

# **Incidence of trade and subsidy policies on developing country welfare, exports and debt sustainability**

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## **Abstract**

The impacts of all merchandise trade distortions (including agricultural subsidies) globally are estimated using the latest versions of the GTAP database and the LINKAGE model of the global economy (projected to 2015). Results suggest that developing countries' economies bear a disproportionate burden of current distortions, reducing their average income by 0.8 percent (and Sub-Saharan Africa's by 1.1 percent) compared with 0.6 percent for high-income countries. A huge 63 percent of those costs are due to agricultural market distortions, even though agriculture accounts for just 4 percent of global GDP. As much as 93 percent of the cost of those agricultural distortions is due to import barriers and only 2 percent to agricultural export subsidies and 5 percent to direct domestic subsidies to farmers – although within that, the cost of cotton policies is mostly due to domestic support programs. Half of the overall cost to developing countries is due to the region's own policies, partly because they trade with each other fairly intensively and partly because their own trade barriers are higher than those of high-income countries.

If all those trade-distorting measures were to be removed, the developing countries' shares of global output as of 2015 would rise from 70 to 75 percent for primary agricultural goods, and of textiles and clothing from 62 to 65 percent. Developing countries' shares of global exports would rise even more dramatically, especially in agriculture: from 47 to 62 percent in primary farm products and from 34 to 40 percent in processed farm products. That represents a rise in developing country exports of around \$200 billion per year (in 2001 US dollars) – an increase of two-thirds compared with the baseline scenario for 2015 – and in exports of non-agricultural goods of \$400 billion per year. This amounts to more than six times what was needed to service the foreign debt of all developing countries in 2003. Cotton exports alone would rise by more than \$4 billion for developing countries as a whole, almost half of which would be enjoyed by Sub-Saharan Africa. Self-sufficiency in that year would be 102 instead of 100 percent for agricultural products, 121 instead of 118 percent for textiles and clothing, and for other manufactures it would be 100 instead of 101 percent.

# **Incidence of trade and subsidy policies on developing country welfare, exports and debt sustainability**

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To what extent are government trade and subsidy policies, particularly in high-income countries, affecting exports of and welfare in developing countries and thereby their capacity to manage foreign debt?

Since the 1980s, many countries have been reforming their trade and subsidy regimes unilaterally, regionally and multilaterally (although least so for agriculture), and numerous high-income countries have provided preferential access to their markets for exporters of some products from selected developing countries. Nonetheless, substantial trade distortions remain. This paper examines the pattern of remaining distortions and then provides estimates of the market and welfare effects they impose on different developing countries. It does so by making use of a recursive model of the global economy known as LINKAGE, which has formed the basis for the World Bank's standard decade-long projections of global economic prospects.<sup>1</sup> We also make use of the latest GTAP database which has the virtue of including not only reciprocal but also non-reciprocal preferential tariffs, the latter providing low-income exporters duty-free access to some protected high-income country markets. This allows us to take into account the fact that tariffs may improve the international terms of trade for those developing countries that enjoy such preferential access to markets (as well as for net food-importing countries whose comparative advantage is in non-food sectors such as mining or labor-intensive manufacturing.

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<sup>1</sup> The focus of this paper is only on global merchandise trade reform itself. Several of the authors' other studies have concentrated on additional topics—for example possible Doha scenarios, impacts on agricultural markets and farm incomes, poverty impacts, and effects on Sub-Saharan Africa (Anderson, Martin and van der Mensbrugge 2006a,b,c,d,e).

## **Key distortions in global merchandise trade**

Border measures traditionally have been the main means by which governments distort prices in their domestic markets for products, with the relative prices of the various tradables affected by trade taxes-cum-subsidies or quantitative trade restrictions. Product-specific domestic producer or consumer subsidies have played a more limited role (because of their much greater cost to the treasury), with a few exceptions most notably in rich-country agriculture. With the freeing up of most foreign exchange markets over the past two decades, the phasing out of most export taxes, and the conversion of many non-tariff trade barriers into tariffs, the task of measuring the extent of distortions to goods markets is made much easier in that attention can focus mainly on import tariffs and agricultural subsidies. In principle services trade and foreign investment distortions also could distort incentives in the agricultural and industrial sectors, but they are ignored here because much controversy still surrounds their measurement and how they should be modelled.

The latest release of the GTAP dataset, Release 6.05, includes estimates of bilateral tariffs and of domestic and export subsidies as of 2001 for 87 countries and country groups spanning the world. The new protection data come from a joint CEPII (Paris)/ITC (Geneva) project. The product of this joint effort, known as MAcMaps, is a HS6 tariff level detailed database on bilateral protection that integrates trade preferences, specific and compound tariffs and a partial evaluation of non-tariff barriers such as tariff rate quotas (TRQs). The *ad valorem* equivalents (AVEs) of specific tariffs are evaluated using five different reference groups of exporters distinguished by income level to allow for the generally lower unit value of exports from developing countries, and the consequently higher *ad valorem* equivalents of the specific tariffs they face. Trade weights are used to obtain averages from the six-digit level of the Harmonized System up to the broader sectoral aggregates in the model. These weights introduce important differences in bilateral tariff rates at the model level, even between countries facing the same tariff rates at the tariff-line level, and tend to understate the protective impacts of protection because high-tariff items receive relatively low trade weights.

The new GTAP database has lower tariffs than the previous database which related to 1997. This is because of the inclusion of bilateral trade preferences, as well as the major reforms between 1997 and 2001 such as continued implementation of the Uruguay Round agreements,

and China's WTO accession commitments (which alone caused the ratio of global exports plus imports to GDP to rise from 44 to 46 percent over those four years).

According to this dataset, the average import-weighted applied tariff for agriculture and food in 2001 was 16.0 percent for high-income countries and 17.7 percent for developing countries, while for manufactures other than textiles and clothing it was 8.3 percent for developing countries and just 1.3 percent for high-income countries (Table 1). These tariffs are clearly much larger than the export subsidies/taxes and production subsidies in the GTAP database. As shown in Table 2, they are trivial except for high-income agricultural products.

### **The global LINKAGE model for assessing trade and welfare effects of trade distortions**

The model used for this analysis is the World Bank's global dynamic computable general equilibrium (CGE) model, known as LINKAGE (van der Mensbrugge 2005). It is a relatively straightforward CGE model but with some characteristics that distinguish it from standard comparative static models such as the GTAP model (described in Hertel 1997). A key difference is that it is recursive, so while it starts with 2001 as its base year it can be solved annually through to 2015. The projected annual changes result from assumptions about exogenous population and labor supply growth, savings-driven capital accumulation, and labor-augmenting technological progress as assumed for the *Global Economic Prospects* report in World Bank (2005). In any given year, factor stocks are fixed, which means in the case of labor that the extent of unemployment (if any) in the baseline remains unchanged.<sup>2</sup> Producers minimize costs subject to constant returns to scale production technology, consumers maximize utility, and all markets – including for labor – are cleared with flexible prices. There are three types of production structures. Crop sectors reflect the substitution possibilities between extensive and intensive farming; livestock sectors reflect the substitution possibilities between pasture and intensive feeding; and all other sectors reflect standard capital/labor substitution (with two types of labor: skilled and unskilled). There is a single representative household per modeled region,

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<sup>2</sup> The results would change with a different assumption on unemployment, but in a direction that depends explicitly on the assumption made about the workings of labor markets. A reforming economy could be modeled to determine overall employment at current consumer real wages (in which case, a decline in tariffs would almost certainly reduce unemployment by lowering producer real wages), or could be modeled to have rigidities in inter-industry adjustment in which case wages and employment in sectors subject to protection cuts would fall. Since neither assumption is pertinent to all economies, we have chosen to retain the standard long-run assumption of flexible labor markets since we are focusing on adjustment over a ten-year horizon.

allocating income to consumption using the extended linear expenditure system. Trade is modeled using a nested Armington structure in which aggregate import demand is the outcome of allocating domestic absorption between domestic goods and aggregate imports, and then aggregate import demand is allocated across source countries to determine the bilateral trade flows.

