Economic benefits of the Doha round for The Netherlands

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SUMMARY

This study provides insights into the nature and magnitude of the impacts of the WTO Doha Round for international trade and the related welfare improvements. The methodology used is comparable with recent trade policy analyses of the World Bank, the IMF, the OECD, involving a similar quantitative modelling framework. The analysis of specific economic consequences for the Netherlands is a special feature of this study. These effects at the national level are considered in the context of overall effects at the EU and world level.

For a proper comparison of the situation before and after the Doha Round, it is necessary to account for the effects resulting from separate developments. Considerable attention was therefore given in the study to the development of a realistic "baseline". This baseline already takes into account events such as the entry of China into the WTO and the addition of new members to the EU. In this way it is possible to estimate those effects that are specifically attributable only to further trade liberalisation in the Doha Round.

No matter how complex, an economic model remains a necessary simplification of reality. Thus this model is heavily dominated by clearly quantifiable factors, such as reduced import tariffs. Non-quantitative trade restrictions, such as those facing the services sector, are usually not included in quantitative analyses. This carries the risk of underestimating the importance of these less visible trade restrictions. For this reason, this study attempts to quantify the effects of both liberalising trade in services and reducing administrative barriers facing exporters and importers at border-crossings.

A review of the international tariff situation reveals that the specific modalities of tariff reductions are at least as important as the actual amount reduced. Reduction

modalities that target peak tariffs result in a different tariff landscape compared to more simple reductions in average tariffs. Furthermore, developing countries have a particular interest in reducing tariffs that currently hamper South-South trade. This results from the fact that many developing countries have maintained a high level of protection under the Uruguay Round.

The increase in global income from trade liberalization is estimated at between $210 billion for partial liberalization to $670 billion for a full liberalization scenario.[1] The analysis underlines the importance of trade policy reform by developing countries for achieving these benefits. About one quarter of the global gains can only be realized if developing countries actively participate. At the same time, developing countries can achieve high gains relative to their current income levels.

A third of the estimated benefit of $210 to $670 billion is attributable to trade facilitation, a third to agricultural liberalization and the remaining third approximately equally to both reductions in industrial tariffs and liberalization in services. Leaving aside trade facilitation and services liberalization, industrialized countries have the most interest in seeing agricultural liberalization in other OECD economies as well as a reduction in industrial tariffs by developing countries. For developing countries, the benefits arise primarily from trade liberalization with other developing countries, especially in manufactured goods.

The results for the agricultural sector are mixed: net benefits at a global level, with particularly the EU, Africa and the majority of Asia profiting, but potentially negative effects in the long-term for the Asia-Pacific region and North America. This is a striking results that seems at odds with the current positions taken in the

[1] This compares to recent study from the IMF and the World Bank, which forecasts a welfare increase of $280 billion in the middle term and $650 billion in the long term.

agricultural negotiations. However, the results highlight the importance of taking a long-term structural view, including effects beyond agriculture. CAIRNS group countries should perhaps be cautious about expecting long-term economy-wide gains if, as a result of liberalization, the agricultural sector draws more resources away from other productive uses. Developing countries also need to think carefully about the risks of reinforcing an emphasis on primary exports with consequent de-industrialization.

The potential increase in world income from reducing agricultural import tariffs could reach $60 billion, but 60 percent of this is dependent on effective dismantling of market protection in developing countries. Additional reduction of internal agricultural support results in an economy-wide increase in income that is greater for the EU than for North America. Within Europe this is more relevant for France, Germany and Eastern Europe than for the Netherlands. Dutch agriculture, with its own particular specialisations, is less dependent on European production support than the typical agricultural sectors of other countries.

The worldwide results are consistently positive for the industrial sector, with regards to both short- and long-run effects. The benefits of reducing industrial tariffs, estimated at about $35 billion with partial liberalisation, and $55 billion with full liberalisation, are (especially in the long term) greater than those for the agricultural sector due to the relatively larger investment spending released in the industrial sector.

The readiness of developing countries to reduce effectively their own tariffs is crucial to realizing prospective worldwide benefits in this area. While many developing countries engaged in significant liberalization in the 1980s and 1990s, many of these countries still maintain tariffs at relatively high (albeit reduced) levels. The wide gap between bound and applied tariff rates limits the bargaining power of

developing countries and means that the debate as to which tariffs (bound, applied, or historic) to use as the reference point in market access negotiations is particularly important. A noteworthy exception in the general pattern of results is China, which is found to meet stiffer competition from other developing countries, with its export prices under consequently pressure. These results highlight the critical role that determination of market access modalities (including benchmark or base negotiating rates) will play in securing benefits for developing countries.

Impacts on the Netherlands

The Netherlands, being a very trade-oriented economy, could enjoy a disproportionate share of world welfare gains. With further liberalization, national income would be about 2 percent higher over the long term. An important part of the Dutch economy, including the transport and food processing sectors, benefits from greater trade flows. Relevant tariffs facing Dutch exporters are on average higher than the protection granted to them on EU markets. Breaking down tariff barriers provides these exporters with relatively large export opportunities.

Dutch output would expand particularly in the food processing and the transport and logistics sectors. The higher than average growth in exports in transport services reflects the general dependence of the Dutch economy on the size of international trade flows. On the other hand, the Dutch manufacturing sectors, in particular the metal and electrotechnical industry, will face stiff competition from Asia. Asian producers can benefit from a growing domestic market and also from growing export market that enables them to achieve more cost-effective scales of production.

A noteworthy result is that the study does not point to any general vulnerability of the Dutch agricultural sector to trade liberalization within the WTO. Sectors that are heavily dependent on European agricultural subsidies, such as grain and beef production, do not occupy a major share of the Dutch agri-food sector. In some other agricultural sectors, such as dairy (certainly with the lifting of production quotas), there is even room for expansion. Reform of the European sugar regime will almost certainly lead to diminished production in the Netherlands but sugar remains a possibility for crop diversification if grains become less attractive due to falling prices. The results confirm the comparative advantage of the Netherlands in agriculture, food processing and transport and the large dependence of the Dutch economy on international trade.

Despite the dominance of services in the Dutch GDP (accounting for about three quarters of GDP), the preliminary estimates indicate that liberalization would have a relatively limited impact on this sector, certainly in comparison to a region such as North America. The projected export growth rates in services are positive, and their contribution to the trade balance rises. However, the predominantly national orientation, combined with a low share of international trade, yields only a minor impact on domestic production.

In this regard, it should be noted that the analysis is restricted to the cross-border trade effects of liberalization in services while potentially considerable benefits from Dutch foreign investment are not incorporated fully.

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1 Introduction

After the failed attempt in Seattle in late 1999, the Ministerial Meeting of the World Trade Organization (WTO) in Doha, in November 2001 launched the agenda for a new comprehensive round of multilateral trade negotiations. The ministerial declaration emphasizes that his new round provides a major opportunity for developing countries. Consequently the agenda for new WTO round has been coined the 'Doha Development Agenda'.

This study provides insights in the economic effects of the new WTO Doha round for the Netherlands. It places the analysis for the Netherlands against the background of worldwide effects and effects for the European Union.

The study provides insights into the nature and magnitude of the impacts of the WTO Doha Round for international trade and the resulting welfare improvements. The methodology used is comparable with recent trade policy analyses of the World Bank, the IMF, and the OECD, involving a similar quantitative modelling framework. The analysis of specific economic consequences for the Netherlands is a special feature of this study. These effects at national level are considered in the context of overall effects at EU and world levels. The study covers the areas of agricultural liberalization, liberalization in industrial tariffs and liberalization in services trade.

No matter how complex, an economic model remains a necessary simplification of reality. Thus this model is heavily dominated by clearly quantifiable factors, such as reduced import tariffs and reduced export subsidies. Non-quantitative trade restrictions, such as those facing the services sector, are usually not included in quantitative analyses. This carries the risk of underestimating the importance of these

less visible trade restrictions. For this reason, this study attempts to quantify the effects of both liberalizing trade in services and reducing administrative barriers facing exporters and importers at border-crossings.

This study was prepared at the request of the Dutch Ministry of Economic Affairs, directorate foreign economic relations. The authors benefited greatly from the discussions with the advisory committee, which consisted of:

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Dr. Arjan Lejour, senior researcher international affairs, CPB Netherlands Bureau for Economic Analysis

Prof. Dr. Gerrit Meester, senior policy advisor international affairs, Ministry of Agriculture Nature Management and Fisheries

The report is organized as follows: Chapter two provides a background on the importance of trade for the Dutch economy. A picture of the global policy landscape follows in chapter three. This chapter also develops the liberalization scenarios for the subsequent quantitative analysis. Chapter four describes briefly the modeling framework used. Chapter five discusses the results of our liberalization scenarios. It starts with a section on global results, proceeding with the results for the EU and finally discussing the estimated impact on the Netherlands.

2 Dutch foreign trade

2.1 Composition of trade

The Dutch economy is open to foreign trade. Like many small countries its ratio of trade to GDP is high. Because of greater variety in goods produced domestically, big countries with a large domestic market, in general, can exploit scale economies and they can exploit a wider range of available resources. Smaller countries rely on trade to enable them to benefit from their comparative advantage. In The Netherlands, the value of imports represents 56% of GDP, which stands in stark contrast to its large neighbour Germany, where this indicator is just 26% (Table 3.1). The Netherlands is also a net exporting country, with exports representing 62% of GDP. The high import and export ratio highlights also the 'mainport ' feature of The Netherlands, which serves as a distribution centre for the populous European hinterland. This important part of the Ducth economy can be expected to benefit from an expansion of global trade volumes in the wake of further trade liberalisation.

Table 2-1: Trade openness

	Exports/ GDP (%)	Imports/ GDP (%)
Netherlands	62	56
France	26	23
Germany	27	26
Rest EU15	32	32
Rest OECD	16	16
Developing countries	25	27
Rest of World	30	30

Source: GTAP v5 database. Calculations LEI

It is essential for small economies to specialise in the production of a relatively narrow product range in order to import a large variety of foreign goods. The Netherlands is traditionally specialised in exports of products in the petro-chemical complex and the agri-food complex. The production factors 'sea location' and 'soil and climate' have in the past stimulated the growth of the transport sector, agriculture and food processing. The growth of the petrochemical complex has also been stimulated by the sea location which provided good access to raw materials, but this can only be a partial explanation of their success. Those capital-intensive processing industries depend also on the exploitation of economies of scale and the availability of skilled labour. With a small domestic market, economies of scale can only be realised if the market is expanded and a significant portion of production is exported.

Scale economies play also a dominant role in the development of basic metal industries and aluminium industries. In contrast, industries such as electrotechnical and small scale manufacturing sectors are more dependent on technological progress and a diversified and highly skilled labour base. Although these sectors are not very capital intensive in production, they often require substantial R&D investments to develop new and diversified product niches. These sunk costs can only be recuperated if the product market is large enough.

A partial picture of Dutch foreign trade is provided in Figure 2-1. With the exception of some agricultural exports, especially cut flowers, tomatoes and pork products, which have a large contribution to the countries' net exports, most products that rank high on the exports also register high import values. For agricultural primary products the explanation can be found in the specialisation pattern following traditional arguments. Location specific factors, combined with external scale economies that can be realized horticultural clusters have spurred the growth of

horticultural products, such as greenhouse vegetables and cut flowers. Likewise, intensive livestock farming does not depend on the scarce production factor land, and has benefited from the cheap availability of imported feedstuff (e.g. tapioca and soya meals).

The simultaneous occurrence of large export and import figures outside primary agriculture can be attributed to two factors, both of which are partial explanations. First, at the level of aggregation used here, we will observe some intra-industry trade. With product differentiation and firm specific scale economies the production of each variety of the same product tends to be concentrated in one particular country. If consumers have acquired a taste for variety, the whole range of varieties will be in demand, and each country simultaneously imports and exports some part of the variety spectrum. (Helpman and Krugman, 1989).

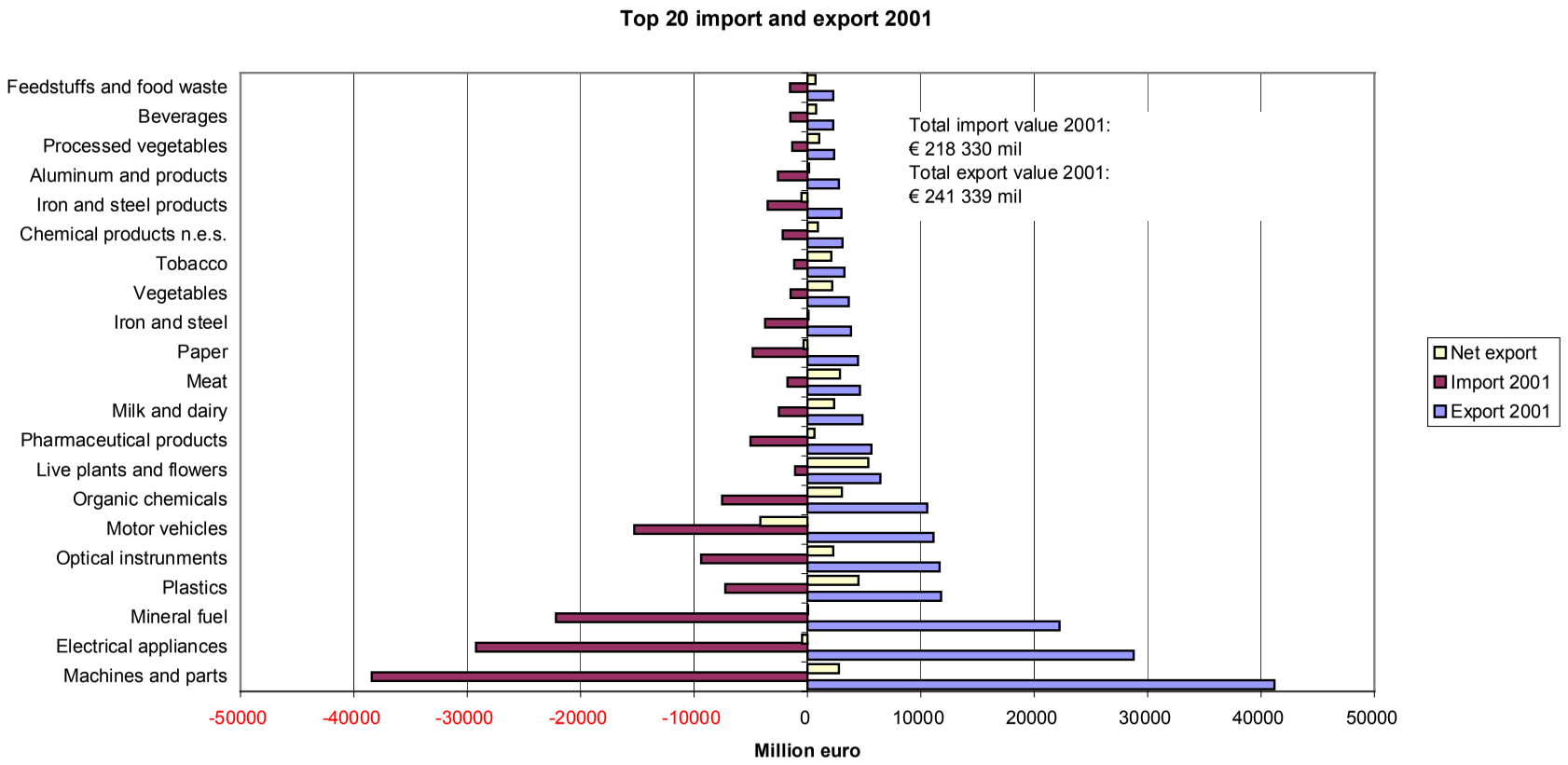


Figure 2-1: Top 20 imports and exports

Second, an important issue for The Netherlands is re-exports, as recently highlighted by the Central Planning Bureau. According to CPB (2001, 2002b), re-exports[2] have soared in the 1990s to account for an impressive 40% of total Dutch exports in 2000. In 1990 the estimated share of re-exports was just 20%. The feature of the Dutch economy as an 'entrepot economy' is realized by international distribution centres which distribute goods from America and Asia to the Northern European hinterland.

