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# Production-weighted Estimates of Aggregate Protection in Rich Countries toward Developing Countries

By David Roodman

**Abstract**

A challenge in the development of aggregate indexes of trade protection is finding weights to put on various tariffs that a) reflect their importance to exporters and b) are not endogenous to the protection being measured. One common basis for weights is actual imports; but these, as is well-known, are endogenous. Various authors have worked to correct this endogeneity, but doing so is difficult in product areas where protection is both high and widespread. For this reason, I develop a new set of estimates of overall protection in rich countries with respect to developing ones that eschews import weights as much as possible in favor of weights based on the value of exporter's total production in each product area. The results are generally much higher than those from the Bouët et al. (2004) "MAcMap" data set; there, weights are based on imports of large reference groups of countries. I conclude that product areas in which protection is high and wide-spread are systematically de-emphasized when using pure MAcMap weights to aggregate across major product groups. In particular, when gauging rich-country protection with respect to developing countries, agriculture is de-emphasized. I also develop estimates of trade-distorting subsidies by country and commodity and translate these into tariff-equivalents with the methodology of Cline (2004) in order to estimate overall protection levels. Agricultural tariffs dominate subsidies in trade-distorting effect, and agricultural protection in turn dominates goods protection generally. Japan is most protective, largely because of rice tariffs near 900%, followed by Norway and Switzerland. Because of their greater reliance on agriculture, the poorest countries face higher trade barriers than wealthier developing countries, despite tariff preferences.

# Production-weighted Estimates of Aggregate Protection in Rich Countries toward Developing Countries

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**Abstract.** A challenge in the development of aggregate indexes of trade protection is weighting individual tariffs in ways that a) reflect their importance and b) are not endogenous to the protection being measured. The most obvious basis for weights is actual imports; but these may be highly endogenous. Various authors have worked to correct this endogeneity. For example, in the Bouët et al. (2004) "MAcMap" data set, weights are based on imports of reference groups of countries. But eliminating the endogeneity is difficult in product areas where protection is high and widespread. I develop a new set of estimates of overall protection in rich countries with respect to developing ones that eschews import weights as much as possible in favor of weights based on the value of exporter's total production. The results are generally higher than those of Bouët et al. Product areas in which protection is high and widespread seem systematically de-emphasized when using MAcMap weights, especially in agriculture. I also estimate tariff equivalents of trade-distorting subsidies by country and commodity. Agricultural tariffs dominate subsidies in trade-distorting effect, and agricultural protection in turn dominates goods protection generally. Japan is most protective, largely because of rice tariffs near 900%, followed by Norway and Switzerland. Because of their greater reliance on agriculture, the poorest countries face the highest barriers, despite tariff preferences.

**Keywords:** Agricultural subsidies, tariffs, aggregate protection, Doha Round

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Rich-country trade barriers to the exports of poor countries have been a high-profile issue in the current, struggling negotiations to revise the General Agreement on Tariffs and Trade. The substrates upon which trade negotiators work are the thousand-line tariff schedules maintained by their customs authorities, along with complicated non-tariff barriers including quotas and subsidies. But among both negotiators and interested observers, there has long been an interest in aggregate measures of protection. Which product groups have the highest barriers? Which countries face the highest protection and which impose it? Those who observe and influence the negotiations, including politicians, non-governmental groups, and journalists, seek the big picture. For negotiators, the interest arises in part out of the search for reciprocating cross-sector deals, which create a need to compare, say, France's agricultural protection with Brazil's steel protection (Cooper 1966).

The need for the big picture has long led economists to developed aggregate indexes of protection, usually expressed in *ad valorem* tariff-equivalent terms (Corden 1966; Cooper 1966; Basevi 1971; Anderson and Neary 1994, 1996, 2003; OECD 1997; Bouët et al. 2004; Cline 2002, 2004; IMF 2005; Kee, Nicita, and Olarreaga 2004, 2006). The approaches can be classified in various ways. Some are expedient, others more theoretically sound. Some are partial equilibrium, some general. Different indexes also mean different things and answer different questions. For example, the interest in the domestic implications of a country's own trade policies has often led to weighting of border measures by the value of domestic production in each sector (Basevi 1971).