Government fiscal balances are fixed in any given year, with the fiscal objective being met by changing the level of lump sum taxes on households.<sup>3</sup> This implies that losses of tariff revenues are replaced by higher direct taxes on households. The current account balance also is fixed, primarily for convenience in this recursive-dynamic model, but also consistent with the Feldstein-Horioka finding of limited international capital mobility (Feldstein and Horioka; Ventura 1980). Given that other external financial flows are fixed, this implies that ex ante changes to the trade balance are reflected in ex post changes to the real exchange rate. For example, if import tariffs are reduced, the propensity to import increases and additional imports are financed by increasing export revenues. The latter typically is achieved by a real exchange rate depreciation. Finally, investment is driven by savings. With fixed public and foreign saving, investment comes from changes in the savings behavior of households and from changes in the unit cost of investment. The latter can play a role in a dynamic model in situations where imported capital goods are taxed. Because the capital account is exogenous, rates of return across countries can differ over time and across simulations. The model only solves for relative prices, with the numéraire, or price anchor, being the export price index of manufactured exports from high-income countries. This price is fixed at unity in the base year and throughout the projection period to 2015.

The version of the LINKAGE model used for this study is based on an aggregation of the GTAP database such that it solves with 27 regions and 25 sectors (see Appendix Table A). There is a heavy emphasis on agriculture and food (the most protected sectors), and a focus on the largest commodity exporters and importers.

The default GTAP database for 2001 is projected forward first to 2005 to create a new database that takes into account key multilateral commitments, namely, the final stages of Uruguay Round implementation including the phase-out of the Multifibre Arrangement (MFA),

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<sup>3</sup> For the sake of simplicity they are fixed in US\$ terms at their base year level, minimizing potential sustainability problems; but this implies they decrease over time as a percentage of GDP for expanding economies.

the final stages of the reform commitments associated with the accession of China and Taiwan to the WTO, and the eastern enlargement of the European Union from 15 to 25 members in May 2004. The effect that pre-simulation has on average tariffs can be seen by comparing those summarized in Table 1(a) for 2001 with those in Table 1(b) for 2005. Its impacts on welfare are non-trivial: had they not been implemented, the gains in 2015 from freeing global merchandise trade would have been an extra \$64 billion per year. Nearly half of that difference is due to the removal of MFA quotas and hence should be considered part of the Uruguay Round's legacy.

### **Effects of current protection policies**

The LINKAGE model provides a baseline projection of the world economy from 2005 to 2015 assuming no other policy changes over that decade. Deviations from that baseline in 2015, due to global trade and subsidy policies as of 2005, are then examined for each region's welfare terms of trade, sectoral outputs and trade.

#### *Welfare effects*

According to the LINKAGE model, by 2015 current trade policies (excluding those affecting services) would be costing the global economy \$287 billion per year (in 2001 US dollars). The distribution across regions of that economic welfare (or equivalent variation in income) cost suggests two-thirds are borne by high-income countries (column 1 of Table 3). However, as a share of national income, developing countries bear more, with an average decrease of 0.8 percent compared with 0.6 percent for high-income countries (column 3 of Table 3). The results vary widely across developing countries, ranging from little impact in the case of Bangladesh and China to 4 or 5 percent in parts of East Asia.

The second column of Table 3 shows the amount of that welfare gain due to changes in the international terms of trade for each country. For developing countries as a group the terms of trade effect is positive, offsetting somewhat the loss from reduced efficiency of domestic resource use (especially in China and India).

The final two columns of Table 3 split the total welfare effect in percentage terms into that due to agricultural and processed food distortions versus those for other merchandise. It shows that nearly two-thirds of the welfare loss in both developing and high-income countries

comes from agricultural and food policies. For Sub-Saharan Africa that ratio is four-fifths, and for Latin America (and Australia/New Zealand) it is more than 90 percent. By contrast, for the more densely-populated developing countries that are already into export-oriented manufacturing, it is the non-agricultural market distortions that affect their welfare most.

There are several other ways to decompose those welfare effects so as to better understand the sources of the waste for each region. One way is to decompose by policy instrument. That generates results very similar to those reported in Hertel and Keeney (2006) and Anderson, Martin and Valenzuela (2006) using the GTAP-AGR model, who estimate that market access barriers explain 93 percent of the welfare effects of agricultural policies, with domestic support and export subsidy removal contributing only 5 and 2 percentage points, respectively.<sup>4</sup>

Another way to decompose the welfare results is by region and sector (Table 4). Those results suggest agriculture and food policies contribute 63 percent of the total global costs. This is consistent with the high tariffs and subsidies in agriculture and food versus other sectors shown in Tables 1 and 2, but is nonetheless remarkable given the low shares of agriculture in global GDP (4 percent) and global merchandise trade (9 percent). Seven-tenths of those costs are accounted for by the farm policies of high-income countries, and those policies also account for the majority of the overall cost to high-income countries. Notice also that the effects on developing countries of high-income country policies are only half as large from textiles as from agricultural policies.

### ***Terms of trade effects***

An important feature of almost all global GE models are the terms of trade impacts, because of the so-called Armington assumption: exporters from each country, no matter how small, are assumed to have some market power because their products are differentiated from those of other countries. This implies that each country could potentially have an optimal tariff

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<sup>4</sup> To help explain these numbers, Anderson, Martin and Valenzuela (2005) first present a back-of-the-envelope calculation which reconciles the numbers in the PSE calculations by the OECD and those in the GTAP database. They then estimate those numbers using the very simplest partial-equilibrium model and get similar shares to those from their full-blown general-equilibrium model. Hoekman, Ng and Olarreago (2004) also reach a similar conclusion from estimating the effects of halving each of the three types of agricultural distortions, in their case using another type of partial equilibrium analysis. Key elements of the reason domestic subsidies are relatively unimportant are: trade measures distort consumption as well as production; import restrictions dominate distortions in developing countries; and trade measures are more variable across products which further adds to their welfare cost.



above zero. As already shown in Table 3, the overall terms of trade impacts for developing countries amount to roughly \$30 billion, a not insignificant benefit compared to the net welfare cost of roughly \$90 billion. Table 5 shows how these terms of trade impacts are allocated between export and import price effects and across broad categories of goods and services.