This function of The Netherlands as a logistics and distribution centre points towards potential gains from worldwide trade liberalisation. The Dutch transport and logistics sector can benefit from an expansion of global trade volumes, which can be the result of further trade liberalisation.

The European hinterland dominates the structure of Dutch exports. More than 75% of exports find their way to European destinations, as highlighted in Table 2-2. While the regional structure of exports has been quite stable over time, the structure of imports has changed notably during the 1990s. An increasing share of imports is sourced from the Far East, where especially, the P.R. China, Taiwan and South Korea have witnessed impressive growth rates (from € 14 billion in 1996 to € 41 billion in 2001). Imports from developing countries have also risen during the 1990s.

The portion of Dutch exports destined for European markets is even larger for those products that are re-exported to a large extent. A good example is 'office equipment and computers', which account for one quarter of total re-exports, but hardly register domestically produced exports. Another example is tropical fruit

[2] Re-exports are traded goods that are transported through the Netherlands without further significant industrial processing. In order to be accounted as re-exports, the ownership of goods has to be transferred to a Dutch resident. Without such transfer of ownership, the good would be classified as transit good, which is not included in the National Accounts. For further discussion of technical matters, please refer to CPB (2001).

juices, which are imported in large quantities through Rotterdam harbour, but the bulk of it is again exported to European destinations. Re-exports occur mainly in those products where the Netherlands does not have an obvious comparative advantage.

Table 2-2: Source and destination of trade in goods

	Regional structure of Dutch exports (%)			
	1996	1998	2000	2001
Total	100	100	100	100
European Union	77	76	75	77
USA	3	4	4	4
Far East (Japan, S.E. Asia, Taiwan)	5	4	5	4
Rest of World	14	16	16	15
	Regional structure of Dutch imports (%)			
	1996	1998	2000	2001
Total	100	100	100	100
European Union	63	60	54	54
USA	8	9	9	9
Far East (Japan, S.E. Asia, Taiwan)	13	16	18	19
Rest of World	16	15	17	18

Source: CBS, International Trade Statistics 2001, calculations LEI.

Table 2-3: Structure of commodity exports by product group, 2000 (%)

%	Domestically produced goods	Re-exports	Total exports
Agriculture and food	27	6	19
Chemicals	23	14	19
Machinery, electronic equipment and transport equipment	27	65	43
of which: office equipment and computers	1	25	11
Other goods	23	15	19
Total	100	100	100

Source: CPB (2001), calculations LEI.

2.2 Revealed comparative advantage

Identifying those products that perform well in the international competition can give some indication as to which products and sectors might gain from a multilateral lowering of trade barriers. On the other hand, identifying products in which The Netherlands does not have a comparative advantage will help to flag tougher international competition in the face of lowering import protection.

One measure that helps to identify the competitive strength of a country is the so-called 'Revealed Comparative Advantage Index" (RCA) (Balassa, 1965). This index shows if an exported commodity performs above the average Dutch export product in terms of world market shares. If the product has a large world market share -adjusted for the total participation if Dutch exports in world trade- than the product is said to reveal a comparative advantage.[3]

The RCA index can be criticized in various grounds. For example, it does not take product differentiation and intra-industry trade into account. Another disadvantage of this indicator in the Dutch context is that it only takes exports into consideration and does not account for import penetration. The fact that a substantial portion of Dutch exports is re-exports should be taken into account in this type of analysis. By supplementing the RCA with the ratio of exports to imports gives a better picture of the strengths and weaknesses, but is obviously still incomplete. If the RCA is high, but the ratio of exports to imports low, it is an indication that this product is mainly re-exported or product differentiation features are significant. Nevertheless the RCA supplemented with the export/import ratio can provide a useful guideline to assess export performance. A schematic presentation is provided in Figure 2-2.

[3] The RCA for good *i* from the Netherlands is defined as: [(export good i, NL)/(world exports good i)]/ [total exports NL)/ (world exports)] * 100

displays a grouping of commodities according to their RCAs and export values. The data represent averages for the period 1993 and use the full list of 261 products from the UNCTAD trade statistics. The commodties shown represent 80% of the total export value in each quadrant of the table, and provide a very complete picture.

The picture emerging from this 'roadmap' confirms the observations made earlier. Products with a revealed comparative advantage and whose exports are mostly domestically produced (the North-East corner of the table) are predominantly in certain agricultural products, food processing and in petro-chemicals. The analysis also reconfirms for the more recent period of observation the findings by van Hulst and Soete (1989) who carried out a similar exercise at a more aggregate level and at during the mid-1980s. Ottens (2001) has conducted a similar study but at a more aggregate level and covering data up to 1996.

Figure 2-2: Schematic classification of traded products

	Export/import <1	Export/import >1
RCA > 100	**Revealed comparative advantage, but exports dependent on imports. Little added value and/or large re-exports**	**Revealed comparative advantage and mainly indigenous products**
RCA < 100	**Revealed comparative disadvantage. Net import product**	**Revealed comparative disadvantage and mainly indigenous products**

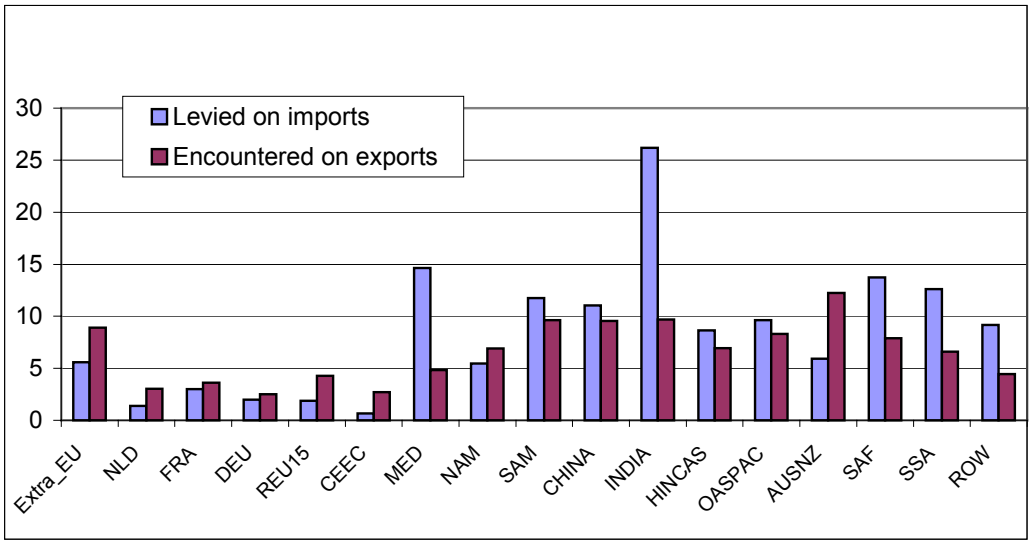
Table 2-4: Revealed comparative advantage roadmap

	Export/import < 1					Export/import ≥ 1				
RCA ≥100	SITC	Commodity	Avg RCA	Avg ratio exp/ imp	Avg exp mln $	SITC	Commodity	Avg RCA	Avg ratio exp/ imp	Avg exp mln $
	752	Automatc.data proc.equip	212	0.97	10424	334	Petroleum products	331	3.15	8218
	759	Parts,for office machins	139	0.85	4720	292	Crude veg.materials, nes	957	5.00	4655
	542	Medicaments	120	0.96	2279	343	Natural gas	332	8.18	3662
	641	Paper and paperboard	100	0.89	2220	054	Vegetables	453	2.50	3031
	022	Milk and cream	284	0.91	1388	012	Other meat, meat offal	345	5.58	2653
	893	Articles,nes,of plastics	101	0.86	1355	122	Tobacco, manufactured	462	6.06	2615
						575	Oth.plastic,primary form	209	1.92	2068
						511	Hydrocarbons,nes,derivts	322	2.07	1995
						081	Animal feed stuff	264	1.48	1940
						024	Cheese and curd	506	5.82	1916
						898	Musical instruments,etc.	170	1.49	1766
						574	Polyacetal,polycarbonate	349	3.31	1728
						684	Aluminium	116	1.09	1550
						598	Misc.chemical prodts.nes	144	1.36	1505
						011	Bovine meat	280	3.38	1423
						783	Road motor vehicles nes	253	5.05	1401
						582	Plastic plate,sheets,etc	145	1.24	1374
						751	Office machines	286	1.37	1370
						098	Edible prod.preprtns,nes	235	2.95	1367
						056	Vegtables,prpd,prsvd,nes	394	3.70	1356
						112	Alcoholic beverages	128	1.54	1236
						541	Medicines,etc.exc.grp542	119	1.08	1149
						571	Polymers of ethylene	228	3.37	1139
						533	Pigments, paints, etc.	163	1.80	1132
						774	Electro-medcl,xray equip	248	2.19	1111
						673	Flat-rolled iron etc.	112	1.48	1047
						872	Medical instruments nes	136	1.16	1024
						744	Mechanical handlng equip	102	1.28	971
						881	Photograph appar.etc.nes	222	2.88	969
						882	Photo.cinematogrph.suppl	158	1.44	937
						516	Other organic chemicals	239	1.39	909
						513	Carboxylic acids,derivts	174	1.03	891
RCA < 100	SITC	Commodity	Avg RCA	Avg ratio exp/ imp	Avg exp mln $	SITC	Commodity	Avg RCA	Avg ratio exp/ imp	Avg exp mln $
	781	Pass.motor vehcls.ex.bus	34	0.46	3113	776	Transistors,valves,etc.	86	1.43	5375
	764	Telecomm.equip.parts nes	54	0.85	2546	931	Spec.transact.not classd	84	10.43	3270
	784	Parts,tractors,motor veh	32	0.55	1377	778	Electric.mach.appart.nes	78	1.01	2036
	772	Elec.switch.relay.circut	55	0.96	1281	874	Measure,control instrmnt	84	1.00	1647
	845	Othr.textile apparel,nes	71	0.63	1112	728	Oth.mach,pts,spcl indust	61	1.48	1223
	792	Aircraft,assoctd.equipnt	38	0.81	1079	515	Organo-inorganic compnds	88	1.15	988
	782	Goods,spcl transport veh	60	0.77	1057	892	Printed matter	94	1.18	826
	699	Manufacts.base metal,nes	70	0.86	980	741	Heatng,coolng equip,part	60	1.11	777
	894	Baby carriage,toys,games	90	0.70	909					
	714	Engines,motors non-elect	73	0.84	860					
	821	Furniture,cushions,etc.	53	0.50	842					
	775	Dom.elec,non-elec.equipt	72	0.59	759					
	625	Rubber tyres,tubes,etc.	89	0.75	713					
	841	Mens,boys clothng,x-knit	53	0.53	626					
	743	Pumps nes,centrifugs etc	52	0.90	619					
	842	Women,girl clothng,xknit	51	0.50	601					
	851	Footwear	46	0.54	598					
	723	Civil engineering equipt	54	0.89	572					
	713	Intrnl combus pstn engin	27	0.58	559					
	651	Textile yarn	52	0.62	515					
	679	Tubes,pipes,etc.iron,stl	62	0.71	490					
	773	Electr distribt.eqpt nes	45	0.85	482					
	762	Radio-broadcast receiver	88	0.76	481					
	844	Women,girls clothng.knit	84	0.67	453					
	747	Taps,cocks,valves,etc.	58	0.75	402					
	553	Perfumery,cosmetics,etc.	59	0.66	398					
	761	Television receivers etc	50	0.44	393					
	675	Flat-rolled, alloy steel	64	0.59	377					
	763	Sound recorder,phonogrph	53	0.57	376					
	664	Glass	79	0.90	373					
	663	Mineral manufactures,nes	85	0.94	370					
	742	Pumps for liquids,parts	57	0.92	350					

2.3 Import protection and export barriers

The trade openness of the Netherlands seems to be underscored by low (trade weighted) average applied import tariffs in Figure 2-3. However, this is also due to the large share of intra-EU trade, which is duty free. On average, the level of protection that Dutch firms encounter on their export markets is higher than the barriers imposed on imports into the Netherlands. Broadly speaking, this points to a potential Dutch interest in improved market access. The global protection landscape is more elaborately described in chapter two

Figure 2-3: Applied trade protection



Source: GTAP v5 database, calculations LEI.