Here, however, motivated by the recent controversy, we are interested in how a country's barriers affect other countries, in particular, how each rich country's barriers affect poor ones as a group.[2] The ap-

[2] This work is part of the Commitment to Development Index (Roodman 2006a), which rates the "development friendliness" of rich countries in trade and other policy areas.

proach we take is simpler than that of Kee, Nicita, and Olarreaga, who run thousands of regressions in order to estimate 315,451 distinct import elasticities in various countries (as one step in their calculation). Taking a weighted average of individual barriers, the approach is akin to that of Bouët et al. (2004). But it incorporates agricultural subsidies, and avoids what appears to be a problem of endogeneity in their weights.

The challenges in developing aggregate measures of trade policy are well known. The raw data on tariffs and other barriers are complex and often incomplete. Tariff line divisions below the 6-digit level vary by country. It is hard to estimate key parameters, such as supply and demand elasticities, that determine welfare cost of various barriers. But without an understanding of the costs, it is hard to know, for example, whether a tariff twice as high is twice as bad. There are theoretical challenges in comparing barriers, such as tariffs and quotas, that are fundamentally different.

In addition, there is the challenge of weighting. Tariffs against major goods obviously matter more than those against obscure ones, and so ought to be given more weight. But what should be the basis for weights? One natural choice is the value of imports of the good in question, especially tempting since imports data are often available at the same resolution as tariff data. But this leads to an old endogeneity problem: categories with the most protection can get the least weight.[3] Attempts have been made to estimate counterfactual import levels in the absence of protection. Cline, for example, computes "adjusted import weights" for broad sectors such as agriculture based on certain assumptions about the elasticity of demand and supply for imports. Bouët et al. use observed import levels of large reference groups of countries, which are less endogenous to protection in any one country. But neither approach is reliable in

[3] This is not automatically so. To the extent that the political economy of protection causes barriers to be higher for goods with high imports, observed imports and protection will be *positively* correlated (Corden 1996; Cline 2002). But if this effect dominates, import weighting is still be biased, just in the opposite way.

product areas where protection is both high and widespread, as it is in agriculture, textiles, and apparel, the areas of most concern to developing countries. When protection is very high, extrapolated estimates of imports in the absence of protection become too heroic; when it is widespread, reference groups do not work.

This paper eschews import weights as much as possible in favor of weights based on exporter's production—a choice that reflects our interest in the impact of protection on exporters. The value of Vietnam's rice output, for example, is taken as the best available indicator of its propensity to export rice to Japan—better than its actual exports to Japan, however adjusted, and better than its exports to other countries, where it also faces barriers. This system is similar to that of the OECD (1997), with the crucial difference that it substitutes exporter's for importer's production. The underlying protection data come from Bouët et al.'s detailed MAcMap data set, while the data for production weights come from the Global Trade Analysis Project version 6 database. Section 1 details the methodology and uses it to measure protection in individual rich countries with respect to developing countries as a group, by which I mean essentially all countries that are not members of the Development Assistance Committee (DAC). Section 2 integrates estimates of the tariff equivalent of agricultural subsidies, derived with the methodology of Cline (2002, 2004), in order to calculate overall levels of protection in rich countries from the developing country point of view, in agriculture specifically and goods generally. Section 3 briefly concludes.

**1. Aggregate tariff barriers**

Antoine Bouët, Lionel Fontagné, and colleagues at the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) and the International Trade Centre make a formidable attack on the protection-