Focusing first on the aggregate impact for all developing countries, notice that almost all of the net effect comes from the export side, i.e. it is the impact on export prices that explains the terms of trade effect, rather than that on import prices. There is nonetheless an impact of lower food import prices that cut the cost of imports, which is only partially offset by lower export prices. The regions where this is largest are those with the largest food import volume (for example East Asia and Pacific) and/or those with the highest import distortions (for example Middle East and North Africa, and South Asia).

The terms of trade decomposition also suggests that the source of the gain for developing countries via the terms of trade is perhaps not so much due directly to the Armington assumption, but is more linked to the specific external closure rule of the model, i.e. the fixity of the trade balance. If tariffs were removed, the desire to import would increase. With the given closure rule, only an increase in export supply can balance the ex ante increase in import demand and this implies a real depreciation that gets reflected in a decline in export prices. This is the most obvious case since it is manufacturing prices that change the most, and manufacturing is the largest component of trade for developing countries taken in aggregate. Given that on average tariffs are higher in developing countries than in developed countries, it is logical that the terms of trade impacts work in favor of developing countries.

Clearly, we could relax the assumption of fixed trade balances (or equivalently relax the constraint on international capital mobility). This would be consistent with the model results since the returns to capital would increase more rapidly in developing countries than in developed countries as a consequence of trade reform. This relative price change would typically induce international capital movement that could compensate for the real exchange rate's effect on the terms of trade.

### ***Sectoral trade effects***

The results summarized in Table 6 suggest current policies have little impact on high-income countries' shares of global output and exports of processed food and of non-agricultural products. For primary agriculture, however, the developing countries' shares differ noticeably: the export share is 47 instead of 62 percent (including intra-EU trade) and the output share is 70 instead of 75 percent.

The impacts on sectoral exports and imports are shown for each country/region in Tables 7 and 8. Exports would be greater in virtually every region, especially in agriculture and especially for middle-income countries, in the absence of current protection policies. But the same is true of imports, which is necessarily the case if the trade is to remain in balance as assumed here (net of international transport-related services). While a liberalized world would be more trade-oriented, it does not mean there would be wild changes in national self-sufficiency ratios with some industries booming and others collapsing. On the contrary, there would be greater intra-industry trade and hence only modest changes in self-sufficiency, at least for broad sectors such as agriculture. Even Sub-Saharan Africa and Latin America would have a greater export surplus of farm products by only a few percentage points. Notice from Table 9 though that within agriculture, Sub-Saharan Africa would be more import dependent on rice and wheat while exporting a little more coarse grain and a lot more cotton, meat and other crops.

The increase in exports of those farm products from developing countries would be a huge \$192 billion per year. Certainly Latin America accounts for a large part of that increase, but all regions' exports expand and even low-income countries would sell an extra \$36 billion worth of such goods per year (an increase of 52 percent). Also of interest is what happens to food imports: middle-income countries as a group would see them growing less rapidly than farm exports, while low-income countries' imports of those goods would grow only as much as their exports of food and agricultural products, leaving their food and agricultural self sufficiency ratio unchanged. Even for South Asia and China their agricultural self sufficiency levels would fall only one percentage point despite their expansion in exports of labor-intensive manufactures (Table 9).

Such reform also would raise substantially the share of agricultural and food production that is exported globally, from 7 percent in the baseline to 12 percent under free merchandise trade (excluding intra-EU trade – Table 10). Even in the protected countries this ratio rises a

little, because farm resources would move within the sector from import-competing to more-competitive farming activities. This is important because, by thereby ‘thickening’ international markets, food price fluctuations would be dampened, which would reduce concerns about vulnerability to import dependence. The extent of this global public good aspect of agricultural trade reform can be sensed from the results reported for different products in Table 10. Rice and sugar are especially noteworthy: their global shares of production exported would treble. Also noteworthy from that table is the extent to which the developing country shares of global output and especially exports would rise. Their share of global wheat exports would double, for example, and for all agricultural products it would rise from 54 percent to 65 percent.

Of particular importance to Brazil and some Sub-Saharan African countries is the case of cotton, which is receiving special attention in the WTO’s Doha Development Agenda following the Cancun Trade Ministerial in 2003 and the Dispute Settlement case that went against the US in 2004 (Sumner 2006, Anderson and Valenzuela 2006). That is not surprising given the high degree of subsidies cotton receives in the US and the EU and the importance of that product in farm income and exports of several African countries. Under full trade and subsidy liberalization of all goods, global cotton markets would change dramatically: the value of production would fall by one-third or by more than \$5 billion per year in high-income countries (mostly in the US), and the value of their exports would fall by \$3.6 billion. The world totals would hardly change though, as developing country output and exports of cotton would expand by about the same amounts, with Sub-Saharan Africa enjoying more of that gain than any other region (Table 11). Indeed cotton is so important in Sub-Saharan Africa minus South Africa that it would contribute one-quarter of that region’s net gain in agricultural value added from full liberalization. The benefit comes in the form of increased output and exports of cotton, more than in a higher price of Africa’s cotton exports, but the region’s net income from cotton would be \$1.1 billion – and cotton exports \$1.9 billion – greater per year in the absence of goods trade barriers and subsidies.

## **Conclusions**

The message that emerges clearly from this analysis is that the potential gains from global trade reform are non-trivial, including for developing countries, and despite the adverse terms of trade impact it would have on many developing countries. If all current distortions to world trade in merchandise were phased out then, according to these results, by 2015 developing

country production and exports, particularly of agricultural products, would be substantially greater than without such reform. These greater earnings of foreign exchange – potentially an extra \$600 billion per year, \$440 billion for middle-income countries and \$160 billion from low-income countries – could be used to import more goods, as assumed in the above modeling exercise. Alternatively, they could be used to service foreign debt. The greater export earnings are well above total debt service payments, so that would allow countries to also repay some of the principle with those extra foreign exchange earnings if they wished. In 2003, for example, total debt service payments of all developing countries was just under \$90 billion, or just 15 percent of the extra export earnings that a move to global free trade would generate. Even for highly indebted Latin America and for Europe's transition economies the share is less than one-third and one-half, respectively; and for low-income countries it is only 6 percent (Table 12).

To realize those potential gains in welfare and foreign exchange earnings, it is in agriculture that by far the largest cuts in tariffs and subsidies are required. The political sensitivity of farm support programs, coupled with the complexities of the measures introduced in the Uruguay Round Agreement on Agriculture and of the modalities set out in the Doha Framework Agreement of July 2004, make that a daunting task, but one worth pursuing. The WTO's Doha Development Agenda is an obvious vehicle for moving down this path (Anderson and Martin 2005, 2006). Multilateral cuts in tariff bindings are especially helpful because they can lock in previous unilateral trade liberalizations; and they can be used as an opportunity to multilateralize previously agreed preferential trade agreements and thereby reduce the risk of trade diversion from those bilateral or regional arrangements.