2.4 Services

Trade in services has received a growing attention in recent years, and stands firmly on the Doha agenda. Structural changes in developed market economies naturally lead to an increasing share of services in GDP. In OECD countries, services typically represent 60-70% of GDP (OECD, 2001), and in The Netherlands this percentage is even as high as 75% (including publicly provided services, such as education and

health care). Even in the lowest income countries, services account for more than a third of GDP. Economists have observed that the demand for services is relatively highly income elastic, and productivity growth lags behind productivity growth in agriculture and manufacturing (Baumol et al. 1989). As incomes grow, and people become richer their demand for services expands more rapidly than their demand for food products and manufacturing goods. Although services represent an increasing share in the economy and in international trade, services sectors operate predominantly at the national level, and are typically less traded internationally.

Within the General Agreement of Trade in Services (GATS), WTO members have made agreements to liberalize trade in services. The main aspect of these agreements is that countries promise to grant national treatment to foreign service providers in certain sectors. An important aspect of trade in services is the fact that it is broader than trans-boundary supply, as in the case of trade in goods. In the services sectors, one speaks of international trade if the supplier (or buyer) crosses the border. A case in point is international tourism, where the consumer of the service typically crosses the border to enjoy the service in another country. But also direct foreign investment (FDI) is often involved, in which case the supplier of service crosses the border. The GATS distinguishes four modes of supply.[4] The European Commission (2002) provides a concise summary of the state of play in the services negotiations. Information on trade protection in services is even less readily available from statistical sources than protection information for agriculture and manufactures. In our subsequent modeling exercise we provide estimates trade protection in services trade and estimates of the effects of reducing these barriers.

[4] Mode 1: cross border supply (e.g. banking services supplied via e-mail); Mode 2: consumption abroad (e.g. tourism); Mode 3: commercial presence (e.g. foreign branch of a bank); Mode 4: presence of natural persons (e.g. non-national employees of foreign bank branch)

The thin borderline between trade and foreign investment in the case of services also hampers statistical analysis of trade in services. Only recently has the Dutch Statistical office (CBS) started a joint initiative with the Dutch Central Bank (DNB) to provide improved estimates of trade in services. These new estimates reveal that the international distribution function of the the Netherlands is gaining weight in the economy. Between 1995-1999 the export of services has risen faster that exports of goods. Exports of services has risen 48% while exports of goods has increased by 23%. (CBS, 2002). Transport services have contributed the largest share to the rising services exports.

However, despite impressive growth rates, services are still less traded internationally than goods. Estimates in Table 2-5 show that the ratio of services exports to output equals about 11% in 1999, while the economy-wide average is about 20%. Within services, transport services take the lead with a share of more than 40% of the export value. This is followed by business services, such as insurance, financial services and computer- and ICT services. Also included in this category are royalty and license fee receipts. In total services represent about one fifth of trade values.

The geographical composition of trade in services is comparable to the composition of trade in goods, but compared to goods closer trade links exist with the USA. According to data from DNB, the USA absorbs 15% of total services exports from The Netherlands and it supplies 16% of services imports. As in goods trade, the largest share goes to other European countries, with Germany being the most important trading partner, followed by France.

Table 2-5: Dutch services trade

	1996	1997	1998	1999	(as % of output value 1999)(*)
	Services exports				
Transport&Trade	16724	19920	20320	21340	19%
Business	13479	16672	17205	20097	13%
Other private and public	6967	7942	8929	9007	4%
Total exports	37170	44534	46454	50444	11%
(as % of total goods & services exports)	20%	21%	21%	22%	
	Services imports				
Transport&Trade	11976	13827	15322	15855	14%
Business	13003	16104	15279	19089	12%
Other private and public	10141	10850	12552	11640	6%
Total imports	35121	40781	43152	46583	10%

Source: DNB, note: (*) output value calculated from Input Output table 1999

Table 2-6: Geographical composition of services trade 1999

	Exports (% of total)	Imports (% of total)
World	100	100
EU15	58	59
Germany	17	14
UK	14	16
France	5	7
CEECs	2	2
USA	15	16
Asia	11	8
South America	1	1

Source: DNB, calculations LEI

3 Trade Liberalization Scenarios

The core of our analysis is structured around a set of scenarios. These scenarios are based on alternative liberalization approaches for agriculture, manufactured goods, and services trade. They are meant to illustrate the implications of alternative approaches to market access liberalization. They are stylized rather than exact representations. In part, this is because we are working with an aggregate model (i.e. we do not model trade at the 6-digit HS level), and as such detailed treatment of all product-specific proposals is simply impossible. In addition, the actual market access modalities remain to be worked out. In agriculture, domestic support may or may not be affected, developing countries may or may not have to liberalize, and certain politically sensitive sectors may yet again escape from meaningful liberalization. Our scenarios are themselves decomposed into different components, related to specific sets of countries and specific sectors and instruments. This offers the advantage of allowing us (or the reader) to construct rough representations of hybrid liberalization experiments later, since individual components can be taken from different scenarios and combined.[5]

3.1 The Policy Landscape

Tariff negotiations in the GATT/WTO have generally been based on tariff bindings, or schedules of concessions tabled under GATT rules, and the coverage and level of these bindings is an important element of the initial conditions for the negotiations. Table 3-1 provides information on the share of industrial-product tariffs (on a trade-

[5] Technically, decomposition of general equilibrium-related effects of policy scenarios exhibits path dependence, meaning that the decomposition can be sensitive to the ordering of the elements of the experiment set. The impact of a particular instrument is also sensitive to the other members of the set. We employ a linear decomposition method here that does not exhibit path dependence (Harrison et al 2000). As such, individual experiment elements are roughly additive.

weighted basis) that remains either unbound or bound above applied rates. While tariffs in the OECD (and Latin America) are generally bound, many Asian and African economy tariffs remain unbound despite more than a four-fold increase in the coverage of developing-country tariff bindings in the Uruguay Round (Abreu 1996). For almost all developing countries, existing bindings are, on average, well above applied rates, reflecting a combination of relatively high initial bindings, and the subsequent wave of reductions in applied rates. (See Blackhurst *et al* 1996, Francois 2001).

In addition to general Uruguay Round commitments, there have also been efforts for sector-based commitments to implement zero tariffs (called "zero-for-zero"). This is reflected in the next-to-last column of Table 3-1. As a result of zero-for-zero efforts, OECD economies have between roughly 10% and 30% of tariff lines bound at zero percent. Most developing countries have opted out of this process. Zero-for-zero increased developed country duty-free imports to 43% of total imports (Laird 1998). The process itself ground to a halt after the initial Information Technology Agreement (ITA). This seems to have been for two reasons: (i) the sectors in which OECD economies could easily reach agreement had already been included, and (ii) those sectors remaining involve North-South issues not susceptible to this approach. In other words, the cherries have been picked, leaving us with the hard nuts.

With the implementation of Uruguay Round commitments, average *ad valorem* tariffs in the industrial countries generally are around 3 percent. This is reflected in the first columns of Table 3-2. However, there are important exceptions. One of these is textiles and clothing, where the average rate is roughly three times this average. This is reflected in the standard deviation and maximum tariff columns.

With full implementation of current commitments, we estimate a simple average industrial tariff in the United States of 3.2 percent, a standard deviation of 4.3, and a maximum tariff of 37.5 percent. The European Union has a higher average, but less dispersion. (The EU has an average of 3.7 percent, a standard deviation of 3.6 percent, and a maximum tariff of 17 percent. For the developing countries in Table 3-1, average industrial tariffs range from a low of 3 to 4 percent to a high of more than 20 percent. Table 3-2 presents detailed data for three developing countries: Brazil, India, and Thailand. These countries span the spectrum of developing country bindings as reflected in Table 3-1. Brazil's tariffs are all bound, though the average rate for industrial products is 14.9 percentage points above the current applied rate. This gap is called a "*binding overhang*." India and Thailand's tariffs are partially covered by bindings, again with significant binding overhang. In general, for developing countries, binding overhang is large enough that reductions in the range of 50% are necessary to force reductions in average applied rates for countries like Brazil. For many countries, even this will have little for no effect, as tariffs are largely unbound. For example, note that one-third of India's manufacturing tariffs and 90 percent of Sri Lanka's tariffs are unbound. Of course, this limits severely the negotiating leverage of developing countries in the WTO. This is also why the debate of using bound, applied, or "historic" rates as a starting point is important.

As in the case of industrial tariffs, the stage for any future agriculture negotiations was also set by the Uruguay Round outcome-- this time by the Uruguay Round Agreement on Agriculture (URAA). One key difference from industrial products is that essentially all agricultural tariffs are bound. However, in both industrial and developing countries, there is a large degree of binding overhang resulting from "dirty tariffication" or the use of "ceiling bindings" (Hathaway and

Ingco 1996). The next round of agricultural negotiations was scheduled in the URAA, while the negotiating parameters (tariffs, tariff-rate-quota levels, subsidy commitments, etc.) must also be viewed in the context of the schedules of URAA commitments. The system that has emerged is complex and similar to arrangements in the textile and clothing sectors, featuring a mix of bilaterally allocated tariff-rate-quotas (with associated quota rents) and tariffs. Viewed in conjunction with industrial protection, the basic pattern is that the industrial countries protect agriculture and processed food, while protection in developing countries is more balanced (though also higher overall) in its focus on food and non-food manufactured goods.

The URAA had a stated goal of no backsliding and modest liberalization. However, negotiating parties (generally the relevant agriculture ministries) gave considerable leeway to themselves with regard to selection of the appropriate reference period from which to measure export subsidy reductions. In addition, the move to a price-based system for protection has, in many cases, been subsumed into an effective adoption of explicit quotas. The disciplines on domestic subsidies have also been weakened by a relatively soft definition of the AMS vis-à-vis individual subsidies and the scope for reallocation of expenditures within the AMS. (See Tangermann 1998 for discussion.) Commitments not to erode current market access were meant to limit the scope for increased protection through dirty tariffication. As the name implies, dirty tariffication involved violations of the spirit, if not the letter, of the URAA text. It involved setting tariff bindings at rates far above then current effective protection rates. The practice of setting high bindings complicated the problem of measuring the impact of further commitments to reduce bindings. Basically, in agriculture, we are in a world that allows scope for great policy discretion and uncertainty as a result of the loose nature of the commitments made. In addition, the setting of high bound rates made

possible the conversion of NTBs into even more restrictive import tariffs. This in turn made quantity disciplines necessary to avoid backsliding. Despite the goals of subsidy reductions and a shift toward price-based border measures, one of the more striking features of the regime that has actually emerged is the prominent role that quantity measures have taken in the new architecture. Basically, the agricultural trading system is complicated and still evolving. Policy measurement in this area has converged on the use of price-based measurements that emphasize the tax/subsidy equivalent of policy. (As this approach reflects available data, this is the approach we employ in this study as well.)

For services, “market access” is a problematic concept. From the outset, service negotiations have been "qualitative." They have not targeted numeric measures, but rather commitments in the cross-border movement of consumers and providers and the establishment of foreign providers. In fact, the GATS actually confuses FDI with international trade. As a result, efforts to quantify market access in service sectors (a basic requirement if we want to then quantify liberalization) have been problematic at best. The standard approach (an example is Hoekman 1995) has been to produce inventory measures.

As an alternative perspective, we follow Francois (2001) and have produced estimates of "tariff equivalents" for services trade. These are based on a simple simple gravity model, estimated from detailed global trade data for services trade in 1997. The basic approach is described in the annex to this report. The resulting estimates are summarized in Table 3-3. The estimates are admittedly crude. The pattern that emerges is consistent with that for industrial tariffs. It appears that barriers to services trade are higher (often much higher) in developing countries than in the OECD. Hence, as in the case of industrial tariffs, the effects of further GATS

negotiations will hinge critically on developing country participation or non-participation, and the extent to which they commit to actual liberalization rather than stand-stills (the qualitative equivalent of ceiling bindings).

3.2 Trading costs

With the reduction in traditional trade barriers, attention in the regional and multilateral trade arenas has not only shifted to quantity restrictions, but also to trade facilitation measures. These are meant to target less transparent trade barriers, such as customs procedures, product standards and conformance certifications, licensing requirements, and related administrative sources of trading costs. Studies of regional integration initiatives (Baldwin and Francois 1997, Smith and Venables 1988) have emphasized the potential for liberalization initiatives to substantially reduce such barriers. Conceptually, these costs are different from the price and quantity measures used for manufactures and agriculture. They are a pure global deadweight loss.

The estimates of trading costs are very rough (at best). Nonetheless, they provide some sense of the magnitudes involved. An overview of estimates is provided in Table 3-4. In the context of the EC single market program, elimination of internal customs procedures and related administrative streamlining were projected to reduced trading costs by up to 2 percent of the value of trade (EC 1988). Globally, UNCTAD (1994) has noted that trading costs represent 7 to 10 percent of the cost of delivered goods. Like the EC, UNCTAD also estimates that simple trade facilitation measures could reduce these costs by 2 percent of the value of trade. The Australian Industry Commission (1995) has estimated potentially higher savings in the context of APEC, ranging from 5 to 10 percent of the value of trade. Under more modest facilitation initiatives, the Japanese Economic Planning Agency (1997) has estimated

savings at 2 percent in an APEC context, while Francois (2001) has employed a similar range of estimates.

3.3 Policy scenarios

To bring these elements together, we define three sets of scenarios (See, Table 3-5). The first two are partial liberalization scenarios. In the "Linear 50%" all trade instruments are reduced by 50%. This involves a 50% reduction in agricultural and industrial tariffs and export subsidies, a 50% reduction in OECD domestic support for agriculture, a 50% reduction in the tariff-equivalent of services barriers, and a partial reduction in trading costs, related to trade facilitation measures. Services liberalization involves a 50% or a full reduction in the barriers shown in Table 3-3. The second partial liberalization experiment is called the "Swiss formula" experiment. In this experiment the reduction in import tariffs in agriculture and manufacture is based on a straight Swiss formula with a coefficient of 0.25, meaning the maximum tariff is reduced to 25%. (See Francois and Martin forthcoming). The third scenario simply involves full elimination of all trade barriers. Trade facilitation, based on the range of available estimates, is assumed to range between 1.5 percent of the value of trade (partial liberalization) and 3 percent (full liberalization).