measurement problem at the tariff line level in their Market Access Map (MAcMap) data set. One sign of the value of their work is that the Global Trade Analysis Project (GTAP) switched to MAcMap data in version 6 of the GTAP modeling product. MAcMap provides *ad valorem* tariff equivalents of tariffs by importer, exporter, and 6-digit line in the Harmonized System of product classification (HS 6). The data set has some 35 million rows in all. The MAcMap data also factor in preferences for least developed countries. And they embody considerable effort on methodologies for converting tariff-rate quotas (TRQs) and specific-unit tariffs into *ad valorem*–equivalent simple tariffs. TRQs, which rich countries apply primarily in agriculture, are pairs of tariffs: a low one applies to imports within some quota, and a high one applies beyond. They originated in Uruguay Round commitments to "tarify" what were once quotas. Specific-unit tariffs, including those in TRQs, are ones expressed in physical terms such as per ton or head of cattle. Finally, the MAcMap data contain a fresh approach to reducing the endogeneity of import weights, which involves clustering importers into reference groups. The weight for a given barrier is based on imports not just of the country imposing the barrier but of all countries in its group. The weights, like the tariff estimates, are provided for each combination of importer, exporter, and HS 6 line.

However, some aggregate results from MAcMap differ surprisingly from previous results. In particular, trade barriers in rich countries with respect to poorer countries appear quite low. (See Table 1.) Seemingly, despite all the Doha Round controversy, rich-country tariffs are a minor problem for developing countries. And to the extent they are a problem, Australia appears to be the greatest offender, rather than Japan, Norway, or Switzerland, the rich countries usually seen as most protective. These results differ substantially from those in Cline (2004) and Kee, Nicita, and Olarreaga (2006).

**Table 1. *Ad valorem* equivalent of trade barriers with respect to middle-income and least-developed country exporters, 2001 (%)**

| Importer | Middle-income exporters | LDC exporters |
|---|---|---|
| Australia | 5.6 | 8.4 |
| Canada | 3.1 | 6.3 |
| EU-15 | 2.7 | 0.8 |
| Japan | 4.1 | 2.0 |
| New Zealand | 2.8 | 4.0 |
| Switzerland | 3.5 | 0.6 |
| United States | 2.6 | 5.9 |

Source: Bouët et al. (2004).

Motivated by the need to update and refine the trade component of the Commitment to Development Index for 2005 (Roodman 2006a), I obtained the MAcMap data set and explored alternative aggregation approaches. The goal was to take advantage of the MAcMap authors' careful work at the sub–HS 6 level while investigating and correcting potential endogeneity problems that would explain results like those in Table 1. The main concern is that MAcMap's use of reference groups still produces import weights that are substantially endogenous. In particular, agricultural protection, which turns out to drive overall results, is high in most rich countries.

To reduce the endogeneity, I experiment with what can be thought of as four distinct changes to the MAcMap aggregation. The thrust throughout is to base weights on the value of exporter's production rather than exports. But production figures are not available at the high resolution of HS 6. The best available data appear to be from the GTAP 6.0 database; there one can find the value of world production of goods and services broken down by 87 country/regions and 57 product groups.[4] Taking advantage of this data for weighting therefore requires that the MAcMap data be aggregated in two steps: first

[4] The 57 include services, which are not relevant here because MAcMap, like all such databases, lacks information on protection in services.

to the GTAP level, then to the universal level. This must be done along each of two dimensions: product groups and exporters. Thus there are four aggregation steps, and in each step I experiment with one change:

1) To aggregate across HS 6 lines within GTAP product categories, I use MAcMap weights or simple averaging—whichever gives the higher number. This increases the sensitivity to the phenomenon of high barriers across an entire reference group of importers for a given product.
2) To aggregate across countries within a GTAP region, I weight by exchange-rate GDP rather than MAcMap weights. This is relevant only for GTAP regions that in fact consist of more than one country, such as "Rest of Sub-Saharan Africa." GDP is a coarse indicator of propensity to export, but has the advantage of not being very endogenous to protection faced, and does distinguish appropriately between large and small countries.
3) To aggregate across GTAP regions, to the full universe of non-DAC countries, I weight by the value of exporter's production in the product category.
4) To aggregate across GTAP product groups to the full universe of traded goods, I weight in the same manner.

These steps reduce but do not eliminate endogeneity. Production too is endogenous to protection faced; even GDP is to some extent. Moreover, the partial reliance on MAcMap weighting within GTAP product categories (change 1) also means that imports still enter.