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**Table 1(a): Import-weighted average applied tariffs, by sector and region, 2001**  
(percent)

<b>Importing region:</b>	<b>Agriculture and processed food</b>	<b>Other primary products<sup>a</sup></b>	<b>Textiles and clothing</b>	<b>Other manufact- uring</b>	<b>ALL GOODS</b>
<b>High-income countries<sup>b</sup></b>	<b>16.0</b>	<b>1.0</b>	<b>7.5</b>	<b>1.3</b>	<b>2.9</b>
<b>Developing countries</b>	<b>17.7</b>	<b>6.5</b>	<b>17.0</b>	<b>8.3</b>	<b>9.9</b>
<i>Middle-income countries</i>	16.5	4.6	16.8	7.3	8.9
<i>Low-income countries</i>	22.2	14.2	17.9	14.5	15.9
East Asia and Pacific	26.3		17.8	8.6	10.5
South Asia	33.9		20.1	22.2	23.5
Europe & Central Asia	14.8		10.7	4.1	6.0
Middle East & N. Africa	14.1		27.1	7.2	9.8
Sub-Saharan Africa	18.2		23.7	10.5	12.6
Latin America & Carib.	10.3		11.3	7.1	7.7
<b>World total</b>	<b>16.7</b>	<b>5.1</b>	<b>10.2</b>	<b>3.5</b>	<b>5.2</b>

<sup>a</sup> Forestry, fishing, fuels, minerals and non-ferrous metals.

<sup>b</sup> Intra-EU15 trade is ignored in calculating weights for determining tariff averages.

Source: Authors' compilations from the GTAP database Version 6.05

**Table 1(b): Import-weighted average applied tariffs, by sector and country, 2005<sup>b</sup>**  
(percent)

<b>Importing region:</b>	<b>Agriculture and processed food</b>	<b>(Primary agriculture only)</b>	<b>(Processed food only)</b>	<b>Textiles and clothing</b>	<b>Other manufacturing</b>
<b>World</b>	<b>15.2</b>			<b>9.3</b>	<b>3.1</b>
<b><u>High-income</u></b>	<b>15.9</b>			<b>7.3</b>	<b>1.2</b>
Australia & NZ	2.6	0.3	3.3	13.9	4.1
EU25 + EFTA	13.9	13.2	14.7	5.1	1.7
United States	2.4	2.3	2.5	9.6	0.9
Canada	9.0	1.2	14.1	8.7	0.5
Japan	29.3	48.0	20.8	9.0	0.4
S. Korea & Taiwan	53.0	84.5	22.4	9.2	3.6
Hong Kong & Sing.	0.1	0.0	0.2	0.0	0.0
<b><u>Developing countries<sup>b</sup></u></b>	<b>14.2</b>			<b>14.3</b>	<b>7.1</b>
<b><i>Middle-income</i></b>	<b>12.1</b>			<b>13.6</b>	<b>6.0</b>
Argentina	7.1	5.6	7.8	11.1	10.1
Brazil	5.0	2.4	9.0	14.7	9.7
China	10.3	9.9	11.0	9.6	5.5
Mexico	10.3	10.8	9.7	7.8	4.3
Russia	13.5	14.6	12.8	15.8	7.8
South Africa	8.6	5.9	10.6	21.9	5.4
Thailand	16.7	12.7	19.2	16.4	7.6
Turkey	16.6	16.4	17.0	3.8	1.2
Rest of East Asia	13.4	18.6	9.0	8.7	3.5
Rest of LAC	10.8	9.2	11.8	12.9	8.4
Rest of ECA	15.7	10.4	19.5	9.3	3.2
M. East & N. Africa	13.1	8.2	18.3	23.9	7.2
<b><i>Low-income</i></b>	<b>22.0</b>			<b>17.9</b>	<b>14.1</b>
Bangladesh	12.7	7.4	21.2	29.9	16.2
India	49.9	25.7	75.6	26.5	24.2
Indonesia	5.0	4.3	6.2	8.0	4.3
Vietnam	37.1	13.1	44.8	29.1	12.3
Rest of South Asia	21.1	14.2	32.0	6.6	14.3
Selected SSAfrica <sup>a</sup>	11.8	10.2	13.0	12.5	7.5
Rest of SSAfrica	21.2	18.0	23.6	26.2	14.0
Rest of the World	11.8	1.9	18.7	5.6	8.9

<sup>a</sup> The Selected Sub-Saharan African countries (for which national modules are available in the LINKAGE Model) include Botswana, Madagascar, Malawi, Mozambique, Tanzania, Uganda, Zambia, Zimbabwe.

<sup>b</sup> These are the averages at the start of 2005 following EU expansion eastwards in 2004, WTO accession by China, and the phase-out of MFA quotas on textile and clothing trade at end-2004.

Source: Authors' projections from the GTAP database Version 6.05 using the World Bank's LINKAGE model



**Table 2(a): Export Subsidies/taxes by sector and region: weighted average (% of export value), 2001**

(excluding countries that are reported as zeros)

<b>Importing region:</b>	<b>Agric and food</b>	<b>Other primary</b>	<b>Other manuf</b>
<b>High-income countries</b>	<b>2.5</b>	<b>0.0</b>	<b>0.0</b>
<b>Developing countries</b>	<b>0.1</b>	<b>-1.7</b>	<b>-0.8</b>
Australia	0.0	-0.5	-1.1
Canada	0.0	0.0	0.0
EU15	7.7	0.0	0.0
Japan	0.0	0.0	0.0
New Zealand	0.0	-0.6	-0.9
Switzerland	7.3	0.1	0.1
Rest of EFTA	1.2	0.0	0.0
United States	0.1	0.0	0.0
<b>Eastern Central Europe</b>	<b>0.3</b>	<b>-4.6</b>	<b>-0.6</b>
Czech Rep.	2.2	0.0	0.0
Hungary	0.3	0.0	0.0
Poland	0.5	0.0	-0.1
Russia	0.0	-7.6	-3.2
Turkey	0.7	-2.6	-0.6
<b>Asia</b>	<b>0.0</b>	<b>-0.1</b>	<b>-1.2</b>
China	0.0	0.0	-1.6
India	0.0	0.0	-1.6
Indonesia	0.0	0.0	-0.9
Pakistan	0.0	-8.7	-5.9
Philippines	0.0	0.1	-0.2
Sri Lanka	0.0	0.3	-1.3
Thailand	0.0	0.0	-0.5
Vietnam	0.0	-1.2	-5.3
<b>Latin America &amp; Car.</b>	<b>0.0</b>	<b>-0.2</b>	<b>0.0</b>
Argentina	0.0	-0.7	-0.5
Brazil	0.0	-0.4	-0.4
Colombia	0.0	0.1	1.4
Peru	0.0	-1.3	1.9
Uruguay	0.0	0.3	4.3
Venezuela	0.0	-0.4	-0.7
Central America	0.0	0.0	0.6
Rest of South America	0.0	0.2	1.4
Rest of FTAA	0.0	-1.5	-0.4
Rest of the Caribbean	0.0	0.1	0.4
<b>Africa</b>	<b>0.0</b>	<b>-0.2</b>	<b>-0.3</b>
Morocco	0.0	-2.8	-2.6
Nigeria	0.0	-0.4	-8.2
South Africa	0.0	0.5	0.5
Tunisia	0.0	-0.4	0.0
Rest of Sth African CU	0.0	0.8	0.3
Rest of North Africa	0.0	-0.6	-1.0

Source: GTAP Version 6.1 database, available at [www.gtap.org](http://www.gtap.org)

**Table 2(b): Production subsidies (overall domestic support) by sector and region: weighted average (% of value of production), 2001**

(excluding countries that are reported as zeros)

