on bilateral merchandise trade are limited, although specific risks and gains are present.'

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. A stronger economic rationale for a free trade agreement with the EU is possibly found in the benign effects of 'deep' economic integration, i.e. a move towards an economic space where goods and capital move without barriers under jointly shared rules - but these have not been examined. The impact of tariff reduction under a possible EU - India free trade agreement involves potential losses from a far-reaching FTA with the EU. The EU, an important source of industrial imports for India, will expand its position on the Indian market in the area of industrial goods and extraction goods, particularly at the expense of lower-cost producers in Asian countries. The EU is hardly a logical trading partner for more labour-intensive manufactures or for agricultural products from the perspective of production costs. The widely feared displacement of domestic production by imports of EU origin appears limited, however, and few Indian jobs are directly at risk. As far as offensive export-related interests are concerned, the study finds gains related to improving the access for export products to the EU market, reducing input costs for export industries in parallel with improved access to high-quality input. This transfer of technology is intertwined with an agenda for direct investment into India. Particular product related offensive interests explored in model simulations conditional on the EU opening up markets involve textiles, cotton for intermediate deliveries to textiles industry, rice, and possibly sugar.

'The EU economy remains unperturbed by integration with India.'

The simulations indicate limited scope for welfare gains in the EU, but on the other hand no major welfare losses either. Sector-specific interests include offensive interests in capital-intensive manufacturing and natural resource extraction (presumably oil and fuels). Offensive interests for an agriculture-inclusive deal are present in the fruits and vegetables sector.

'The estimated positive impacts from an EU - India FTA erode under a successful global trade reform embodied by a possible Doha agreement.'

As expected, a global reform reduces the potential gains for India from an FTA with the EU and, at the same time, narrows the scope for trade diversion and concurrent efficiency losses. For India, a moderation of the risk of strong losses could provide leeway to embark on a track of bilateral integration with the EU despite a strong economic rationale. In the EU, multilateral liberalisation reduces the incentives for a FTA with India, but it does not change the incentives



for a particular level of liberalisation. For the EU we find even smaller welfare gains with a Doha agreement in place, but also the optimal level of liberalisation of agriculture reduces from 80 to 40%.

'An EU - India agreement on merchandise trade is unlikely to embody substantial preferential treatment with regard to market access.'

If the welfare analysis outlines the feasible options for trade integration between India and the EU, the arrangement would be characterised by a strong asymmetry: even though full liberalisation of agriculture by India would be 'optimal' for the EU (see table), this is still combined with a strongly asymmetric liberalisation of non-agriculture (100% by EU and 30% by India). The analysis indicates that it would be in the interest of both partners if the EU provides large concessions to India for access to its markets, while India keeps the bulk of current border protection. This finding contrasts with the current trade policy of the EU which focuses on reciprocal trade agreements, and it is potentially conflicting with WTO rules that require a FTA to cover 'substantially all the trade' between the constituent members. It is therefore likely that an EU - India agreement will embody a wide coverage of merchandise trade, even if excluding from its coverage sensitive areas in agriculture and textiles like many other FTAs. At the same time, the depth of preferential treatment on market access that India and the EU will grant to imports from their FTA partner will probably be modest, and engineered towards specific benign impact in certain areas.

'Agriculture is a key sector for India in the consideration of equity and growth purposes of a FTA with EU.'

India's welfare-maximising policy, given full liberalisation by the EU, involves a 30% cut of agricultural import tariffs for EU products and a 70% cut of tariffs on other merchandise trade. Agricultural reform creates large rents for landowners, and has a limited pull effect on unskilled labour. This strategy maximises income gains (an approximation of economic growth), and it generates small but positive effects on poverty alleviation. A maximisation of poverty alleviation effects requires an alternative policy, i.e. a deeper liberalisation of manufactures trade while leaving agricultural protection at the status quo. This policy, basically a textiles-oriented export strategy, results in a pull of unskilled labour demand in textiles and cotton farming, resulting in positive employment (or wage) effects for landless and urban labourers. Substantial poverty alleviating effects are achieved, however, at the expense of income gains due to strong

trade diversion effects. These are indications that trade policies in India feature a trade-off between a strong-growth policy and poverty alleviation, pressing the need for the government of India to strike a balance between these potentially conflicting goals.