To investigate the relative significance of these changes, I perform six variants of the original MAcMap aggregation—the aggregation, that is, that relies purely on MAcMap's distinctive reference group import weights. Variant 1 makes changes 1 and 2—and performs the modified steps in that order—but uses

MAcMap weights thereafter, in order to determine the importance of changing how data are aggregated up to the GTAP level. Variant 2 makes changes 1–3 while Variant 3 makes only change 4 because, it will emerge, change 4 is the one of central importance. Variant 4 makes all the changes. Variant 5 makes all changes too, but swaps the first two steps. If all the steps simply took weighted averages, this swap would have no effect. But because change 1 involves the maximum operator, order matters.

Finally, Variant 6 drops change 1 but implements the other changes, and is my preferred variant; the maximum operator in change 1 is relatively atheoretical and turns out to have a small effect on the absolute results and almost no effect on the relative results. Thus Variant 6 is a true weighted average of MAcMap values. It still aggregates across HS 6 lines within GTAP product groups using MAcMap weights, but aggregates across exporters within GTAP country/regions by exporter's GDP and across GTAP product groups and country/regions by the value of exporter's production. Table 2 has the results.

**Table 2. Protection with respect to non-DAC countries, 2001, various aggregation systems (*ad valorem* equivalent, %)**

| | | Variant | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Country | With MAcMap weighting | 1 | 2 | 3 | 4 | 5 | 6 | Variant 6 + export tax equivalents of textile & apparel quotas |
| Australia | 5.44 | 5.71 | 5.62 | 4.36 | 4.73 | 4.49 | 4.36 | 4.36 |
| Canada | 3.04 | 3.33 | 3.21 | 4.23 | 4.51 | 4.39 | 3.93 | 4.77 |
| EU-15 | 2.66 | 3.06 | 2.96 | 8.19 | 8.42 | 8.86 | 7.46 | 9.13 |
| Japan | 3.48 | 4.25 | 4.21 | 25.76 | 29.48 | 28.32 | 26.90 | 26.90 |
| New Zealand | 2.64 | 2.99 | 2.97 | 2.31 | 3.03 | 2.77 | 2.55 | 2.55 |
| Norway | 3.45 | 4.67 | 4.76 | 16.77 | 19.99 | 19.50 | 16.83 | 16.83 |
| Switzerland | 4.11 | 5.30 | 4.80 | 11.25 | 13.27 | 12.97 | 11.00 | 11.00 |
| United States | 2.35 | 2.68 | 2.81 | 2.61 | 3.24 | 2.96 | 2.83 | 4.08 |

It is apparent that change 4—weighting across GTAP product groups by exporter's production rather than MAcMap import weights—makes the biggest difference. To see this, note that the variants break into two groups going by results. Variants 1 and 2 do not make change 4 and yield results similar to the

MAcMap original. Variants 3–5 include change 4 (indeed, it is the only change they all share) and produce similar and generally higher values. This suggests that product areas in which protection is high and widespread in rich countries are systematically de-emphasized when using pure MAcMap weights. It also goes a long way to explaining the difference between the MAcMap aggregates in Table 1 and those in, for example, Cline (2002, 2004).

The detailed appendix Table A–1 further illuminates the key difference. It has one row for each rich-country importer and GTAP product group. The "tariffs" column shows the estimated tariff level by importer and product group, as used in the preferred Variant 6—tariff levels derived, that is, by aggregating across HS 6 lines to GTAP product categories by MAcMap weight, and across countries to GTAP regions by GDP. The next column shows the MAcMap weights for each importer–product group combination. The one after shows weights based on exporters' production. Both weight sets are adjusted to sum to 100% for each importer. (The next section explains the final two columns.) In agricultural categories, most exporter's production weights are much higher than MAcMap weights. For example, the EU's estimated 90% tariff on sugar from non-DAC countries gets only 0.15% weight in the MAcMap system but 0.76% going by exporter's production, a 5-fold difference. By the same token, MAcMap gives more weight to manufactures, where rich-country protection is generally low—but where Australian protection is relatively high. This explains the poor relative result for Australia in the pure MAcMap approach.