<b>Importing region:</b>	<b>Agric and food</b>	<b>Other primary</b>	<b>Other manuf</b>
<b>High-income countries</b>	<b>3.2</b>	<b>0.0</b>	<b>0.1</b>
<b>Developing countries</b>	<b>0.4</b>	<b>0.0</b>	<b>0.0</b>
Australia	1.2	0.0	0.0
Canada	2.7	0.0	0.0
EU15	3.5	0.0	0.4
Japan	0.4	0.0	0.0
New Zealand	0.1	0.0	0.0
Switzerland	7.1	0.0	0.0
Rest of EFTA	6.0	0.0	0.3
United States	3.3	0.0	0.0
<b>Eastern Central Europe</b>	<b>0.4</b>	<b>0.0</b>	<b>0.0</b>
Czech Rep.	2.4	0.0	0.0
Hungary	4.7	0.0	0.1
Poland	0.5	0.0	0.0
Turkey	1.6	0.0	0.0
<b>Asia</b>	<b>0.5</b>	<b>0.0</b>	<b>0.0</b>
Bangladesh	0.0	0.0	1.7
India	2.6	0.0	0.0
Sri Lanka	0.5	0.1	0.6
<b>Latin America &amp; Car.</b>	<b>0.5</b>	<b>0.1</b>	<b>0.0</b>
Ecuador	0.0	4.8	0.0
Mexico	1.6	0.0	0.0

Source: GTAP Version 6.1 database, available at [www.gtap.org](http://www.gtap.org)

**Table 3: Impacts on economic welfare (real income) of global merchandise trade and subsidy policies, by country/region, 2015**

(Impacts in 2015 relative to the baseline, in 2001 dollars first two columns, percent of baseline income last three columns)

	Cost (\$billion)		Loss as percent of baseline income		
	Total loss (\$billion)	Loss due to change in terms of trade (\$billion)	That due to all merch. trade and subsidy policies (percent)	That due to agriculture & food policies only (percent)	That due to all other merchandise trade policies (percent)
Australia and New Zealand	6.1	3.5	1.04	1.00	0.04
EU 25 plus EFTA	65.2	0.5	0.65	0.38	0.26
United States	16.2	10.7	0.11	0.05	0.07
Canada	3.8	-0.3	0.41	0.63	-0.22
Japan	54.6	7.5	1.10	0.72	0.37
Korea and Taiwan	44.6	0.4	3.52	2.62	0.90
Hong Kong and Singapore	11.2	7.9	2.60	0.46	2.13
Argentina	4.9	1.2	1.15	0.96	0.19
Bangladesh	0.1	-1.1	0.19	0.21	-0.03
Brazil	9.9	4.6	1.52	1.51	0.02
China	5.6	-8.3	0.21	0.05	0.15
India	3.4	-9.4	0.37	-0.25	0.62
Indonesia	1.9	0.2	0.71	0.31	0.41
Thailand	7.7	0.7	3.91	2.09	1.82
Vietnam	3.0	-0.2	5.25	2.49	2.76
Russia	2.7	-2.7	0.54	0.23	0.31
Mexico	3.6	-3.6	0.41	0.22	0.20
South Africa	1.3	0.0	0.87	0.35	0.52
Turkey	3.3	0.2	1.32	0.81	0.51
Rest of South Asia	1.0	-0.8	0.51	0.27	0.23
Rest of East Asia	5.3	-0.9	1.85	1.63	0.22
Rest of LAC	10.3	0.0	1.21	1.24	-0.04
Rest of ECA	1.0	-1.6	0.30	0.67	-0.37
Middle East and North Africa	14.0	-6.4	1.16	0.27	0.89
Selected SSA countries	1.0	0.5	1.53	1.64	-0.11
Rest of Sub Saharan Africa	2.5	-2.3	1.12	0.97	0.15
Rest of the World	3.4	0.1	1.53	1.23	0.30
<b>High-income countries</b>	<b>201.6</b>	<b>30.3</b>	<b>0.62</b>	<b>0.40</b>	<b>0.23</b>
<b>Developing countries</b>	<b>85.7</b>	<b>-29.7</b>	<b>0.83</b>	<b>0.52</b>	<b>0.31</b>
Middle-income countries	69.5	-16.7	0.84	0.56	0.28
Low-income countries	16.2	-12.9	0.81	0.38	0.43
East Asia and Pacific	23.5	-8.5	0.69	0.37	0.32
South Asia	4.5	-11.2	0.38	-0.14	0.52
Europe and Central Asia	7.0	-4.0	0.67	0.51	0.16
Middle East and North Africa	14.0	-6.4	1.16	0.27	0.89
Sub Saharan Africa	4.8	-1.8	1.09	0.85	0.24
Latin America & the Caribbean	28.7	2.2	1.02	0.94	0.08
<b>World total</b>	<b>287.3</b>	<b>0.6</b>	<b>0.67</b>	<b>0.43</b>	<b>0.25</b>

Source: Authors' World Bank LINKAGE model simulations

**Table 4: Regional and sectoral source of costs of global merchandise trade and subsidy policies, developing and high-income countries, 2015**

(Change in real income in 2015 relative to baseline scenario)

	Loss by region in \$billion			Percent of regional loss				
	<i>All devel- oping</i>	<i>All high- income</i>	<i>World</i>	<i>All devel- oping</i>	<i>Middle- income</i>	<i>Sub- Saharan Africa</i>	<i>All high- income</i>	<i>World</i>
<b>Developing countries liberalize:</b>								
<i>Agriculture and food</i>	28	19	47	33	34	35	9	17
<i>Textiles and clothing</i>	9	14	23	10	12	11	7	8
<i>Other merchandise</i>	6	52	58	7	1	14	26	20
<i>All sectors</i>	43	85	128	50	47	60	42	45
<b>High-income countries liberalize:</b>								
<i>Agriculture and food</i>	26	109	135	30	31	43	54	47
<i>Textiles and clothing</i>	13	2	15	15	15	-0	1	5
<i>Other merchandise</i>	4	5	9	5	7	-3	2	3
<i>All sectors</i>	43	116	159	50	53	40	57	55
<b>All countries liberalize:</b>								
<i>Agriculture and food</i>	54	128	182	63	65	78	64	63
<i>Textiles and clothing</i>	22	16	38	25	27	11	8	14
<i>Other merchandise</i>	10	57	67	12	8	11	28	23
<i>All sectors</i>	86	201	287	100	100	100	100	100

<sup>a</sup> Small interaction effects are distributed proportionately and numbers are rounded to sum to 100 percent

Source: Authors' World Bank LINKAGE model simulations

**Table 5: Decomposition of the terms of trade impacts of global merchandise trade and subsidy policies on economic welfare, 2015**

(Real income impacts of terms of trade changes in 2015, \$billion)