Each experiment is decomposed, both in terms of sectors and instruments, and also in terms of country grouping. An example is given in Table 3-6 were the world welfare effect (equivalent variation) is decomposed across sectoral instruments and regions. Because of the decomposition method used, this means that the reader can pick and choose, combining the results of hybrid experiments involving elements from different experiments, for a rough sense of possible effects. For example, if in the next WTO round, the outcome will be only 50% liberalization in manufactures in

all regions and trade facilitation only in OECD countries, the world welfare effect will be approximately $80 billion ($34 billion due to liberalization in manufacturing and $46 billion due to trade facilitation in the OECD).

Finally, for each of the experiments we can choose between certain model features (these model features are discussed in more detail in section 4.2). First, we can study short-run versus long-run effects. In the short run capital is fixed and in the long run capital can adjust (Baldwin closure). Second, we can assume perfect competition versus imperfect competition in the manufacturing and services sectors. With perfect competition we assume constant returns to scale and with imperfect competition we assume monopolistic competition with increasing returns to scale. For the agricultural sectors (except for the food processing industry) we always assume constant returns to scale. In this study we use the constant returns to scale scenario mainly as a benchmark scenario to assess the impact of the increasing returns to scale features and it facilitates comparison with other studies that mainly use constant returns to scale in all sectors.

Table 3-1

Industrial tariff rates and bindings -- post UR and ITA

	Percent of MFN imports that are subject to:				Tariff lines	
	bound tariffs	unbound tariffs	tariffs bound above applied rates	tariffs unbound or bound above applied rates	Share of bound duty free tariff lines to total tar. lines	Total tariff lines
Argentina	100.0	0.0	99.9	99.9	0.0	10530
Australia	96.9	3.1	31.7	34.8	17.7	5520
Brazil	100.0	0.0	91.0	91.0	0.5	10860
Canada	99.8	0.2	45.7	45.9	34.5	6261
Chile	100.0	0.0	99.7	99.7	0.0	5055
Colombia	100.0	0.0	97.7	97.7	0.0	6145
El Salvador	97.1	2.9	96.0	98.9	0.0	4922
European Union	100.0	0.0	17.7	17.7	26.9	7635
Hungary	93.6	6.4	3.3	9.7	10.4	5896
India	69.3	30.7	14.8	45.5	0.0	4354
Indonesia	92.3	7.7	86.6	94.3	0.0	7735
Japan	95.9	4.1	0.1	4.2	47.4	7339
Korea	89.8	10.2	3.4	13.6	11.6	8882
Malaysia	79.3	20.7	31.0	51.7	1.6	10832
México	100.0	0.0	98.4	98.4	0.0	11255
New Zealand	100.0	0.0	46.5	46.5	39.5	5894
Norway	100.0	0.0	36.5	36.5	46.6	5326
Peru	100.0	0.0	98.5	98.5	0.0	4545
Phillipines	67.4	32.6	15.5	48.1	0.0	5387
Poland	92.8	7.2	44.6	51.8	2.2	4354
Singapore	36.5	63.5	11.7	75.2	15.2	4963
Sri Lanka	9.2	90.8	1.4	92.2	0.1	5933
Thailand	67.4	32.6	8.9	41.5	0.0	5244
Tunisia	67.9	32.1	41.5	73.6	0.0	5087
Turkey	49.3	50.7	0.0	50.7	1.4	15479
United States	100.0	0.0	14.0	14.0	39.4	7872
Uruguay	100.0	0.0	96.3	96.3	0.0	10530
Venezuela	100.0	0.0	90.3	90.3	0.0	5974
Zimbabwe	13.6	86.4	3.9	90.3	3.0	1929

source: Francois (2001), based on WTO and World Bank data on Uruguay Round and post-Information Technology Agreement schedules.

Table 3-2

Summary of Effects of Basic Swiss Formula Reductions

Applied tariffs before and after a 50% cut in average tariff bindings

Agriculture

	post-UR and ITA tariffs				effect of basic Swiss-formula application on tariffs				
	simple average	standard deviation	maximum tariff	binding overhang	simple average	standard deviation	maximum tariff	binding overhang	Percent reduction in average
European Union	5.9	7.5	74.9	0.3	3.0	2.9	10.9	0.1	-48.6
Japan	6.2	8.1	43.3	1.2	3.5	3.7	13.9	0.2	-43.0
United States	3.5	7.4	90.0	0.5	1.9	2.4	11.5	0.1	-46.6
Brazil	12.9	5.1	27.0	22.6	12.4	4.6	22.3	5.3	-3.7
India	31.0	20.8	150.0	90.7	29.5	14.9	70.8	31.3	-4.8
Thailand	26.5	14.4	65.0	7.1	15.1	6.3	30.1	1.7	-43.0

Non-agriculture

	post-UR and ITA tariffs				effect of basic Swiss-formula application on tariffs				
	simple average	standard deviation	maximum tariff	binding overhang	simple average	standard deviation	maximum tariff	binding overhang	Percent reduction in average
European Union	3.7	3.6	17.0	0.4	1.9	1.4	5.0	0.1	-47.7
Japan	2.3	3.4	30.9	0.1	1.2	1.4	5.6	0.0	-48.5
United States	3.2	4.3	37.5	0.2	1.7	1.6	6.1	0.0	-48.3
Brazil	15.9	6.0	35.0	14.9	13.5	4.2	16.7	1.9	-15.4
India	19.2	16.5	40.0	3.9	11.3	9.2	30.5	0.3	-41.3
Thailand	10.5	10.8	80.0	7.8	7.2	6.1	20.7	2.0	-31.6

Source: Francois and Martin (2003, forthcoming).

Table 3-3

Estimated Services Trade Barriers (percent trade cost equivalents)

Label	Region	Trade	transport and logistics	business services	other services
NLD	Netherlands	0.0	0.0	0.0	0.0
FRA	France	12.3	12.1	18.3	19.2
DEU	Germany	0.0	13.7	9.5	0.0
REU15	Rest of EU	12.3	0.0	0.0	0.0
CEEC	CEECs	1.6	0.0	0.0	0.0
MED	Mediterannean and Middle East	2.3	0.0	0.0	0.0
NAM	North America	0.0	22.6	1.2	16.0
SAM	South America	13.8	10.4	8.6	5.9
CHINA	China	0.0	14.5	37.4	3.7
INDIA	India	61.3	63.9	32.1	62.2
HINCAS	High income asia	0.0	0.0	6.3	0.0
OASPAC	Other Asia-Pacific	0.0	0.0	0.0	0.0
AUSNZ	Australia and New Zealand	0.0	2.3	9.5	15.2
SAF	South Africs	28.3	17.5	32.8	22.6
SSA	Sub-Saharan Africa	0.0	0.0	0.0	0.0
ROW	Rest of World	7.2	0.0	0.0	0.0

Based on gravity equation estimates.

Table 3-4

ESTIMATED COST SAVINGS FROM TRADE FACILITATION

European Commission (1992)	In the context of the Single Market program, savings may amount to 1.6 percent to 1.7 percent of the value of trade due to savings on administrative costs
UNCTAD (1994)	costs of transactions represent 7 to 10% of the value of trade. Trade facilitation could reduce this to 5% to 8%.
Australian Industry Commission (1995)	trade facilitation may save 5% to 10% of the total value of trade, through reduced transaction costs, in the APEC context.
Japan EPA (1997)	A “modest” APEC initiative may lead to 2% savings (as a share of the value of trade) due to reduced transaction costs.

Table 3-5

Scenario definitions

Instruments	Linear 50%	Swiss formula	Full liberalisation
Import tariffs in agriculture and manufacturing	50% reduction	Swiss formula reduction (with a max 25% tariff)	100% reduction
Estimated border measures in services	50% reduction	50% reduction	100% reduction
Export subsidies	50% reduction	50% reduction	100% reduction
Domestic agricultural support in OECD countries	50% reduction	50% reduction	100% reduction
Trade facilitation	1.5% of value of trade	1.5% of value of trade	3% of value of trade

Table 3-6: Total welfare gains of linear 50% experiment decomposed by sectoral instruments and regions

	OECD	LDCs	Interaction effects	Total
Agricultural liberalization (border measures)	24482	32446		56928
Agricultural liberalization (domestic support)	8744			8744
Manufactures (border measures)	12057	22230		34287
Services liberalization	17225	6907		24132
Trade facilitation	46159	26152		72311
Interaction effects				15974
Total	108667	87735	15974	212376

Source model simulations

4 The Model and Data

This section provides a brief overview of the global computable general equilibrium (CGE) model used in this study. The model is characterized by an input-output structure (based on regional and national input-output tables) that explicitly links industries in a value added chain from primary goods, over continuously higher stages of intermediate processing, to the final assembling of goods and services for consumption. Inter-sectoral linkages are direct, like the input of steel in the production of transport equipment, and indirect, via intermediate use in other sectors. The model captures these linkages by modeling firms' use of factors and intermediate inputs. The most important aspects of the model can be summarized as follows: (i) it covers all world trade and production; (ii) it allows for scale economies and imperfect competition; (iii) it includes intermediate linkages between sectors; (iv) and it allows for trade to affect capital stocks through investment effects. The last point means we model medium to long-run investment effects. The inclusion of scale economies and imperfect competition implies agglomeration effects like those emphasized in the recent economic geography literature.

4.1 Model Data

The data come from a number of sources. Data on production and trade are based on national social accounting data linked through trade flows (see Reinert and Roland-Holst 1997). These social accounting data are drawn directly from the most recent version of the Global Trade Analysis Project (GTAP) dataset, version 5.2. (Dimaranan and McDougall, 2002). The GTAP version 5 dataset is benchmarked to 1997, and includes detailed national input-output, trade, and final demand structures.

The basic social accounting and trade data are supplemented with trade policy data, including additional data on tariffs and non-tariff barriers.

The data on tariffs are taken from the WTO's integrated database, with supplemental information from the World Bank's recent assessment of detailed pre- and post-Uruguay Round tariff schedules and from the UNCTAD/World Bank WITS dataset. All of this tariff information has been concorded to GTAP model sectors. Services trade barriers are based on the estimates described in chapter three and the technical annex. We also work with the schedule of China accession commitments (Francois and Spinanger 2001).

While the basic GTAP dataset is benchmarked to 1997, and reflects applied tariffs actually in place in 1997, we of course want to work with a representation of a post-Uruguay Round world. We also want to include the accession of China, the enlargement of the EU, and Adenda 2000 reforms as part of the baseline. To accomplish this, before conducting any policy experiments we first run a "pre-experiment" in which we do the following:

- implement the rest of the Uruguay Round tariff commitments,
- implement the ATC phaseout,
- implement China's accession to the WTO,
- implement Agenda 2000,
- and Implement the EU enlargement.

As such, the dataset we work with for actual experiments is a representation of a notional world economy (with values in 1997 dollars) wherein we have realized many of the trade policy reforms already programmed for the next few years.

The social accounting data have been aggregated to 17 sectors and 16 regions. The sectors and regions for the 17x16 aggregation of the data are given in Table 4.1 (a more detailed mapping between the aggregated sectors and regions and the original GTAP regions and sectors is given in technical annex Table 5).

Table 4.1 Sectors and regions

Label	Region		Label	Sector
NLD	Netherlands		CERE*	Cerals
FRA	France		HORT*	Horticulture & other crops
DEU	Germany		SUGA*	Sugar, plants and processed
REU15	Rest of EU		INTLIV*	Intensive livestock &products
CEEC	CEECs		CATLE*	Cattle & beef products
MED	Mediterannean and Middle East		DAIRY*	Milk & dairy
NAM	North America		OAGR*	Other agriculture
SAM	South America		PROCF	Processed food products
CHINA	China		TEXT	Textiles, leather & clothing
INDIA	India		EXTR	Extraction industries
HINCAS	High income asia		CHEM	Petro & chemicals
OASPAC	Other Asia-Pacific		MELE	Metal and electotechnical ind
AUSNZ	Australia and New Zealand		OIND	Other industries
SAF	South Africs		TRAD	Trade services
SSA	Sub-Saharan Africa		TRAN	Transport services
ROW	Rest of World		BSVC	Business, financial & communnications services
			OSVC	Other private and public services

* denotes a competitive sector

4.2 Theoretical structure

We turn next to the basic theoretical features of the model. More discussion is provided in the separate technical annex. In all regions there is a single representative, composite household in each region, with expenditures allocated over personal consumption and savings (future consumption). The composite household owns endowments of the factors of production and receives income by selling them to firms. It also receives income from tariff revenue and rents accruing from

import/export quota licenses (when applicable). Part of the income is distributed as subsidy payments to some sectors, primarily in agriculture.

On the production side, in all sectors, firms employ domestic production factors (capital, labor and land) and intermediate inputs from domestic and foreign sources to produce outputs in the most cost-efficient way that technology allow. Perfect competition is assumed in the agricultural sectors as indicated in Table 4.1 (notice that the processed food products sector is characterized by increasing returns to scale). In these sectors, products from different regions are assumed to be imperfect substitutes in accordance with the so-called "Armington" assumption. Production under imperfect competition is discussed below.

Prices on goods and factors adjust until all markets are simultaneously in (general) equilibrium. This means that we solve for equilibria in which all markets clear. While we model changes in gross trade flows, we do not model changes in net international capital flows. Rather our capital market closure involves fixed net capital inflows and outflows. (This does not preclude changes in gross capital flows). To summarize, factor markets are competitive, and labor and capital are mobile between sectors but not between regions.

We model manufacturing and services as involving imperfect competition. The approach followed involves monopolistic competition. Monopolistic competition involves scale economies that are *internal* to each firm, depending on its own production level. In particular, based on estimates of price-cost markups (see the annex), we model the sector as being characterized by Chamberlinian large-group monopolistic competition. (For more on this approach, see Francois and Nelson 2002.) An important property of the monopolistic competition model is that increased specialization at intermediate stages of production yields returns due to specialization,

where the sector as a whole becomes more productive the broader the range of specialized inputs. These gains spill over through two-way trade in specialized intermediate goods. With these spillovers, trade liberalization can lead to global scale effects related to specialization. With international scale economies, regional welfare effects depend on a mix of efficiency effects, global scale effects, and terms-of-trade effects (for more on this, see Francois and Roland-Holst 1997). Similar gains follow from consumer good specialization.