Given the high protection levels throughout the group of rich countries in certain categories, especially agriculture, it seems likely that the MAcMap reference-group system, *when used for aggregation across major product categories,* leads to substantial underestimates of protection. A similar endogeneity bias

may also operate within product groups, but the similarity of results between Variants 5 and 6 (which differ only in whether they use the simple average as a floor for the MacMAp-weighted average) offers reassurance that the bias is not too large. It might be argued that exporter's production weights are also misleading, that Thailand and Vietnam have much less propensity to export rice than produce it. But then why do rich countries maintain such high barriers against them?

These estimates are for the data year of 2001, at which time Canada, the European Union, and the United States maintained textile and apparel import quotas. Francois and Spinanger estimate the export tax equivalents of these quotas. I use the version of their estimates that are free of some constraints imposed for consistency with GTAP 6.0. The final column of Table 2 shows what happens when these export tax equivalents are chained with tariffs in the GTAP "textiles" and "wearing apparel" categories. Since the quotas ended on January 1, 2005, they are left out of all results reported hereafter.

Table 3 and Table 4 decompose the results for the preferred Variant 6 by exporter's region and income group, using World Bank definitions of these categories. There is some evidence that rich countries erect the highest barriers against those regions with which they have the most propensity to trade. Japan's protection is highest against its neighbors in Asia while the Swiss and Norwegians put the highest tariffs on goods from the Americas, with Eastern Europe a close second. More importantly, in the stratification by income group, there is little sign that preferences for the poorest countries are a major factor. ("Upper income" here refers to non-DAC exporters such as Hong Kong and Slovenia.) EU tariffs against low-income countries average 6.54%, only slightly below the 7.84% for lower-middle income countries, and well above the 3.85% for high-income countries. Norwegian and Swiss tariffs are actually measured as higher for low-income countries that lower-middle income ones. And the highest number in the table is

for Japan's protection with respect to low-income countries, a striking 40.12%.

**Table 3. Protection with respect to non-DAC countries, 2001, by region, Variant 6 (ad valorem equivalent, %)**

| Country | Americas | East and South Asia | Middle East & N. Africa | Eastern Europe | Sub-Saharan Africa |
|---|---|---|---|---|---|
| Australia | 4.7 | 4.5 | 4.1 | 4.2 | 3.2 |
| Canada | 4.1 | 3.8 | 3.7 | 4.3 | 2.2 |
| EU-15 | 7.6 | 8.9 | 4.6 | 5.5 | 4.3 |
| Japan | 15.8 | 36.0 | 19.4 | 18.3 | 21.7 |
| New Zealand | 2.4 | 3.0 | 1.6 | 2.3 | 1.5 |
| Norway | 21.2 | 13.7 | 15.2 | 20.6 | 16.5 |
| Switzerland | 16.8 | 7.2 | 12.9 | 14.6 | 7.9 |
| United States | 2.2 | 3.5 | 1.9 | 2.4 | 1.3 |

**Table 4. Protection with respect to non-DAC countries, 2001, by income group, Variant 6 (ad valorem equivalent, %)**

| Country | Low income | Lower middle income | Middle income | Upper middle income | Upper income |
|---|---|---|---|---|---|
| Australia | 3.96 | 4.22 | 4.35 | 5.06 | 3.84 |
| Canada | 3.06 | 3.88 | 4.22 | 3.86 | 3.38 |
| EU-15 | 6.54 | 7.84 | 5.95 | 7.13 | 3.85 |
| Japan | 40.12 | 25.02 | 13.85 | 25.47 | 14.79 |
| New Zealand | 4.95 | 2.45 | 2.18 | 2.85 | 1.89 |
| Norway | 18.81 | 16.39 | 18.80 | 5.64 | 8.62 |
| Switzerland | 11.89 | 9.88 | 13.74 | 6.43 | 9.38 |
| United States | 2.29 | 3.11 | 2.05 | 2.83 | 1.85 |