	Impact of changes in export prices				Impact of changes in import prices				Sum of all changes in terms of trade
	Agriculture and food	Other merch.	Services	Total	Agriculture and food	Other merch.	Services	Total	
Australia and New Zealand	2.1	0.7	0.5	3.4	-0.1	0.1	0.0	0.1	3.5
EU 25 plus EFTA	1.3	-6.4	-7.3	-12.3	-0.9	12.0	1.7	12.8	0.5
United States	7.2	-4.1	-0.9	2.1	-0.1	8.4	0.3	8.6	10.7
Canada	1.0	-1.8	-0.2	-1.0	-0.5	1.1	0.1	0.7	-0.3
Japan	-0.4	5.4	0.6	5.6	0.2	1.4	0.2	1.9	7.5
Korea and Taiwan	-5.8	4.8	1.4	0.5	-0.9	0.8	0.1	0.0	0.4
Hong Kong and Singapore	0.1	4.0	3.4	7.5	-0.1	0.2	0.2	0.3	7.9
Argentina	0.8	0.3	0.0	1.2	-0.1	0.0	0.0	0.0	1.2
Bangladesh	-0.1	-0.8	-0.2	-1.1	-0.1	0.1	0.0	0.0	-1.1
Brazil	2.7	1.0	0.5	4.2	-0.1	0.5	0.1	0.4	4.6
China	0.0	-2.9	0.3	-2.7	-3.9	-1.1	-0.6	-5.6	-8.3
India	-0.5	-7.7	-1.4	-9.7	-0.3	0.7	0.0	0.3	-9.4
Indonesia	0.2	0.4	0.1	0.8	-0.4	-0.2	0.0	-0.6	0.2
Thailand	0.5	-0.7	0.7	0.5	0.0	0.2	0.0	0.2	0.7
Vietnam	0.3	-0.9	0.3	-0.2	-0.1	0.1	0.1	0.0	-0.2
Russia	-0.2	-2.7	-0.2	-3.2	-0.4	0.8	0.1	0.5	-2.7
Mexico	0.6	-3.8	-0.2	-3.4	-0.9	0.6	0.1	-0.3	-3.6
South Africa	0.0	-0.1	0.0	-0.2	-0.1	0.2	0.0	0.2	0.0
Turkey	0.0	-0.2	0.2	0.0	-0.3	0.5	0.0	0.2	0.2
Rest of South Asia	0.0	-0.8	-0.2	-1.0	-0.1	0.3	0.0	0.2	-0.8
Rest of East Asia	0.1	-0.8	0.8	0.1	-0.5	-0.6	0.1	-1.0	-0.9
Rest of LAC	1.5	-1.6	0.0	-0.1	-0.7	0.7	0.1	0.1	0.0
Rest of ECA	-0.4	-2.5	-0.6	-3.5	0.3	1.4	0.1	1.9	-1.6
Middle East and North Africa	-0.3	-6.7	-0.4	-7.4	-1.5	2.3	0.2	1.0	-6.4
Selected SSA countries	0.2	0.0	0.0	0.3	0.0	0.2	0.0	0.2	0.5
Rest of Sub Saharan Africa	-0.4	-2.2	-0.4	-2.9	0.0	0.6	0.0	0.7	-2.3
Rest of the World	0.0	-0.1	0.0	-0.1	0.2	0.1	0.0	0.3	0.1
<b>High-income countries</b>	<b>5.7</b>	<b>2.7</b>	<b>-2.5</b>	<b>5.9</b>	<b>-2.4</b>	<b>24.0</b>	<b>2.8</b>	<b>24.4</b>	<b>30.3</b>
<b>Developing countries</b>	<b>5.0</b>	<b>-32.9</b>	<b>-0.5</b>	<b>-28.4</b>	<b>-9.0</b>	<b>7.5</b>	<b>0.3</b>	<b>-1.3</b>	<b>-29.7</b>
Middle-income countries	5.2	-20.7	1.1	-14.4	-8.1	5.6	0.1	-2.4	-16.7
Low-income countries	-0.2	-12.2	-1.6	-14.0	-0.9	1.8	0.1	1.1	-12.9
East Asia and Pacific	1.1	-4.9	2.2	-1.6	-4.8	-1.7	-0.4	-6.9	-8.5
South Asia	-0.6	-9.4	-1.7	-11.8	-0.6	1.1	0.0	0.6	-11.2
Europe and Central Asia	-0.6	-5.4	-0.7	-6.7	-0.5	2.8	0.3	2.6	-4.0
Middle East and North Africa	-0.3	-6.7	-0.4	-7.4	-1.5	2.3	0.2	1.0	-6.4
Sub Saharan Africa	-0.2	-2.3	-0.3	-2.8	-0.1	1.0	0.1	1.0	-1.8
Latin America & the Caribbean	5.5	-4.0	0.4	1.9	-1.8	1.8	0.2	0.2	2.2
<b>World total</b>	<b>10.7</b>	<b>-30.1</b>	<b>-3.0</b>	<b>-22.4</b>	<b>-11.4</b>	<b>31.4</b>	<b>3.0</b>	<b>23.1</b>	<b>0.6</b>

Source: Authors' World Bank LINKAGE model simulations

**Table 6: Impact of global merchandise trade and subsidy policies on developing countries' shares of world output and exports, by sector, 2015**

(percent, in constant prices)

	<b>Primary agriculture</b>	<b>Processed food, beverages and tobacco</b>	<b>Textiles and clothing</b>	<b>Other manufacturing</b>	<b>ALL MERCH- ANDISE</b>
<b>Output</b>					
— baseline	70	40	62	35	40
— free trade	75	40	65	35	41
<b>Exports<sup>a</sup></b>					
— baseline	47	34	63	30	34
— free trade	62	40	67	32	37

<sup>a</sup> Including intra-EU trade

Source: Authors' World Bank LINKAGE model simulations

**Table 7: Export impacts of global merchandise trade and subsidy policies, 2015**

(Loss in \$billion relative to the baseline in 2015, FOB prices)

	Agriculture and food	Non-agric primary	Other manufac- turing	Services	Total
Australia and New Zealand	18.0	-0.4	-0.2	-1.8	15.6
EU 25 plus EFTA	21.7	7.2	171.7	19.1	219.7
United States	18.4	0.8	57.6	2.7	79.5
Canada	14.6	-0.9	-6.4	0.7	7.9
Japan	2.8	0.3	65.9	-1.8	67.2
Korea and Taiwan	33.2	10.8	44.1	-4.7	83.4
Hong Kong and Singapore	7.0	-14.2	9.3	-9.6	-7.5
Argentina	10.4	0.1	-0.2	-0.1	10.1
Bangladesh	0.8	0.0	4.7	0.5	6.0
Brazil	38.1	-0.5	-0.4	-1.7	35.5
China	15.0	0.5	142.9	-1.1	157.4
India	5.1	1.6	56.6	4.5	67.8
Indonesia	3.6	-1.8	11.9	-0.4	13.4
Thailand	5.6	-0.6	30.0	-2.3	32.7
Vietnam	1.2	-0.3	19.5	-1.0	19.5
Russia	0.7	1.4	14.4	0.7	17.3
Mexico	11.9	0.0	17.1	0.6	29.6
South Africa	2.4	0.5	4.9	0.0	7.7
Turkey	4.3	0.1	5.3	-0.7	8.9
Rest of South Asia	2.9	0.4	7.9	0.5	11.7
Rest of East Asia	9.4	-1.7	16.3	-2.5	21.5
Rest of LAC	35.9	1.6	5.3	-0.1	42.7
Rest of ECA	9.2	1.2	8.5	1.8	20.7
Middle East and North Africa	13.2	20.0	27.0	1.2	61.5
Selected SSA countries	4.5	0.0	-0.9	-0.1	3.4
Rest of Sub Saharan Africa	9.5	5.6	6.2	1.2	22.4
Rest of the World	8.2	0.1	5.6	0.0	13.9
<b>High-income countries</b>	<b>115.8</b>	<b>3.5</b>	<b>341.9</b>	<b>4.4</b>	<b>465.7</b>
<b>Developing countries</b>	<b>191.9</b>	<b>28.2</b>	<b>382.5</b>	<b>1.0</b>	<b>603.7</b>
Middle-income countries	156.0	22.6	271.0	-4.2	445.5
Low-income countries	35.9	5.6	111.5	5.2	158.1
East Asia and Pacific	34.8	-3.7	220.6	-7.3	244.5
South Asia	8.8	2.0	69.2	5.6	85.6
Europe and Central Asia	14.1	2.7	28.2	1.9	46.9
Middle East and North Africa	13.2	20.0	27.0	1.2	61.5
Sub Saharan Africa	16.4	6.0	10.2	1.0	33.6
Latin America and the Caribbean	96.3	1.2	21.7	-1.4	117.8
<b>World total</b>	<b>307.7</b>	<b>31.8</b>	<b>724.4</b>	<b>5.4</b>	<b>1069.4</b>