Another important feature involves a dynamic link, whereby the static or direct income effects of trade liberalization induce shifts in the regional pattern of savings and investment. These effects have been explored extensively in the trade literature, and relate to classical models of capital accumulation and growth, rather than to endogenous growth mechanisms. Research in this area includes Baldwin and Francois (1999), Smith (1976, 1977), and Srinivasan and Bhagwati (1980). Several studies of the Uruguay Round have also incorporated variations on this mechanism. Such effects compound initial output welfare effects over the medium-run, and can magnify income gains or losses. How much these "accumulation effects" will supplement static effects depends on a number of factors, including the marginal product of capital and underlying savings behavior. In the present application, we work with a classical savings-investment mechanism (discussed briefly in the appendix, and also in Francois et al 1997). This means we model long-run linkages between changes in income, savings, and investment. The results reported here therefore include changes in the capital stock, and the medium- to long-run implications of such changes.

5 Results

5.1 Global effects

We now turn to the results of the experiments outlines in chapter two. Tables 5-1 to 5-4 present a summary of results at the global level. The tables present a breakdown of the national income effects (technically measured as equivalent variation) resulting from the various policy experiments along the lines of major sector components. Table 5-1 is focused on agriculture, Table 5-2 is focused on manufactures, Tables 5-3 is focused on services liberalization, and Table 5-4 focusses on trade facilitation. The Tables also give a breakdown of the effects of scale economies, through a comparison of a perfect competition version of the model to the one with scale economies and imperfect competition. We consider the increasing returns case to be the most relevant, and unless indicated otherwise, the discussion of results pertains to this version of the model. A different breakdown of national income effects is provided in a separate Annex, which also provides details on the 'Swiss formula" results.

From the initial set of income effect tables, we can see that agricultural liberalization offers a mixed set of results. Liberalization of domestic support in the OECD, on the other hand, is generally positive for the OECD, though with negative consequences for sub-Saharan Africa. We find that significant, though limited, liberalization yields positive results globally, and regionally for Europe, Africa, and most of Asia. However, on net agricultural liberalization is a mixed-bag, with gains in most areas from elimination of domestic support, but with more mixed results from the elimination of border measures. Static results are consistently positive if constant returns to scale (CRS) are assumed, but induced changes in investment, combined with the imperfect competition features of the model, point to negative effects over the longer-run.

Specifically, we find unexpected welfare effects from agricultural liberalisation in the following cases:

- Australia and New Zealand, who are both net agricultural exporters, and are generally favouring agricultural liberalization. Those countries are usually expected to gain from improved market access in other countries.
- Mediterranean countries who are close to the EU and are usually expected to gain from liberalization in the heavily protected EU agricultural markets.
- Other non-OECD countries (India, China, South Africa, SSA) who do not liberalize themselves and loose when their access to OECD markets is improved.
- Gains for South America are very limited. As a big agricultural exporter, they are generally expected to gain more from liberalization.

In order to understand these unexpected results it is important to distinguish the standard perfect competition and CRS case, which most other studies use, from our modeling of industrial sectors as exhibiting imperfect competition and IRS.

For almost all regions the explanation of the negative welfare results under imperfect competition is straightforward: Due to trade liberalization in agriculture their agricultural sectors expand, because they gain by getting better access to OECD markets. However, the agricultural sectors are all perfectly competitive sectors with constant returns to scale. The expanding agricultural sectors draw resources from industrial sectors. As a consequence, the industrial sectors have to contract, which has negative implications for welfare because they cannot achieve cost effective scales of production. Therefore, the unexpected negative welfare effects are due to the presence of scale economies in some parts of the economy. This is a general point: If

liberalization leads to specialization and expansion of CRS sectors, this is often inferior compared to a policy-induced expansion in IRS sectors. In the latter case, the traditional gains from liberalization are magnified by additional opportunities to utilize economies of scale.

Our results highlight the importance of taking a long-term structural view. CAIRNS group countries should perhaps be cautious about expecting long-term economy-wide gains if, as a result of liberalization, the agricultural sector draws more resources away from other productive uses. Developing countries also need to think carefully about the risks of reinforcing an emphasis on primary exports.

The pattern for manufacturing liberalization is more consistent and positive, both in the initial static results, and over the long-term. From Table 5-2, the most important area for manufacturing tariff liberalization is the developing countries. Recall from the discussion in chapter three that OECD tariffs are, on average, below 3 percent for manufacturing. As a result, the impact of a Swiss-formula (which targets high tariffs) yields only limited effects on the OECD, while directly proportional cuts have a more dramatic effect. At the extreme, we identify between an initial (static) effect of between $35 and $55 billion. The one region consistently, and significantly, hurt by significant manufacturing liberalization is China. This follows from an erosion of its terms of trade, driven by its growth in textile exports, combined with increased competition from other low wage countries (see the export effects in the annex tables). Natural competitors, such as India, currently limit their participation on world markets through a mix of import and export barriers. Rationalization in this area by developing countries leads to heightened competition against China in a number of sectors, with the result being income losses for China driven almost entirely by manufacturing and agricultural liberalization in the developing world.

Another important source of gains is services, which yields static income gains on a par with remaining manufacturing tariffs, ranging, potentially, to over $50 billion globally. One obvious winner from services liberalization is the United States, which is projected to pick up a substantial share of total gains. Another big winner in services, however, is somewhat less obvious. India, which has moved in recent years to become a major exporter in services (including software and back office services) is projected to be a bigger potential winner from services liberalization than North America. In fact, as a share of GDP, services is a more important source of gains for India than agriculture and manufacturing liberalization combined. The other important source of gains for India (and for much of the world) is trade facilitation. In the Asia-Pacific region, where exports alone are often 50 percent of GDP, trade facilitation yields a dramatic short-run effects as well as a long-run impact driven by investment effects (Table 5-4). For the Asia-Pacific developing countries, the single most important issue is trade facilitation, particularly by other developing countries.

Further detail on labor market and trade effects is provided in the annex tables. In general, both unskilled and skilled workers gain from the partial and full liberalization scenarios in most regions, except for some cases in the CEEC economies and China. In China, the results are linked to the trade and income effects following from competition with other low-wag exporters, as discussed above. The general pattern of wage effects is summarized in Figure 5.1, which shows percent changes in wages for unskilled workers in all regions, under all three scenarios. While this figure is somewhat difficult to read in detail, the basic pattern is clear – positive wage effects everywhere, under all scenarios, except for China in all cases and the CEECs in some cases.

The general pattern of export effects, reported in detail in the annex tables, is summarized in Figure 5.2. Like the Figure 5.2, the emphasis here is not on individual values, but the general pattern of results. Export growth, under all scenarios, is greatest in the developing countries, especially in Asia and the Pacific (including India and China), but also in the Mediterranean, African, and Latin American economies. The CEECs suffer from trade-erosion with respect to market access to the EU15 economies.

Table 5-1

Agricultural Liberalization

Static National Income Effects, millions of dollars (based on equivalent variation)

	Constant returns to scale			Increasing returns to scale							
	50% liberalisation of border measures			50% liberalization of border measures			Full liberalization or border measures			OECD Domestic Support	
	Total	OECD	LDCs	Total	OECD	LDCs	Total	OECD	LDCs	Partial	Full
Netherlands	139	-227	366	768	319	449	1,436	112	1,324	-16	119
France	657	193	464	1,661	1,524	136	3,312	2,543	769	2,746	4,320
Germany	809	441	368	2,307	2,122	184	4,855	4,181	674	1,110	1,534
Rest of EU 15	2815	1723	1092	5,042	4,914	128	8,651	7,647	1,004	4,576	7,069
CEECs	263	575	-312	1,702	1,143	559	4,348	2,023	2,325	-2	-202
Mediterranean	4293	269	4024	15,008	-794	15,802	22,232	-2,112	24,344	-600	-1,369
North America	3098	1358	1740	2,678	1,501	1,177	4,356	1,128	3,228	2,173	3,881
South America	2848	2052	796	2,054	162	1,892	4,366	392	3,973	-152	-289
China	1439	755	684	2,993	-374	3,367	3,549	555	2,993	-252	-577
India	165	69	96	756	-76	832	1,196	-205	1,401	-6	-35
High Income Asia	7737	7125	612	16,127	14,163	1,964	26,998	21,930	5,068	-504	-977
Other Asia-Pacific	1035	768	267	3,673	1,007	2,667	6,550	2,526	4,024	-85	-173
Australia-NZ	1261	969	292	-350	-419	70	-499	-721	222	70	185
South Africa	418	90	328	1,257	-84	1,341	2,057	-207	2,264	-38	-115
Sub-Saharan Africa	649	457	192	1,394	-194	1,588	3,162	-455	3,617	-92	-248
Rest of World	275	201	74	-141	-432	291	174	-527	700	-184	-755
Total	27901	16818	11083	56,928	24,482	32,446	96,743	38,811	57,932	8,744	12,368

Table 5-2

Manufacturing Tariff Reductions
Static National Income Effects, millions of dollars (based on equivalent variation)

	Constant returns to scale			Increasing returns to scale					
	50% liberalisation of border measures			50% liberalization of border measures			Full liberalization or border measures		
	Total	OECD	LDCs	Total	OECD	LDCs	Total	OECD	LDCs
Netherlands	303	-178	481	947	-18	965	1,586	-315	1,901
France	981	-134	1115	2,189	386	1,803	4,649	431	4,218
Germany	1910	-125	2035	3,397	322	3,075	6,002	-719	6,721
Rest of EU 15	2689	-964	3653	7,367	534	6,833	12,018	-2,016	14,033
CEECs	-3418	-2159	-1259	4,102	2,118	1,984	12,755	6,715	6,040
Mediterranean	189	1362	-1173	-1,133	1,310	-2,443	-3,206	2,186	-5,392
North America	543	-3917	4460	13,226	2,590	10,636	22,104	548	21,556
South America	203	1088	-885	-2,450	839	-3,289	-7,286	1,765	-9,051
China	1477	4175	-2698	-23,717	-9,444	-14,273	-37,826	-10,398	-27,428
India	357	548	-191	-499	427	-926	-3,991	778	-4,769
High Income Asia	9642	2088	7554	22,859	8,473	14,386	37,669	11,327	26,343
Other Asia-Pacific	1601	3140	-1539	3,244	2,320	924	1,701	3,932	-2,231
Australia-NZ	-169	-198	29	787	130	657	704	-471	1,174
South Africa	240	94	146	621	248	373	1,013	446	567
Sub-Saharan Africa	-128	75	-203	-156	242	-398	-574	452	-1,026
Rest of World	1214	727	487	3,503	1,579	1,924	6,928	2,705	4,222
Total	17634	5622	12012	34,287	12,057	22,230	54,247	17,367	36,880

Table 5-3

Services Liberalization
Static National Income Effects, millions of dollars (based on equivalent variation)

	Constant returns to scale			Increasing returns to scale					
	50% liberalisation of border measures			50% liberalization of border measures			Full liberalization or border measures		
	Total	OECD	LDCs	Total	OECD	LDCs	Total	OECD	LDCs
Netherlands	98	67	31	814	637	178	1,130	892	238
France	2281	2212	69	4,825	4,576	249	2,802	2,262	540
Germany	2296	2220	76	4,451	4,431	20	4,412	4,092	320
Rest of EU 15	798	587	211	2,830	3,034	-205	4,342	3,390	953
CEECs	172	193	-21	3,327	2,623	704	970	623	347
Mediterranean	636	558	78	2,863	2,290	573	2,525	2,146	379
North America	8742	8461	281	11,872	14,856	-2,985	16,260	14,805	1,456
South America	2026	315	1711	5,556	1,288	4,268	4,109	1,258	2,852
China	793	279	514	4,647	-1,596	6,243	1,524	-93	1,617
India	1957	44	1913	21,601	-199	21,800	4,657	132	4,525
High Income Asia	1722	1577	145	1,444	2,670	-1,225	4,257	3,960	297
Other Asia-Pacific	325	329	-4	197	-1,300	1,497	1,522	1,252	270
Australia-NZ	670	654	16	1,541	1,612	-71	1,569	1,523	46
South Africa	555	36	519	971	117	854	1,086	196	890
Sub-Saharan Africa	102	73	29	490	341	149	394	332	62
Rest of World	354	313	41	688	730	-42	1,493	1,277	216
Total	23527	17918	5609	68,116	36,109	32,007	53,053	38,046	15,007

Table 5-4

Trade facilitation

Static National Income Effects, millions of dollars (based on equivalent variation)

	Constant returns to scale			Increasing returns to scale					
	50% liberalisation of border measures			50% liberalization of border measures			Full liberalization or border measures		
	Total	OECD	LDCs	Total	OECD	LDCs	Total	OECD	LDCs
Netherlands	1058	944	114	1,436	1,123	313	2,910	2,314	596
France	1858	1670	188	2,183	1,858	325	4,615	3,922	693
Germany	2607	2366	241	3,475	2,709	766	7,161	5,683	1,478
Rest of EU 15	6654	6050	604	8,188	6,431	1,757	16,462	13,201	3,261
CEECs	-13	84	-97	1,804	1,253	551	4,576	3,108	1,469
Mediterranean	3974	205	3769	4,305	681	3,624	8,621	1,248	7,373
North America	10952	9938	1014	14,150	10,857	3,293	27,519	21,626	5,893
South America	4863	946	3917	4,440	884	3,556	9,365	1,800	7,565
China	6046	1399	4647	-1,675	-775	-900	3,097	682	2,415
India	1197	288	909	1,189	320	869	2,424	649	1,775
High Income Asia	14556	13622	934	19,755	15,419	4,336	37,790	30,686	7,104
Other Asia-Pacific	5451	1146	4305	7,545	2,246	5,299	15,320	4,516	10,804
Australia-NZ	1343	1271	72	1,348	1,077	271	2,589	2,134	455
South Africa	638	135	503	799	198	601	1,625	401	1,223
Sub-Saharan Africa	868	90	778	1,052	178	874	2,342	395	1,947
Rest of World	1105	1050	55	2,315	1,698	617	4,454	3,324	1,130
Total	63157	41204	21953	72,311	46,159	26,152	150,870	95,690	55,179