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# Appendix A

## Results tables

**Table A1.1** Prices of production factors by country and scenario (% change with respect to base) a)

	Prices of production factors by country and scenario (% change with respect to base) a)												
	EU				India				Netherlands				
	non-agricultural	non-agricultural & agricultural a)	non-agricultural & agricultural a)	non-agricultural a)	non-agricultural	non-agricultural & agricultural a)	non-agricultural a)	non-agricultural	non-agricultural & agricultural a)	non-agricultural	non-agricultural & agricultural b)	non-agricultural b)	
Cuts: EU	100	100	100	100	100	100	100	100	100	100	100	100	80
India	30	70	20	100	30	70	20	100	30	70	20	100	100
Land	0.01	-0.04	-0.41	-0.19	0.28	0.25	2.15	1.26	0.01	-0.06	-0.41	-0.20	-0.20
Unskilled labour	0.00	0.01	0.01	0.01	0.40	0.60	0.40	0.44	0.01	0.02	0.01	0.01	0.01
Skilled labour	0.01	0.01	0.02	0.02	0.34	0.63	-0.10	0.16	0.01	0.02	0.01	0.02	0.02
Capital	0.01	0.01	0.02	0.01	0.16	0.41	-0.21	0.02	0.01	0.02	0.01	0.02	0.02

a) all prices are initialised at 1; b) Non-agricultural liberalisation is 100% for EU and 30% for India.

**Table A1.2 Change in sector output (% change with respect to base)**

	EU						India						Netherlands						
	initial		non-agricultural		non-ag. & agricultural		initial		non-agricultural		non-ag. & agricultural		initial		non-agricultural		non-ag. & agricultural		
	(min USD)		100	30	100	70	100	20	100	80	100	100	20	100	100	100	100	70	100
Cuts: EU			100	30	100	70	100	20	100	80	100	100	20	100	100	100	100	70	100
India			30	70	100	100	20	100	100	100	100	20	100	100	100	100	70	100	
Paddy rice	1706	0.40	0.25	0.40	-42.90	-30.74	12845	-0.13	-0.18	5.57	3.77	10	1.06	0.81	10	1.06	0.81	-76.32	-60.16
Wheat	26596	0.01	-0.04	0.03	0.03	0.01	20378	-0.14	-0.15	-0.30	-0.24	177	0.00	-0.02	177	0.00	-0.02	-0.14	-0.01
Cereal grains nec	30363	0.00	-0.02	-0.04	-0.04	-0.02	6138	-0.08	-0.12	-0.27	-0.20	113	-0.01	-0.03	113	-0.01	-0.03	-0.12	0.00
Vegetables, fruit, nuts	88339	0.00	-0.01	0.06	0.06	0.08	35455	-0.17	-0.20	-0.45	-0.40	3977	0.00	-0.02	3977	0.00	-0.02	0.01	-0.01
Oil seeds	12404	0.02	-0.03	0.10	0.10	0.26	25137	-0.25	-0.24	-0.57	-0.58	5	0.02	-0.04	5	0.02	-0.04	-0.07	0.16
Sugar cane, sugar beet	7772	0.00	-0.03	-2.04	-2.04	-0.83	10611	-0.09	-0.18	3.77	1.24	401	-0.01	-0.04	401	-0.01	-0.04	-2.13	-0.80
Plant-based fibres	2002	-0.08	-0.17	-0.09	-0.09	0.19	7963	3.70	3.89	2.04	2.96	0	-0.20	-0.24	0	-0.20	-0.24	-0.07	-0.21
Crops nec	82385	0.01	-0.02	0.05	0.05	0.06	22972	-0.27	-0.26	-0.60	-0.52	7534	0.02	-0.03	7534	0.02	-0.03	0.05	0.04
Cattle, sheep, goats, horses	46090	-0.01	-0.03	0.01	0.01	0.00	5819	0.04	0.03	1.60	0.97	1532	-0.03	-0.06	1532	-0.03	-0.06	-0.02	-0.05
Animal products nec	87306	-0.01	-0.02	0.01	0.01	0.00	14012	0.09	0.05	-0.20	-0.08	5410	-0.03	-0.06	5410	-0.03	-0.06	-0.07	-0.03
Raw milk	70701	0.00	-0.01	0.00	0.00	0.00	31619	-0.07	-0.18	-0.38	-0.25	5045	-0.03	-0.05	5045	-0.03	-0.05	-0.08	-0.06
Wool, silk-worm cocoons	1139	0.09	-0.11	0.91	0.91	4.76	3518	0.33	0.32	-0.49	-0.95	39	0.12	0.03	39	0.12	0.03	1.55	7.85
Meat: cattle, sheep, goats, horse	108212	-0.02	-0.04	0.02	0.02	0.00	924	-2.12	-1.76	-3.56	-2.65	3106	-0.03	-0.07	3106	-0.03	-0.07	0.01	-0.03