Source: Authors' World Bank LINKAGE model simulations

**Table 8: Import impacts of global merchandise trade and subsidy policies, 2015<sup>a</sup>**

(Loss in \$billion relative to the baseline in 2015, FOB prices)

	Agriculture and food	Non-agric primary	Other manufacturing	Services	Total
Australia and New Zealand	1.4	0.7	11.9	1.4	15.4
EU 25 plus EFTA	103.5	3.9	142.2	-13.3	236.3
United States	16.5	1.8	62.3	-1.2	79.4
Canada	6.9	0.0	1.7	-0.3	8.3
Japan	34.7	2.4	28.1	3.6	68.7
Korea and Taiwan	12.3	10.8	52.7	7.3	83.1
Hong Kong and Singapore	1.5	-13.5	4.3	3.5	-4.3
Argentina	0.7	0.1	8.7	0.3	9.8
Bangladesh	0.4	0.3	5.1	-0.2	5.6
Brazil	2.8	0.9	28.6	2.1	34.4
China	24.1	5.3	122.1	0.5	152.0
India	13.4	5.9	47.4	-2.1	64.5
Indonesia	1.9	0.3	9.9	0.8	12.9
Thailand	5.2	0.6	24.4	1.3	31.6
Vietnam	3.3	0.6	11.6	3.3	18.7
Russia	4.4	0.4	13.1	-0.9	17.0
Mexico	6.7	0.5	20.7	-0.3	27.7
South Africa	1.1	0.2	6.2	0.0	7.4
Turkey	4.3	0.3	3.9	0.3	8.9
Rest of South Asia	3.7	1.3	6.4	-0.2	11.2
Rest of East Asia	5.8	0.0	14.0	1.1	20.9
Rest of LAC	9.6	2.0	29.6	0.2	41.3
Rest of ECA	10.9	0.3	10.2	-0.6	20.9
Middle East and North Africa	17.5	3.9	38.8	-0.5	59.8
Selected SSA countries	1.3	0.1	1.7	0.1	3.3
Rest of Sub Saharan Africa	8.1	2.5	11.3	-0.8	21.1
Rest of the World	5.8	0.1	7.5	0.0	13.4
<b>High-income countries</b>	<b>176.7</b>	<b>6.0</b>	<b>303.2</b>	<b>1.0</b>	<b>486.9</b>
<b>Developing countries</b>	<b>131.0</b>	<b>25.8</b>	<b>421.3</b>	<b>4.4</b>	<b>582.5</b>
Middle-income countries	93.1	14.7	320.4	3.6	431.7
Low-income countries	37.9	11.1	100.9	0.9	150.8
East Asia and Pacific	40.4	6.9	181.9	7.0	236.2
South Asia	17.5	7.5	58.9	-2.5	81.3
Europe and Central Asia	19.6	1.1	27.3	-1.2	46.7
Middle East and North Africa	17.5	3.9	38.8	-0.5	59.8
Sub Saharan Africa	10.5	2.8	19.2	-0.7	31.8
Latin America and the Caribbean	19.8	3.5	87.6	2.2	113.1
<b>World total</b>	<b>307.7</b>	<b>31.8</b>	<b>724.4</b>	<b>5.4</b>	<b>1069.4</b>

Note: a) The balance of trade between high-income and developing regions is equal to the net (exogenous) foreign saving between the two regions and the balance of trade in international trade and transport services. The former is the same in the baseline and the shock. The latter can vary with these services being allocated to the most competitive countries (within an overall CES demand structure). Hence, the change in high-income countries' exports \$466 billion is not equal to the change in its imports \$487 billion, with the difference equal to the change in the net supply of international trade and transport services.

Source: Authors' World Bank LINKAGE model simulations



**Table 9: Impact of global merchandise trade and subsidy policies on self sufficiency<sup>a</sup> in agricultural and other products, selected regions, 2015**

	High-income countries		Developing countries		Sub-Saharan Africa		Latin America & Caribbean		South Asia		China	
	<i>Baseline</i>	<i>Global lib'n</i>	<i>Baseline</i>	<i>Global lib'n</i>	<i>Baseline</i>	<i>Global lib'n</i>	<i>Baseline</i>	<i>Global lib'n</i>	<i>Baseline</i>	<i>Global lib'n</i>	<i>Baseline</i>	<i>Global lib'n</i>
Rice	101	78	100	103	92	82	99	99	102	103	100	108
Wheat	160	140	91	94	55	39	92	127	99	98	92	93
Coarse grains	119	134	93	88	101	102	107	109	99	99	89	42
Oilseeds	135	79	90	106	158	278	188	249	100	102	3	3
Sugar	97	66	102	115	110	120	126	173	100	100	56	35
Cotton	121	84	96	103	389	698	95	107	89	92	94	96
Fruit and vegetables	89	80	103	105	139	144	147	185	97	91	98	98
Other crops	86	87	112	111	168	176	142	134	105	106	19	17
Livestock	104	104	98	98	103	103	103	102	99	99	96	95
Fossil fuels	81	80	124	125	152	160	119	118	71	61	88	85
Other natural resources	94	94	104	104	126	127	129	129	97	97	93	93
Processed meats	101	93	99	111	97	139	105	134	108	117	91	88
Vegetable oils and fats	98	91	102	108	89	76	113	107	77	34	96	91
Dairy products	104	103	90	94	78	79	95	96	97	98	66	61
Other food, beverages & tob.	98	101	102	99	102	96	108	108	112	110	99	98
Textiles	97	98	102	101	81	68	89	83	132	137	102	101
Wearing apparel	68	61	162	176	89	73	95	84	527	792	228	260
Leather products	60	56	139	144	92	66	110	92	173	191	158	167
Chemicals, rubber & plastics	105	106	92	91	75	71	82	77	95	94	94	91
Iron and steel	101	101	99	98	106	107	102	95	98	95	94	93
Motor vehicles and parts	103	104	91	87	66	76	105	105	97	89	92	82
Capital goods	103	103	95	95	48	47	86	83	82	82	105	106
Other manufacturing	96	97	107	106	121	116	100	95	101	98	112	113
Agriculture and food	100	98	100	102	109	113	112	122	100	98	95	94
Agriculture	101	94	100	102	119	125	122	136	100	99	94	93
Processed foods	99	99	101	101	100	100	106	113	103	95	97	96
Textiles and wearing apparel	79	76	118	121	84	69	95	85	151	166	128	132
Other manufacturing	99	100	101	100	98	98	96	92	92	89	102	102

<sup>a</sup> Self sufficiency is defined as domestic production as a percentage of domestic consumption measured in value terms at fob prices.