Figure 5-1

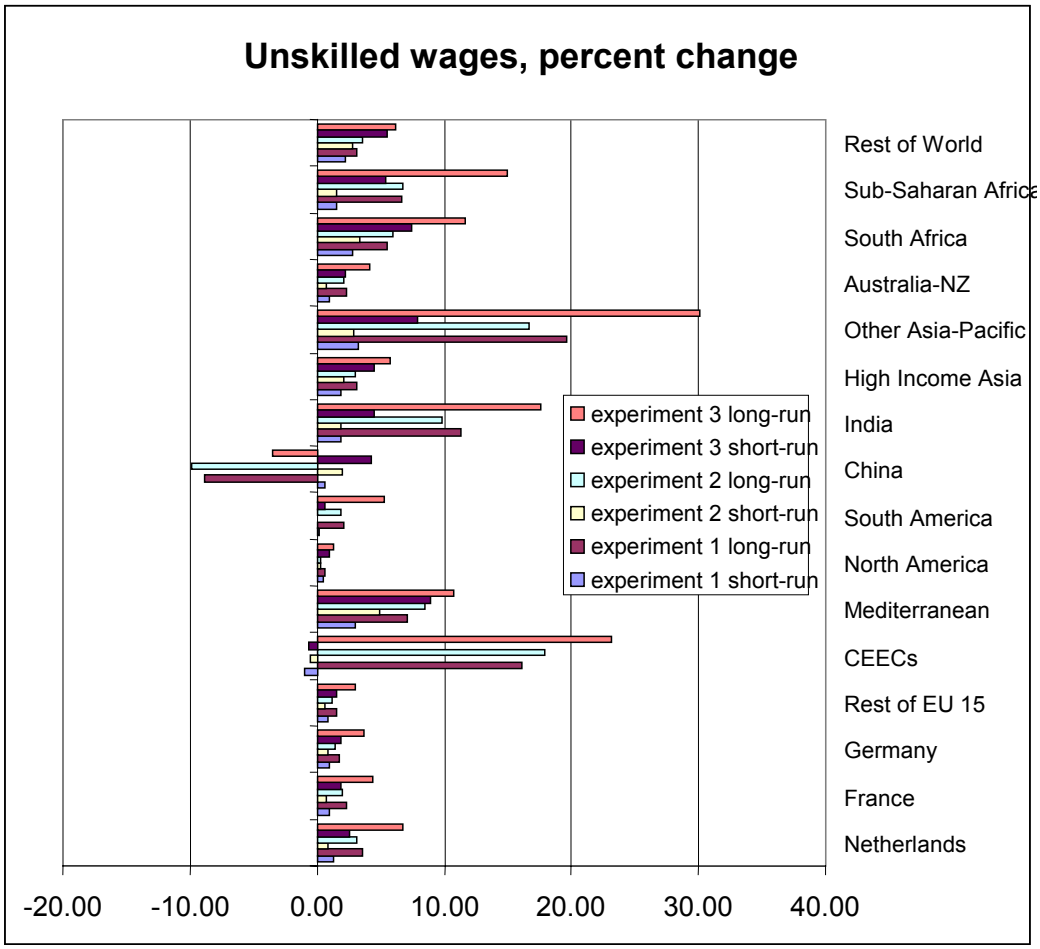
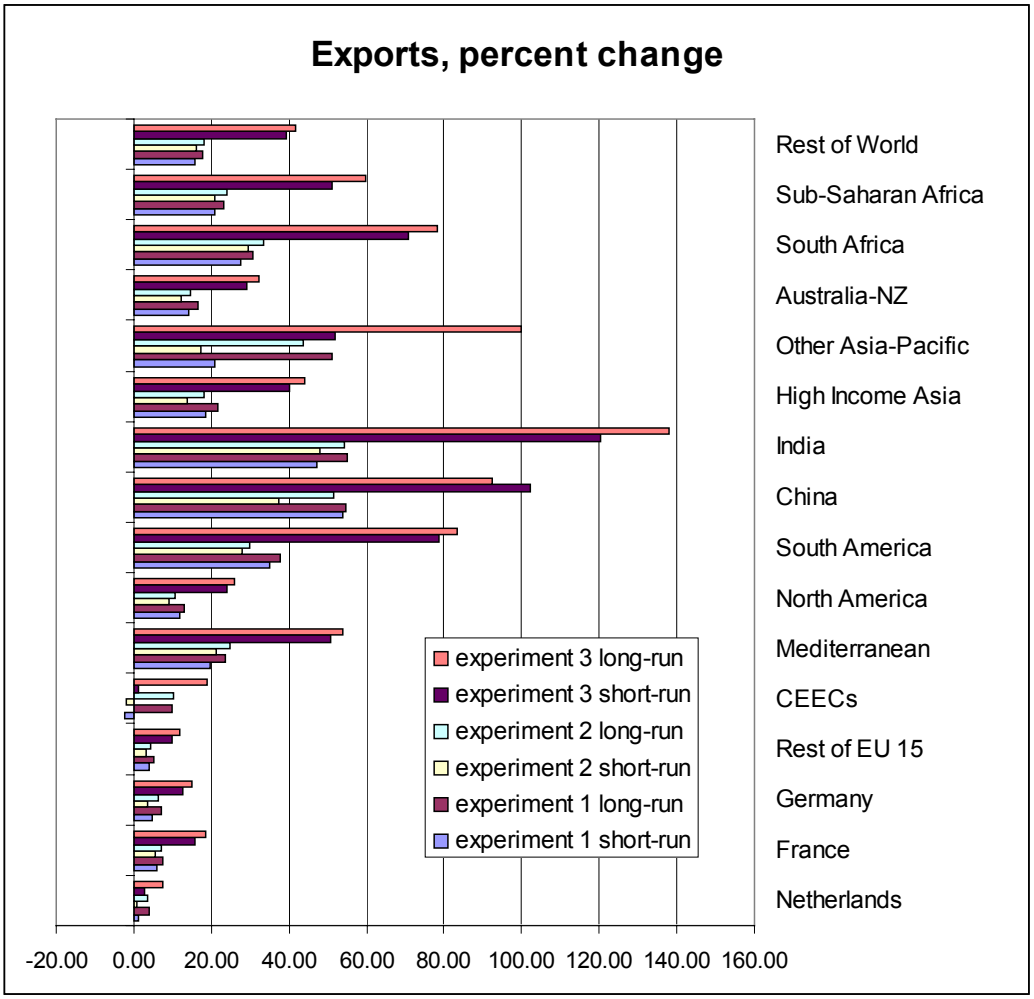

Unskilled wages, percent change
Rest of World
Sub-Saharan Africa
South Africa
Australia-NZ
Other Asia-Pacific
High Income Asia
India
China
South America
North America
Mediterranean
CEECs
Rest of EU 15
Germany
France
Netherlands
experiment 3 long-run
experiment 3 short-run
experiment 2 long-run
experiment 2 short-run
experiment 1 long-run
experiment 1 short-run
-20.00
-10.00
0.00
10.00
20.00
30.00
40.00

Figure 5-2


Exports, percent change
Rest of World
Sub-Saharan Africa
South Africa
Australia-NZ
Other Asia-Pacific
High Income Asia
India
China
South America
North America
Mediterranean
CEECs
Rest of EU 15
Germany
France
Netherlands
experiment 3 long-run
experiment 3 short-run
experiment 2 long-run
experiment 2 short-run
experiment 1 long-run
experiment 1 short-run
-20.00
0.00
20.00
40.00
60.00
80.00
100.00
120.00
140.00
160.00

5.2 Results for the (enlarged) European Union

The European Union is a customs union, with a common external tariff against supplies from third countries, and practically zero tariffs within the union. Lower external trade barriers affect producers and consumers in member states in two related ways. First there is the direct boost to competition on home markets through improved market access for suppliers from outside the European Union. Second, the relative position of suppliers within the EU might change. The formation of the EU customs union leads, by definition, to trade preferences amongst the members of the free trade area. As a consequence the share of trade that is within the EU (intra-EU trade) is typically biased upward, and trade within the EU is larger than might be expected on the basis of geographic proximity and other trade promoting factors alone. With the recent eastward enlargement the preferences are extended from the current 15 EU members to the new member states.[6] Recall that the enlargement process has been incorporated in our baseline scenario.

The lowering of external trade barriers by the EU will inevitably lead to the erosion of the intra-EU trade preferences. Suppliers with lower cost will be able to enter the EU markets once the tariff barriers have come down that currently shield domestic producers from foreign competition. Consequently, we can expect the current bias towards intra-EU trade to be reduced. Table 5-5 nicely illustrates this effect by breaking down the simulated change in EU27 import values for one of the more modest liberalisation scenarios.

The 2% growth in EU27 exports is small compared to the 12% growth in world trade. A first driver of this result is that EU countries mostly trade amongst themselves. The benefits from removing the intra-EU barriers have already been

[6] Our simulations include all 12 accession candidates newcomers, i.e. we also include Bulgaria and Romania, although these two countries will not enter the EU with the first wave of new member countries.

realised in the past and there are no additional gains for intra-EU trade in a new WTO round. A second driver of this result is the increased competition from non-EU countries on EU markets. Simulated intra-EU27 trade shrinks by -6% as other suppliers enter the EU markets.

Table 5-5: Percent change in value of bilateral exports (f.o.b.), linear 50% cuts (*)

↓ from → to	EU27	LDCs	Other	Total exports
EU27	-6	21	13	2 (4)
LDCs	30	39	25	30 (38)
Other	12	26	8	14 (15)
Total imports	3 (5)	28 (35)	14 (15)	12 (15)

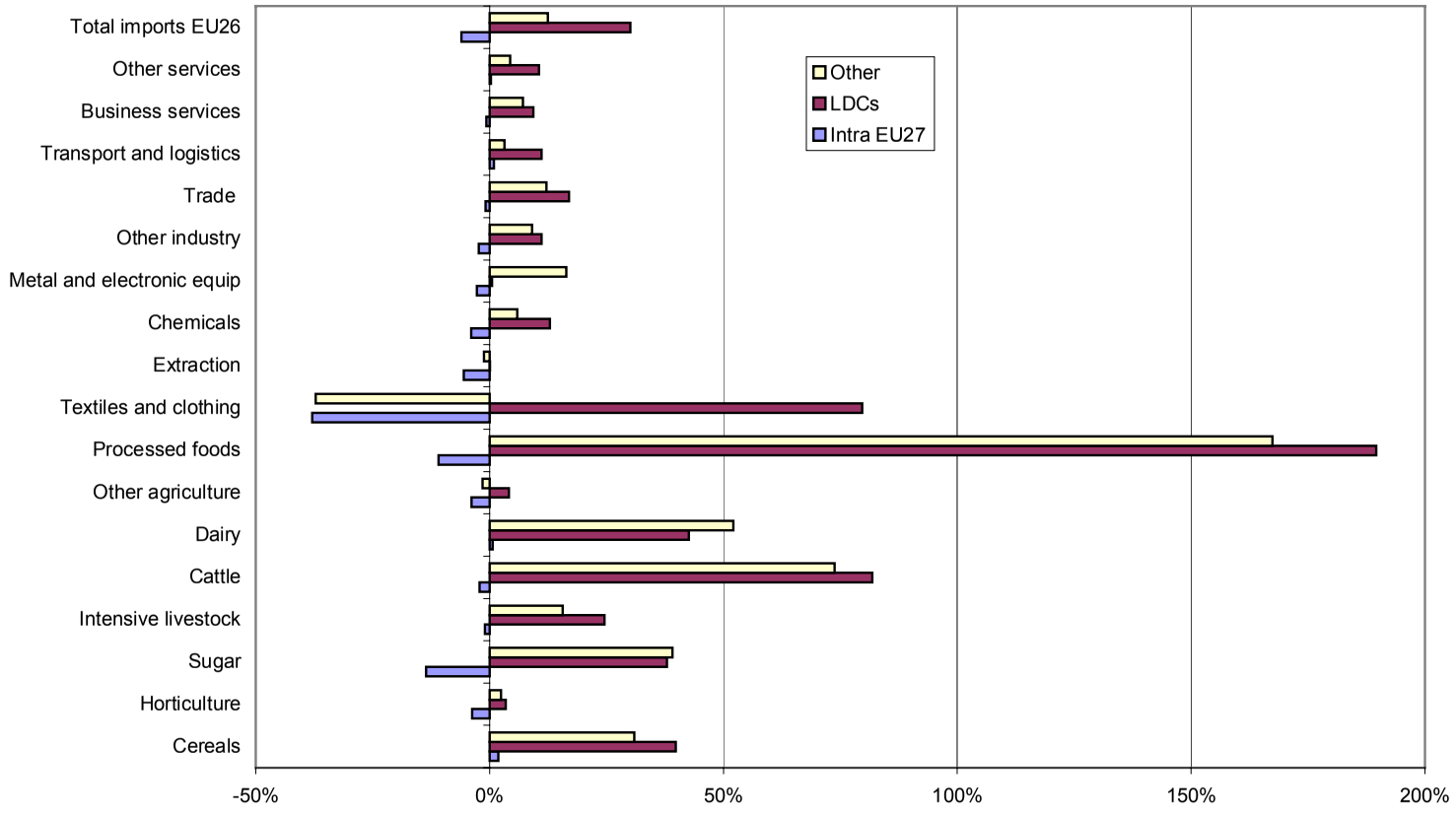
Source: Model simulations.
Note: (*) Short run results with scale economies. Long run results in brackets.

The most impressive growth in markets share is realized by suppliers from LDCs, who are simulated to expand their exports to the EU by 30%, compared to the 12% increase of imports from other developed countries.