**Table A1.2 Change in sector output (% change with respect to base) (cont.)**

	EU						India				Netherlands				
	initial	non-agricultural		non-ag. & agricultural		initial	non-agricultural		non-ag. & agricultural		initial	non-agricultural		non-ag. & agricultural	
		0.01	-0.03	0.01	0.00		19	-1.30	-1.15	29.10		24.77	6528	-0.04	-0.07
Meat products nec	171414	-0.01	-0.03	0.01	0.00	19	-1.30	-1.15	29.10	24.77	6528	-0.04	-0.07	-0.08	-0.06
Vegetable oils and fats	81679	0.01	-0.03	0.02	0.44	8753	-1.34	-1.10	-2.99	-3.30	1717	-0.01	-0.04	-0.12	0.04
Dairy products	181263	-0.01	-0.02	0.00	0.00	6660	-0.08	-0.18	0.45	0.21	9525	-0.03	-0.05	-0.08	-0.06
Processed rice	6309	0.04	0.00	-17.36	-8.84	25621	-0.14	-0.21	3.37	1.45	99	0.01	-0.02	-7.96	-3.68
Sugar	42645	-0.01	-0.04	-2.91	-1.18	8318	-0.17	-0.26	11.90	4.17	976	-0.01	-0.04	-2.31	-0.87
Food products nec	466588	0.00	-0.03	-0.05	-0.02	13261	-0.51	-0.53	0.31	-0.02	25536	-0.01	-0.04	-0.11	0.06
Beverages and tobacco products	276468	0.00	-0.01	0.02	0.05	8026	0.06	-0.09	0.44	-0.09	12267	-0.01	-0.03	-0.05	-0.01
Natural resources extraction	189837	0.22	0.57	0.22	0.22	32733	-1.06	-1.72	-1.47	-1.21	7628	0.03	0.06	0.03	0.02
Textiles and leather	440589	-0.57	-0.61	-0.46	-0.54	61470	5.51	5.72	3.75	4.81	5728	-0.72	-0.76	-0.62	-0.70
Labour intensive manufactures	2298271	0.00	-0.01	0.02	0.01	71674	-0.48	-0.74	-0.91	-0.65	67266	0.01	0.04	0.01	0.00
Capital intensive manufactures	4154557	0.05	0.07	0.08	0.05	221544	-1.12	-0.89	-1.99	-1.45	166368	0.04	0.11	0.07	0.04
Services and activities NES	14385992	0.00	-0.01	0.00	0.00	528577	0.02	0.06	-0.03	-0.01	799447	0.00	-0.01	0.00	0.00



Table A1.3

## Imports of EU (% change with respect to base unless otherwise indicated) a)

	Imports from India			Imports from Rest of World			Share of India in total imports			
	initial	non-agricultural	non-ag. & agricultural	initial	non-agricultural	non-ag. & agricultural	initial	non-agricultural	non-ag. & agricultural	
	(mln USD)	100	100	(mln USD)	100	100	(mln USD)	100	100	
Cuts: EU		100	100	80	100	100	80	100	100	
India		30	70	20	100	20	100	30	70	
Paddy rice	109	-6	-5	561	433	192	2	1	-89	-79
Wheat	11	-7	-5	53	44	1505	0	0	-1	0
Cereal grains nec	4	-2	-2	51	40	1160	0	0	0	0
Vegetables, fruit, nuts	288	-3	-2	-3	-1	15024	0	0	0	0
Oil seeds	97	-3	-2	-9	-5	5540	0	0	0	0
Sugar cane, sugar beet	3	-4	-3	-24	-13	14	0	0	-1	0
Plant-based fibres	6	-11	-11	-15	-13	1194	0	0	0	0
Crops nec	363	-5	-3	-3	0	10775	0	0	0	0
Cattle, sheep, goats, horses	0	-2	-2	26	22	367	0	0	0	0
Animal products nec	48	-2	-2	6	6	2413	0	0	0	0
Raw milk	16	-6	-5	-17	-11	85	0	1	1	1
Wool, silk-worm cocoons	11	-11	-9	-26	-16	769	0	0	0	1
Meat: cattle,sheep,goats,horse	23	0	0	0	0	3427	0	0	0	0
Meat products nec	2	-2	-1	274	226	2275	0	0	0	0
Vegetable oils and fats	158	-5	-3	-1	1	7290	0	0	0	0
Dairy products	14	-6	-4	256	169	1295	0	0	0	0