## 2. A closer look at agriculture

Especially now that the old quotas on textiles and apparel have been abolished, domestic agricultural subsidies loom as the most important non-tariff trade impediment maintained by rich countries. It is often said that OECD governments spend $300 billion a year subsidizing agricultural production. Although aid to rich-country farmers is copious, the $300 billion figure is wrong, so phrased. Rather, OECD farmers and food buyers receive support by virtue of government policy that is equivalent to nearly $300 billion in subsidies, as measured by the OECD's (2004) Total Support Estimate (TSE). Much of this benefit is actually delivered in the form of tariffs, which the OECD converts to subsidy equivalents. Much of the rest includes "general services" such as agricultural education and R&D, trans-

fers to consumers rather than producers, and transfers to producers in ways that create little incentive for additional production, thus little trade distortion.

The purpose at hand is to measure government payments that distort trade, which calls for a narrower definition of subsidy. This section offers such a definition, and how the subsidy totals generated by it are converted to tariff equivalents in order to allow comparison with the previous section's results.

Table 5 lays out the subsidy definition with aggregates across all agricultural products covered in order to give a sense of the magnitudes involved. The OECD tracks three major kinds of support: support to producers, general services such as agricultural extension and inspection services, and support to consumers. The first major subcategory of producer support is Market Price Support (MPS, row B of the table), which is the additional income accruing to producers because their farmgate prices are higher than world prices. Governments maintain these price differentials with two kinds of border measures: barriers to imports and subsidies for exports. Import barriers account for the lion's share of MPS in OECD countries and, because they generate transfers from domestic consumers to domestic producers, also show up as negative entries under support to consumers (row T). Spending on export subsidies can be inferred by taking the algebraic sum of MPS and transfers from consumers to producers (see row X).

The other subcategories of producer support do represent government expenditure. And many of these are counted here as distorting production, including "Payments based on output, "Payments based on area planted/animal numbers," "Counter cyclical payments," "Payments based on input use," and "Payments based on input constraints." "Payments based on historical entitlements" are also counted, but at 50 cents on the dollar. In theory, these subsidies are decoupled from present production and shouldn't

distort it, but they are often administered in ways that do. For example, the U.S. formally decoupled many support payments in 1996—but then disbursed an extra $8.6 billion/year in "emergency assistance" during 1998–2001, and in 2002 allowed farmers to update the base figures for their "decoupled" subsidies. And some EU payments are decoupled only at the national or regional level. Allocation within regions is still based on actual production (de Gorter, Ingco, and Ignacio 2003).

To these are added export subsidies. Throughout, three-year averages are used because subsidy levels are sensitive to volatile world prices and the weather. For the countries of interest here, total trade-distorting subsidies are estimated at $77.5 billion/year for 2001–03. Of this, only $2.7 billion is export subsidies, the type often singled out by NGOs and politicians