Because there is no positive growth to be expected from intra-EU trade, European exports can only by increased by expansion in non-EU markets. Exports to LDCs grow with 21% and exports to the other regions grow with 13%. Although these growth figures are high, this is insufficient to significantly boost total exports as their weight in total EU27 exports is limited.

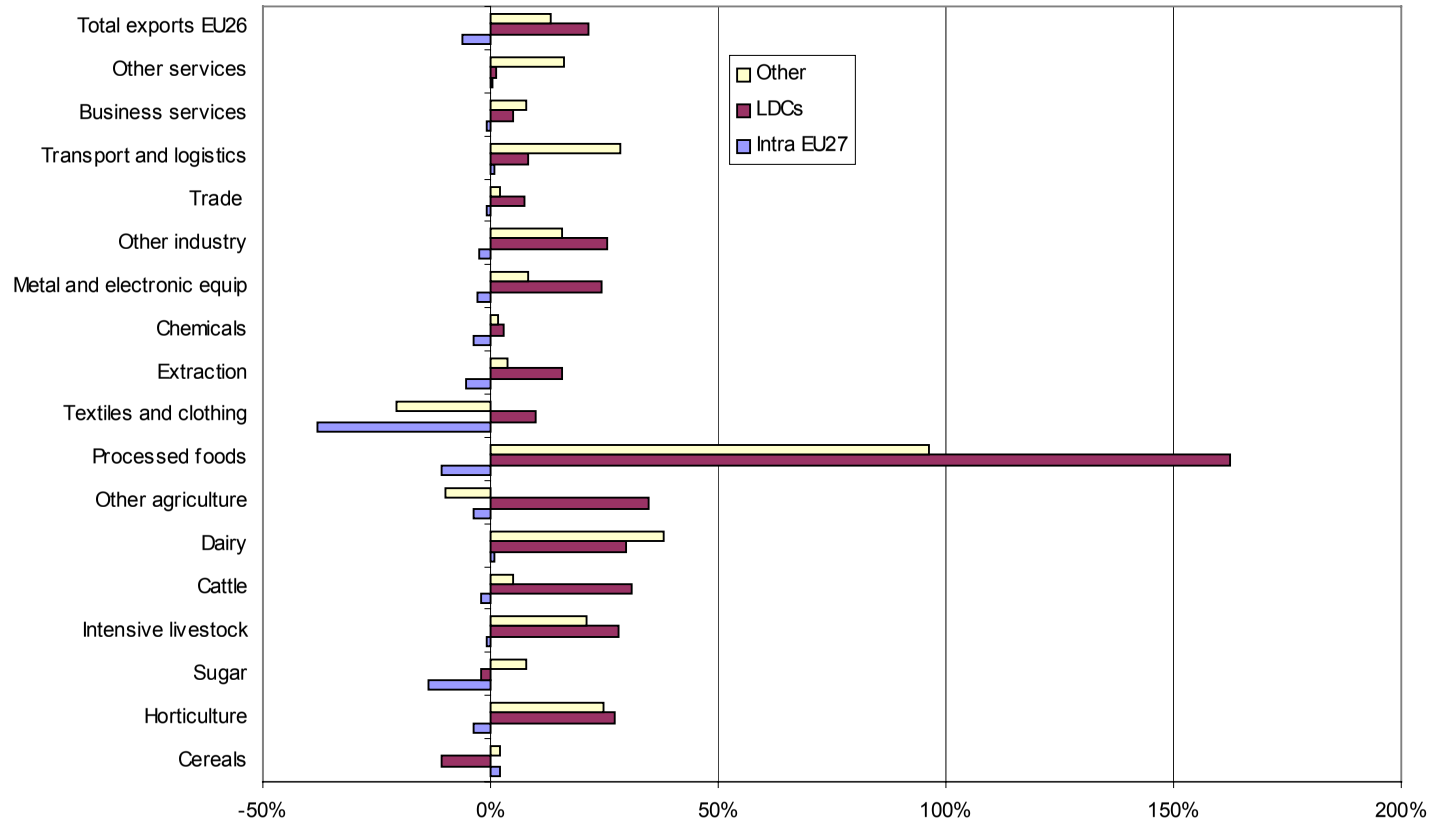
LDCs obtain the highest growth in exports (30%). They are simulated to expand exports to all destinations, but the largest trade surge is observed for intra-LDC trade. Global trade creation in this experiment amounts to 12% in short run and 15% in long run. While the trade increase materialises already in the short run for the EU and other developed economies, LDCs see even larger growth in their exports in the longer term. Dynamic capital accumulation enables them to specialise more in exportable goods.

Figure 5-3: Percentage change in EU27 imports by source (50% linear cuts in tariffs and domestic agricultural support)



Source: Model simulations

Figure 5-4: Percentage change in EU27 exports by destination (50% linear cuts in tariffs and domestic agricultural support)



Source: Model simulations

On balance, imports into the EU increase slightly faster than exports. What does this imply for individual industries in the European Union? A rise of imports in some highly protected sectors is to be expected. The pre-simulation landscape of import tariffs shows that the average import barriers for agricultural products (cereals, sugar, cattle, dairy and processed food) and textiles are the highest. Figure 5-3 shows that simulated imports rise as expected for these industries. The import growth for sugar and dairy is lower than might be expected on the basis of the initial import protection. This is caused by the output quota system, which limits the production decline as long as there are positive quota rents. The immediate impact of increased import competition is lower quota rents, and therefore lower internal EU prices. Production would only fall dramatically if quota rents were fully eroded, and this is not the case in our simulations. The lower internal prices make EU a less attractive export destination, and hence imports raise less than expected.

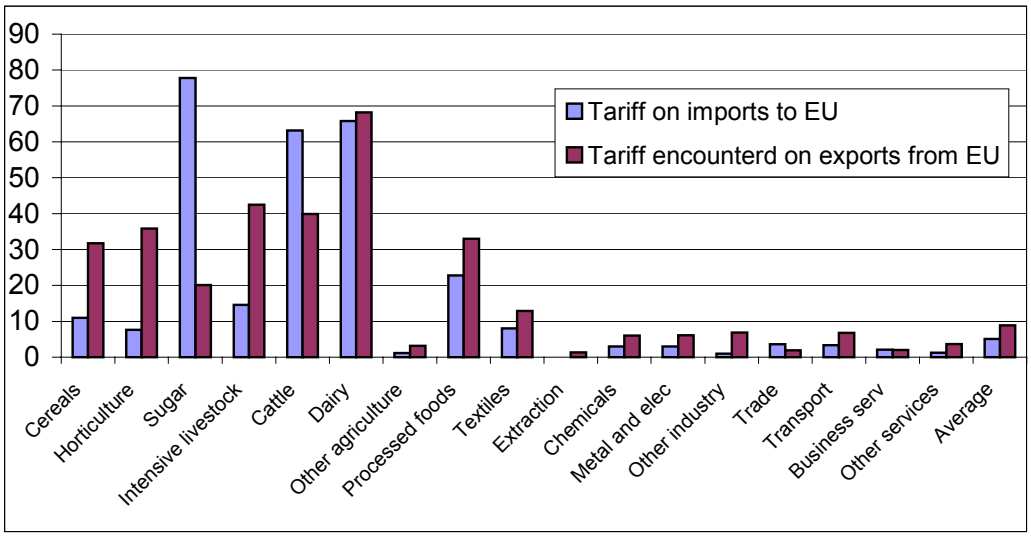
The pre-simulation landscape of import tariffs also shows that average barriers encountered on EU exports are sometimes higher than the barriers erected by the EU (Figure 5-5). Hence, we can expect a growth of extra-EU exports to some destinations. Export growth may even occur for agricultural exports that are currently subject to export subsidies, which we reduce in the liberalisation scenario.

Remarkable is the surge of trade in processed food. While it is consistent with recent empirical observations on the shifting composition of agri-food trade towards more trade in processed products (Hertel et al, 1999, Berkum and van Meijl, 2001), the explanation of this simulation result can be found in the data modelling assumptions.

Figure 5-5 shows that the average tariff on processed food in the EU27 equals a significant 23% of the value of the product. But also processed food products

exported from the EU have to climb an even higher barrier: 33%. Consequently, a simulated tariff reduction of 50% leads to a notable reduction of import prices, both in the EU as elsewhere. Another factor contributing to the expansion of trade is the assumption of scale economies in the processed food industry. Scale economies tend to promote more regional specialisation, and therefore they lead to more trade. As production is more concentrated in certain regions, rather than being spread out over diverse locations each serving a relatively narrow home market, more trade between regions will occur. An export-oriented region, with an existing specialisation in this sector can be expected to see food processing activities expanding. Within the EU this leads to the Netherlands, and to a lesser extent France, to expand in processed foods, while other EU regions see a slight contraction of the industry (Table 5-6). Other regions seeing an expanding food processing industry are South America and Australia-New Zealand. All these regions have already a comparative advantage in processed food (see Annex Table A-3, where the self-sufficiency indicator may be seen as an indicator of comparative advantage) and protection encountered on their exports is relatively high (see Annex Tables A-1 and A-2). An expanding processed food sector stimulates both domestic production and imports of primary agriculture from LDCs.

Figure 5-5: Average import tariffs (%) on extra-EU trade (base situation)



Source: GTAP database, author's calculations
Note: Tariffs are given as trade-weighted averages of *ad valorem* tariff equivalents.

Trade (both exports and imports) between the EU and LDCs is growing relatively faster in our experiments than trade with developed countries. Already low trade barriers amongst OECD countries explain this. An interesting case is Textile and Clothing. Recall that our experiment assumes that MFA is already phased out (this is part of the baseline simulation), and the trade liberalisation experiment subsequently lowers the import tariffs on textiles and clothing. This greatly boosts exports from LDCs into the EU, and it crowds out the imports from developed economies.

The services industries are the only sub sector within the EU that does not see intra-trade shrinking. Especially transport services display positive growth rates in wake of rising trade volumes.

The greater openness to imports and the opening of new export opportunities for products form the EU has some consequences for the development of output. These output developments are triggered on the one hand by trade developments

induced by reduction in trade protection and, on the other hand, by the importance of international trade in sales. Only when a relatively large share of domestic production is exported, does export growth coincide with growth in production. Table 5-6 shows the percent change in output for the EU regions. As can be expected from the initial high protection on agricultural products, output developments for cereals are negative for all EU countries. Those EU members that rely heavily on imports and face heavy import competition, such as Germany, Rest EU15 and especially the Netherlands (see self-sufficiency index in Annex table A-3), witness the highest reduction in production. Production in France is decreasing as it faces stiffer competition on EU markets. For the Central and Eastern European countries production is almost unaltered because they are self-sufficient and an increase in trade does not change domestic production. The cattle and beef sector in the EU declines due to increased imports from especially South America and NAFTA. Production in the quota regulated dairy and sugar sectors does not change in the EU regions because production stays on quota and quota rents decline but remain positive. The development in production of processed food is explained before. The big net exporters within the EU, France and especially the Netherlands, increase output while output contracts in the other regions.

Textile production in the EU decreases due to increased import competition from China and India. This is especially affecting the only big net exporting textile producer within the enlarged EU, Central and Eastern European Countries (CEEC), whose production declines with 36%. However, we have to be aware that the enlargement impact is already part of the baseline. During the enlargement process textile production in CEEC countries expanded rapidly, driven by increased exports to the EU15 countries. The new WTO round erodes the preferences associated wit EU

membership reduces and therefore reverses the process. A similar observation could be made for textile and clothing imports from Turkey, which currently enjoys preferential access to EU markets.

Table 5-6: Percent change output (volume index), linear 50% cuts

	Netherlands	France	Germany	Rest of EU15	CEEC candidate countries
Cereals	-19	-10	-12	-12	2
Horticulture	-1	4	4	4	2
Sugar	0	0	0	0	-4
Intensive livestock	1	2	-1	1	1
Cattle	-2	-8	-5	-8	0
Dairy	0	0	0	0	3
Other agriculture	0	2	0	0	6
Processed foods	8	3	-3	-1	1
Textiles	7	-11	-24	-26	-36
Extraction	-2	-3	-1	-2	6
Chemicals	-2	0	-1	-1	2
Metal and elec	-15	1	1	-1	454
Other industry	-2	1	-2	0	47
Trade	0	0	0	0	3
Transport	18	1	0	5	17
Business serv	0	-1	0	0	4
Other services	0	0	0	0	3

Source: Model simulations.

For manufacturing and services, we simulate rather limited production responses within the EU. Small production effects are observed for trade services, business services and other services. Although these sectors obtain a positive growth in their exports, this does not significantly influence their production because these services are still predominantly operating at the national level. Their exports and imports form are a relatively small share of production (Their self-sufficiency indicator equals about 1 for all services sectors in every EU region).

An exception is transport and logistics, where we observe notable production increases within the EU due increased trade volumes. The transport and logistics

sector facilitates the shipment and distribution of larger trade volumes. Production expands especially in the Netherlands.

Within manufacturing the only big change in production is in the Metal and electro technical industries, which contract in the Netherlands and expand in CEECs. One should not overestimate the effect in CEECs. The sector in the CEECs is very small and it partly recovers from the simulated production slump during the enlargement process. The case for the Netherlands will be explained in the next chapter.

5.3 Results for the Netherlands

Sectoral effects of liberalisation basically follow existing specialisation patterns, as discussed in chapter three. Changes in export values (Table 5-7) reveal that the processed foods industry and services are able to significantly expand their exports, while manufacturing industries and agriculture, except dairy, clearly experience tougher international competition. We have already elaborated in the previous section on the shrinking intra-EU trade, which accounts for about three quarters of Dutch exports. While the European integration has created preferential trade amongst EU members, this advantage is eroded in the process of multilateral trade liberalisation. However, the diversion effects are not large, since in general, OECD tariffs on manufactures have already come down to low levels during the past decades, and current barriers on Dutch exports are already low. As a consequence of less trade with EU members, most products can only increase their exports by finding new markets outside the EU. The scope for such compensation is, however, limited to a few sectors and regions.

We find that export growth is a main driver for output growth in the following sectors:

- Processed food: the sector is highly dependent on exports and currently encounters relatively high barriers on its export markets. Hence lower barriers enable the sector to gain better access to export markets, which allows utilisation of returns to scale.
- Transport services: the sector benefits from global trade expansion. It also benefits from lowering of currently high barriers in other countries. This provides improved access for Dutch companies in foreign markets.