**Table A1.3 Imports of EU (% change with respect to base unless otherwise indicated) (cont.)**

	Imports from India				Imports from Rest of World				Share of India in total imports					
	initial	non-agricultural	non-ag. & agricultural	initial	non-agricultural	non-ag. & agricultural	initial	non-agricultural	non-ag. & agricultural	initial	non-agricultural	non-ag. & agricultural		
Processed rice	39	-4	-3	2477	1199	-54	-33	450	0	0	8	8	83	63
Sugar	18	-4	-3	5847	2116	-15	-6	1707	0	0	1	1	1	43
Food products nec	657	-3	-2	23	19	0	0	25065	0	0	3	2	2	3
Beverages and tobacco products	12	-2	-1	49	37	0	0	6033	0	0	0	0	0	0
Natural resources extraction	587	8	17	7	8	1	1	122334	1	2	0	1	1	1
Textiles and leather	6732	55	57	49	53	-1	-1	105087	-2	-1	6	9	9	9
Labour intensive manufactures	2095	9	12	7	8	0	0	169971	0	0	1	1	1	1
Capital intensive manufactures	8174	1	5	-2	0	0	0	584652	0	0	1	1	1	1
Services and activities NES	10329	-3	-2	-5	-4	0	0	438973	0	0	2	2	2	2

a) Data are the combined results for EU26 and the Netherlands.



**Table A1.4 Imports of India (% change with respect to base unless otherwise indicated) (cont.)**

	Imports from EU			Imports from Rest of World			Share of EU in total imports								
	initial	non-agricultural		initial	non-agricultural		initial	non-agricultural							
		non-ag.	agricultural		non-ag.	agricultural		non-ag.	agricultural						
Vegetable oils and fats	13	2	1	83	2564	2095	2	1	4	-5	1	1	1	15	
Dairy products	30	3	2	10	19	13	3	2	6	-2	71	71	70	71	74
Processed rice	0	2	2	42	350	3	2	2	4	-14	11	11	11	14	39
Sugar	3	2	1	27	167	245	2	1	9	4	1	1	1	1	3
Food products nec	58	1	1	25	193	189	2	1	1	-18	23	23	23	28	52
Beverages and tobacco products	69	1	0	16	187	250	1	1	0	-14	22	22	22	24	48
Natural resources															
extraction	5427	34	91	33	33	14262	-11	-27	-11	-11	28	36	50	36	36
Textiles and leather	381	39	101	41	40	2460	2	-3	4	3	13	17	24	17	17
Labour intensive manufactures	2403	23	59	25	24	4893	-3	-12	-3	-3	33	39	47	39	39
Capital intensive manufactures	11213	27	72	28	27	40968	-4	-12	-3	-4	21	27	35	27	27
Services and activities NES	10266	1	1	2	2	9107	1	1	2	2	53	53	53	53	53

a) data are the combined results for EU26 and the Netherlands.