Source: Authors' World Bank LINKAGE model simulations

**Table 10: Impact of global merchandise trade and subsidy policies on shares of global output exported and the developing country shares of global output and exports,<sup>a</sup> by product, 2015**  
(percent)

	Share of global output exported <sup>a</sup>		Developing countries' share of global output		Developing countries' share of global exports <sup>a</sup>	
	Baseline	Full lib'n	Baseline	Full lib'n	Baseline	Full lib'n
Rice	3	9	78	91	68	70
Wheat	13	18	79	82	21	42
Coarse grains	12	22	69	65	26	31
Oilseeds	31	37	70	82	49	83
Sugar	6	20	62	80	79	88
Cotton	18	18	82	86	55	82
Fruit and vegetables	7	12	83	85	70	74
Other crops	17	20	61	60	76	73
Livestock	3	4	69	70	27	29
Fossil fuels	29	30	55	55	69	70
Other primary	11	11	65	64	68	69
Processed meats	7	15	38	43	37	55
Vegetable oils and fats	10	20	52	56	79	80
Dairy products	6	11	26	28	21	28
Other food, beverages and tobacco	7	11	43	41	52	43
Textiles	22	29	65	66	55	55
Wearing apparel	34	43	55	61	81	84
Leather	37	47	71	73	76	75
Chemicals, rubber and plastics	19	22	35	34	30	34
Iron and steel	13	15	43	42	51	51
Motor vehicles and parts	23	28	21	19	19	22
Capital goods	38	40	31	31	32	34
Other manufacturing	14	16	37	36	50	49
<b>All agriculture and food</b>	<b>7</b>	<b>12</b>	<b>54</b>	<b>56</b>	<b>51</b>	<b>55</b>
Agriculture	8	12	73	77	54	65
Processed foods	7	12	40	41	49	48
Textiles and wearing apparel	28	35	63	65	69	69
Other manufacturing	24	26	36	36	38	39
<b>All merchandise</b>	<b>20</b>	<b>24</b>	<b>42</b>	<b>42</b>	<b>42</b>	<b>44</b>

<sup>a</sup>excluding intra-EU trade.

Source: Authors' World Bank LINKAGE model simulations

**Table 11: Impact of full global liberalization on output, value added and exports of cotton,<sup>a</sup> by region, 2015**

	<b>Share of production exported</b>		<b>Change in cotton output</b>	<b>Change in value added in cotton production</b>	<b>Change in cotton export value<sup>b</sup></b>
	<b>(percent)</b>		<b>(\$billion)</b>	<b>(\$billion)</b>	<b>(\$billion)</b>
	<b>Base line</b>	<b>Full lib'n</b>			
United States	38	4	-4.7	-2.8	-3.5
EU 25 plus EFTA	72	70	-1.4	-0.5	-1
Other high-income	66	69	1	0.4	0.9
Sub-Saharan Africa	78	88	2.2	1.1	1.9
Latin America	24	29	1.2	0.6	0.7
Other developing	6	9	1.8	0.4	1.6
<b>World total</b>	<b>18</b>	<b>18</b>	<b>0.1</b>	<b>-0.7</b>	<b>0.6</b>

<sup>a</sup> Actually all plant-based fibers, but cotton is more than 95 percent of that sector. These results assume subsidies and import tariffs on all merchandise (not just on cotton) are removed.

<sup>b</sup> Including intra-EU trade

Source: Authors' World Bank LINKAGE model simulations

**Table 12: Debt service in 2003 relative to export impact of trade policies**

(\$billion)

	Debt service <sup>a</sup>	Export impact	Debt service as % of export impact
Argentina	1.3	10.1	13
Bangladesh	0.2	6.0	3
Brazil	13.6	35.5	38
China	4.6	157.4	3
India	5.9	67.8	9
Indonesia	3.4	13.4	25
Thailand	1.7	32.7	5
Vietnam	0.3	19.5	2
Russia	7.5	17.3	43
Mexico	10.3	29.6	35
South Africa	1.1	7.7	14
Turkey	5.2	8.9	58
Rest of South Asia	1.2	11.7	10
Rest of East Asia	11.5	21.5	53
Rest of LAC	21.2	42.7	50
Rest of ECA	14.4	20.7	70
Middle East and North Africa	5.5	61.5	9
Rest of Sub Saharan Africa	2.0	25.8	8
<b>All developing countries</b>	<b>88.5</b>	<b>603.7</b>	<b>15</b>
Middle-income countries	75.9	445.5	17
Low-income countries	9.4	158.1	6
East Asia and Pacific	14.7	244.5	6
South Asia	7.1	85.6	8
Europe and Central Asia	21.9	46.9	47
Middle East and North Africa	5.5	61.5	9
Sub Saharan Africa	3.1	33.6	9
Latin America and the Caribbean	36.1	117.8	31

<sup>a</sup> Public and publicly guaranteed interest payments*Source:* Authors' World Bank LINKAGE model simulations and World Bank (2005)

**Appendix Table A: Model aggregation of regions and sectors**

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<b>Regions</b>	<b>Sectors</b>
<b>High-income</b>	<b>Primary agriculture</b>
Australia and New Zealand	Rice
EU 25 plus EFTA	Wheat
United States	Other grains
Canada	Oil seeds
Japan	Sugar
Korea and Taiwan	Plant-based fibers
Hong Kong and Singapore	Vegetables and fruits
	Other crops
	Livestock
<b>Developing countries</b>	<b>Processed foods</b>
Argentina	Processed meats
Bangladesh	Vegetable oils and fats
Brazil	Dairy products
China	Other food, beverages and tobacco
India	
Indonesia	
Thailand	
Vietnam	
Russia	
Mexico	
South Africa	
Turkey	
<b>Developing regions</b>	<b>Textile, clothing and footwear</b>
Rest of South Asia	Textile
Rest of East Asia	Wearing apparel
Rest of LAC	Leather
Rest of ECA	
Middle East and North Africa	
Selected SSA countries	
Rest of Sub Saharan Africa	
Rest of the World	
<b>Output aggregations</b>	<b>Natural resources and other manufacturing</b>
High-income countries	Other natural resources
Other high-income countries (NIEs)	Fossil fuels
Developing countries	Chemicals rubber and plastics
Middle-income countries	Iron and steel
Low-income countries	Motor vehicles and parts
East Asia and Pacific	Capital goods
South Asia	Other manufacturing
Europe and Central Asia	
Middle East and North Africa	
Sub Saharan Africa	
Latin America and the Caribbean	
World total	

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