Other sectors are not simulated to expand their production to a significant extent, or are even contracting (Figure 5-6 and Table 5-9). This is explained by the current specialisation patterns as measured by the self-sufficiency index[7] (Figure 5-7). Those products where The Netherlands imports a large share of domestic consumption, such as in the metal and electrotechnical sector have a self-sufficiency ratio below one.[8] Here, we observe an intensified competition with foreign suppliers and an increase in imports as trade barriers into the EU are lowered. As Dutch firms find it more difficult to realize enough sales volumes within the EU, they have to contract output and they are less able to exploit economies of scale (Comparing the second and third column in Table 5-9 highlights the importance of scale economies). As a consequence, their average cost rise relative to international competitors. This can be seen as a continuation of the trend of increasing imports from High Income Asia (Taiwan, South Korea), but also from the upcoming Asian economies, such as China and Vietnam. With lower external protection of the EU, the slight tariff advantage for Dutch producers on the EU market vanishes. This in turn, implies that Dutch producers in the metal and electrotechnical industries find it increasingly difficult to realize their economies of scale, and consequently their competitive position is eroding. To a lesser extent this reasoning also holds in the chemical industries, extraction - and other industries.

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[7] Self-sufficiency is defined as the ratio of domestic production over domestic absorption.

[8] In chapter three we have discussed the issue of re-exports, which is an important phenomenon in Dutch international trade. In our model re-exports are approximated by the share of imports that goes directly to the exporting industry. For example the share of MELE imports that is directly delivered to the Dutch MELE industry equals 80%. Apart from imports of machine parts these imports can be assumed be re-exported after minimal processing.

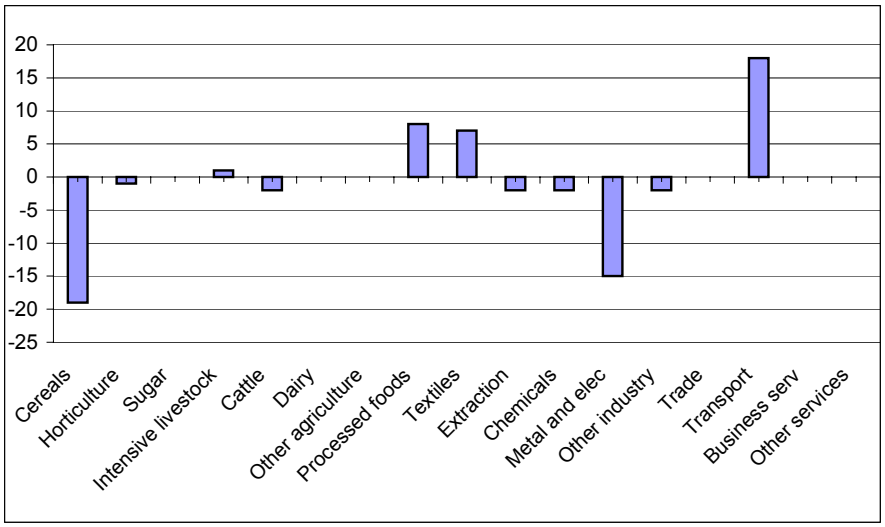
On the other hand, we have the processed food industry and transport services. These are clear net-export products, where self-sufficiency exceeds one, and which are able to expand production. In the processed food industries this is driven by export growth which materializes as barriers to Dutch exports come down. This enables the industry to expand production and to realize further scale economies. In the transport services, the main driver is expansion of trade volumes.

The middle ground is occupied by those sectors where the Netherlands is approximately self-sufficient in production, i.e. where trade does not play a large role. Here, we cannot expect a large impact from improved market access. The share of exports in sales is simply too low to yield a huge production impact from export growth. This is true *a fortiori* for services. While their simulated export growth rates are positive, and their contribution to the trade balance rises, the current low share of international trade yields only a minor impact on domestic production. For example, business services are simulated to expand their sales into South America and Asia Pacific, by respectively 4% and 5.5% in the case of a halving of trade barriers, but this is insufficient to compensate for the loss of sales into EU markets.

There is another factor that contributes to the limited export expansion in services, and indeed in other labour intensive sectors. Real wages in the Netherlands are simulated grow slightly faster under the liberalisation experiments than in the neighbouring countries. This is related to the great expansion of the food processing and transport sectors, which tend to absorb increasing amounts of labour. Consequently economy-wide wages and household incomes are simulated to rise. At the same time this positive income effect translates into slight price rises for the products of labour intensives sectors, such as services. While the terms of trade improve, that is one unit of a commodity produced in The Netherlands earns more on

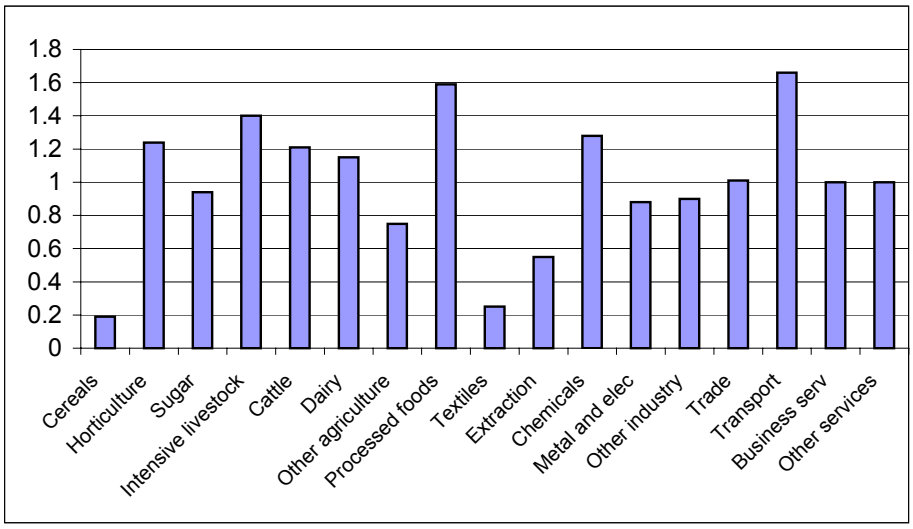
the export market than before liberalisation, it becomes harder to compete internationally.

Figure 5-6: Simulated output effects, The Netherlands (% change, linear 50% cuts)



Source: model simulations

Figure 5-7: Self-sufficieny ratios, The Netherlands (base situation)



Source: GTAP v5, calculations LEI,

Note: self-sufficiency is defined as the ratio of domestic production over domestic absorption

It is often believed that trade liberalisation and limits to domestic agricultural support under WTO disciplines would threaten the agricultural sector in The Netherlands. The findings obtained from the simulations do not support such pessimism in general. In this regard, our findings are in line with a recent report by the Dutch Ministry of Agriculture Nature Management and Fisheries (Meester and Massink, 2002). The EU CAP is predominantly supporting agricultural activities that do not play an important role in the Dutch agri-food complex (cereals, oilseeds, beef). Indeed, our simulations show a decline in those sectors, in the wake of domestic liberalisation, but this decline is not dramatic. Dutch dairy producers appear to be still quota constraint, even in the radical liberalisation scenario. If the quota were removed, and if no environmental restrictions become binding, Dutch dairy production could grow in the long run. Even the heavily protected sugar crop remains to be profitably included in the cropping plan. With cereals becoming the less attractive crop, farmers are simulated to switch to sugar to some extent, in spite of quota rents to be reduced. This is not to say that the sugar trade balance will not deteriorate under the various scenarios. In fact, imports are rising significantly in all agricultural sectors, where import barriers are reduced the most. However, scale economies are less relevant in agricultural sectors and this tends to lead to smaller regional specialisation tendencies and output changes as compared to manufacturing sectors.

For the horticultural sector (food and non-food) we find that the deeper the liberalisation, and the longer the time perspective, the more positive are the growth prospects. Here, the effects are mainly of an indirect nature, since the trade barriers are already quite low.

Although not apparent from our discussion so far, the simulation results also indicate that the Dutch economy stands to gain from eastward enlargement of the EU.

Since enlargement precedes the implementation of the next global trade liberalisation round, Dutch firms can take advantage of the trade preferences within the enlarged EU. A pro-active stance will enable Dutch firms to create a foothold in a growing market.[9] A similar conclusion is reached by CPB (2001c).

Static national income effects for the Netherlands can be substantial and range from 1% to 2% of base GDP (roughly 4 to 7.5 billion USD per year), depending on the size of the cuts and assumptions on scale economies (Table 5-10). These income gains translate into substantial gains in the order of magnitude of several hundred euros per (current) Dutch household. The Netherlands benefits more from trade liberalisation than can be expected on the basis of its share in world GDP. In other words, its share in the global income gains (roughly 2%) exceeds its share in world GDP (1.2%).

The large contributors to this result are services liberalisation and trade facilitation. This is not surprising, since trade facilitation will tend to support the logistic and distribution function in The Netherlands.

[9] Recall that our baseline simulation includes EU enlargement. In the baseline, Dutch exports to CEECs grow with double-digit figures in all sectors except cereals, sugar and textiles.

Table 5-7: Percent change in dollar value of exports

	short-run			long-run		
vxwfob[*NLD]	linear 50% tariff cuts	Swiss formula for tariffs, 50% for other barriers	full liberalization	linear 50% tariff cuts	Swiss formula for tariffs, 50% for other barriers	full liberalization
Cereals	-3	-0.2	-4.3	2	4.6	2.4
Horticulture	-2.4	-1.3	0.8	0.9	1.9	5.4
Sugar	-7.4	-5.6	-10.6	-4.5	-2.5	-7.5
intensive livestock	1.4	1.9	3.7	4	4.4	7.7
Cattle	4.5	4.1	7	6	6.1	8.9
Dairy	7.6	15.9	24.5	9.4	17.9	26.8
other agriculture	-2	-2	-1.8	1.7	2.4	1.7
processed foods	21.1	25.5	50.8	24.4	28.4	53.9
textiles & clothing	9.1	1	-2	95.3	105.9	28.3
Extraction	-3.8	-3.6	-6.6	0.3	0.1	-1.7
Chemicals	-2.4	-1.9	-4.7	-1	-0.6	-2.5
metals and electrical machinery	-13.7	-14	-33.6	-14.2	-16	-27.9
other industry	-1.8	-1.5	-2.5	-1.8	-2.4	-0.6
trade (wholesale, retail)	2.7	2.5	5.3	7.2	5.7	13
transport and logistics	28.1	24.4	65	30.1	28.8	64.7
business services	1.9	2	4.7	2.7	2.9	5
other services	5.5	5.6	12	7.5	7.6	14.5

Source: model simulations.

Table 5-8: Percent change in the dollar value of imports by sector, Netherlands

	short-run			long-run		
Vxwcif	linear 50% tariff cuts	Swiss formula for tariffs, 50% for other barriers	full liberalization	linear 50% tariff cuts	Swiss formula for tariffs, 50% for other barriers	full liberalization
Cereals	14	17	31	18	20	36
Horticulture	3	5	10	7	8	15
Sugar	14	26	41	24	35	54
intensive livestock	6	6	13	9	9	17
Cattle	12	20	38	15	24	43
Dairy	8	14	22	12	18	27
other agriculture	2	3	6	6	7	11
processed foods	29	32	87	32	35	93
textiles & clothing	1	0	3	9	8	8
Extraction	-4	-4	-8	-1	-1	-3
Chemicals	-1	-1	-2	1	1	1
metals and electrical machinery	-1	-1	-3	1	0	1
other industry	2	2	4	4	3	7
trade (wholesale, retail)	1	0	1	-2	-1	-2
transport and logistics	-2	-1	-4	0	0	-1
business services	1	1	1	4	4	7
other services	3	3	6	5	4	9

Source: model simulations.

Table 5-9: Percent change in output by sector, Netherlands

	Short run	long-run			long-run		
	Constant returns to scale	Increasing returns to scale			Increasing returns to scale		
Qo_lrge[*NLD]	linear 50% tariff cuts	linear 50% tariff cuts	Swiss formula for tariffs, 50% for other barriers	full liberalization	linear 50% tariff cuts	Swiss formula for tariffs, 50% for other barriers	full liberalization
Cereals	-30.4	-18.6	-16.8	-29.7	-15.8	-14.3	-26.5
Horticulture	-3	-0.9	0.1	1.1	1.6	2.4	4.4
Sugar	0	0	0	0	0	0	0
intensive livestock	-1	1	1.4	1.8	3.5	3.7	5.6
Cattle	-11.6	-1.8	-3.8	-7.5	-0.2	-2.1	-5.7
Dairy	0	0	0	0	0	0	0
other agriculture	-0.1	-0.2	-0.1	-0.7	1.6	1.8	1.3
processed foods	0.4	7.8	9.9	16.5	10.2	12	18.9
textiles & clothing	-2.7	7.1	-0.1	-4.1	88.7	98.9	25.1
Extraction	-0.9	-1.7	-1.5	-3	0.3	0.2	-0.2
Chemicals	-0.3	-2	-1.6	-3.7	-0.4	-0.2	-1.2
metals and electrical machinery	-1.2	-14.9	-14.8	-35.1	-15.4	-16.9	-29.6
other industry	-0.3	-2.2	-1.6	-4.3	-1.1	-1	-1.5
trade (wholesale, retail)	0	-0.1	-0.1	-0.6	2	1.8	3.2
transport and logistics	4.1	18.4	15.8	42.7	20.4	19.3	43.8
business services	-0.1	-0.1	0	0	1.2	1.2	2
Other services	0.1	0.3	0.4	0.4	2.4	2.4	4.1

Table 5-10: National income effects, based on equivalent variation

	TOTAL as % of Global income effects	TOTAL as % of base GDP	TOTAL as dollar per household	TOTAL as dollar per person	TOTAL, USD mil.
Short run, static IRTS					
Linear 50% cuts	1.8%	1.1%	572	245	3 889
Swiss formula cuts	1.7%	1.1%	556	238	3 779
Full liberalisation	1.9%	2.1%	1109	476	7 544

Source: model simulations.

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