Table A1.5

## Exports of EU (% change with respect to base unless otherwise indicated) a)

	Exports to India				Exports to Rest of World				Share of India in total exports			
	initial	non-agricultural	non-ag. & agricultural	initial	non-agricultural	non-ag. & agricultural	initial	non-agricultural	non-ag. & agricultural	initial	non-agricultural	non-ag. & agricultural
Cuts: EU	(min USD)	100	100	80	(min USD)	100	100	80	(min USD)	100	100	80
India		30	70	20	100	30	70	20	100	30	70	20
Paddy rice	0	4	3	139	3141	13	0	23	14	0	0	0
Wheat	0	3	2	4	-22	1748	0	1	0	0	0	0
Cereal grains nec	0	1	1	3	-2	581	0	0	0	0	0	0
Vegetables, fruit, nuts	22	1	1	31	277	2943	0	0	0	1	1	3
Oil seeds	0	2	1	30	217	303	0	0	0	0	0	0
Sugar cane, sugar beet	0	2	1	17	8	8	0	1	1	0	0	0
Plant-based fibres	8	11	11	26	105	388	0	0	0	2	2	4
Crops nec	15	2	2	40	356	3264	0	1	0	0	0	2
Cattle, sheep, goats, horses	0	1	1	10	27	636	0	0	0	0	0	0
Animal products nec	28	1	1	5	11	2519	0	0	0	1	1	1
Raw milk	1	3	2	10	6	50	0	2	1	1	1	1
Wool, silk-worm cocoons	15	8	6	61	438	79	0	1	-4	16	17	23
Meat: cattle, sheep, goats, horse	6	1	0	16	13	1761	0	0	0	0	0	0
Meat products nec	6	1	0	30	141	5254	0	0	0	0	0	0
Vegetable oils and fats	13	2	1	83	2564	2974	0	1	0	0	0	1
Dairy products	30	3	2	10	19	10092	0	0	0	0	0	0

**Table A1.5 Exports of EU (% change with respect to base unless otherwise indicated) (cont.)**

	Exports to India				Exports to Rest of World				Share of India in total exports				
	initial	non-agricultural	non-ag. & agricultural	initial	non-agricultural	non-ag. & agricultural	initial	non-agricultural	non-ag. & agricultural	initial	non-agricultural	non-ag. & agricultural	
													initial
Processed rice	0	2	42	350	143	0	0	6	4	0	0	0	1
Sugar	3	2	27	167	1340	0	0	1	0	0	0	0	0
Food products nec	58	1	25	193	22855	0	0	0	0	0	0	0	1
Beverages and tobacco products	69	1	16	187	27890	0	0	0	0	0	0	0	1
Natural resources extraction	5427	34	91	33	12601	-3	-7	-2	-2	30	37	47	37
Textiles and leather	381	39	101	41	51053	0	0	0	0	1	1	1	1
Labour intensive manufactures	2403	23	59	24	258404	0	0	0	0	1	1	1	1
Capital intensive manufactures	11213	27	72	28	672296	0	0	0	0	2	2	3	2
Services and activities NES	10266	1	2	2	451253	0	0	0	0	2	2	2	2

a) data are the combined results for EU26 and the Netherlands.



**Table A1.6 Exports of India (% change with respect to base unless otherwise indicated) (cont.)**

	Exports to EU				Exports to Rest of World				Share of EU in total exports						
	initial	non-agricultural	non-ag. & agricultural	initial	non-agricultural	non-ag. & agricultural	initial	non-agricultural	non-ag. & agricultural	initial	non-agricultural	non-ag. & agricultural			
													initial	non-agricultural	non-ag. & agricultural
Vegetable oils and fats	158	-5	-3	-1	1	1348	-4	-3	-10	-7	10	10	10	11	11
Dairy products	14	-6	-4	256	169	82	-5	-4	-12	-9	15	15	15	15	33
Processed rice	39	-4	-3	2477	1199	1161	-3	-2	-8	-6	3	3	3	3	48
Sugar	18	-4	-3	5847	2116	43	-4	-3	-14	-8	30	30	30	30	97
Food products nec	656	-3	-2	23	19	1698	-3	-2	-6	-4	28	28	28	28	34
Beverages and tobacco products	12	-2	-1	49	37	98	-2	-1	-3	-2	11	11	11	11	16
Natural resources extraction	587	8	17	7	8	5366	1	7	0	1	10	11	11	10	10
Textiles and leather	6732	55	57	49	53	12209	-7	-6	-10	-8	36	48	48	48	48
Labour intensive manufactures	2095	9	12	7	8	4501	-3	0	-5	-3	32	34	34	34	34
Capital intensive manufactures	8174	1	5	-2	0	33447	-2	2	4	-3	20	20	20	20	20
Services and activities NES	10329	-3	-2	-5	4	8193	-3	-3	-5	4	56	56	56	56	56

Note: data are the combined results for EU26 and the Netherlands.



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