**Table 5. Production-distorting agricultural payments and Total Support Estimate of OECD, 2001–03 averages**

| | Australia | Canada | EU-15 | Japan | N. Zea-land | Norway | Switzer-land | United States | Total ($) |
|---|---|---|---|---|---|---|---|---|---|
| ***National currency figures*** | | | | | | | | | |
| A. Producer Support Estimate (PSE) | 1,552 | 7,002 | 102,708 | 5,359 | 221 | 20,741 | 7,586 | 44,239 | |
| B. Market Price Support (MPS) | 6 | 3,383 | 58,311 | 4,824 | 174 | 9,438 | 4,353 | 16,836 | |
| C. Payments based on output | 0 | 337 | 3,792 | 166 | 0 | 2,442 | 364 | 4,841 | |
| D. Payments based on area planted/animal numbers | 37 | 788 | 28,027 | 0 | 0 | 3,473 | 905 | 2,902 | |
| E. "Counter cyclical payments" | | | | | | | | 1,426 | |
| F. Payments based on historical entitlements | 183 | 989 | 608 | 0 | 0 | 579 | 1,302 | 6,828 | |
| G. Payments based on input use | 1,041 | 484 | 7,908 | 247 | 47 | 3,911 | 336 | 7,222 | |
| H. Payments based on input constraints | 0 | 1 | 4,073 | 122 | 0 | 368 | 130 | 1,978 | |
| I. Payments based on overall farming income | 285 | 909 | 0 | 0 | 0 | 530 | 0 | 2,206 | |
| J. Miscellaneous payments | 0 | 111 | –11 | 0 | 0 | 0 | 196 | | |
| K. General Services Support Estimate (GSSE) | 909 | 2455 | 9410 | 1461 | 220 | 1436 | 532 | 27159 | |
| L. Research and development | 591 | 447 | 1550 | 54 | 114 | 688 | 93 | 2569 | |
| M. Agricultural schools | 0 | 248 | 901 | 52 | 12 | 0 | 22 | 0 | |
| N. Inspection services | 92 | 591 | 369 | 11 | 66 | 273 | 13 | 734 | |
| O. Infrastructure | 201 | 538 | 1973 | 1074 | 27 | 210 | 97 | 4125 | |
| P. Marketing and promotion | 8 | 632 | 3138 | 26 | 0 | 114 | 65 | 17434 | |
| Q. Public stockholding | 0 | 0 | 1343 | 46 | 0 | 14 | 47 | 123 | |
| R. Miscellaneous | 16 | 0 | 135 | 199 | 1 | 139 | 196 | 2174 | |
| S. Consumer Support Estimate (CSE) | –215 | –3,540 | –51,904 | –6,732 | –162 | –9,209 | –5,105 | 4,816 | |
| T. Transfers to producers from consumers | –3 | –3,324 | –55,537 | –4,823 | –162 | -10,217 | –4,415 | –16,833 | |
| Other transfers from consumers | –1 | –255 | –698 | –1,917 | 0 | –420 | –1,031 | –2,081 | |
| U. Transfers to consumers from taxpayers | –211 | 28 | 3,762 | 5 | 0 | 520 | 230 | 23,729 | |
| V. Excess feed cost | 0 | 11 | 570 | 3 | 0 | 909 | 111 | 0 | |
| W. *OECD Total Support Estimate (A+K+U)* | 2,250 | 9,485 | 115,880 | 6,825 | 441 | 22,697 | 8,348 | 95,127 | |
| X. Export subsidies (B+T) | 3 | 59 | 2,774 | 1 | 12 | –779 | –62 | 3 | |
| Y. Other direct trade-distorting subsidies (C+D+E+F/2+G+H) | 1,170 | 2,105 | 44,104 | 535 | 47 | 10,484 | 2,386 | 21,783 | |
| Z. Exchange rate/$ | 1.75 | 1.5 | 1.01 | 0.12 | 2 | 7.94 | 1.52 | 1 | |
| ***Dollar figures*** | | | | | | | | | |
| *AA. OECD Total Support Estimate (W/Z)* | 1,286 | 6,323 | 114,733 | 56,875 | 221 | 2,859 | 5,492 | 95,127 | 282,915 |
| AB. Export subsidies (X/Z) | 2 | 39 | 2,746 | 8 | 6 | –98 | –41 | 3 | 2,666 |
| AC. Other trade-distorting subsidies (Y/Z) | 667 | 1,405 | 43,663 | 4,427 | 24 | 1,320 | 1,567 | 21,783 | 74,855 |
| **Total trade-distorting subsidies (AB+AC)** | **668** | **1,444** | **46,409** | **4,436** | **30** | **1,222** | **1,526** | **21,786** | **77,521** |

The aggregate data in Table 5 do not in fact enter the calculations described here. Rather, more detailed data from the OECD (2004) by commodity group (beef, oats, etc.) are used, in the same way. The OECD and GTAP databases categorize agricultural products differently; some GTAP categories are subdivided in the OECD subsidy database, and vice versa in the case of rice, which GTAP splits between paddy and processed rice. In order to integrate the two agricultural data sets, I aggregate both into 9 supercategories, 8 of which are strict GTAP categories and one of which is rice. Again, I aggregate the tariff estimates using production weights.

The formula for translating production subsidies into tariff equivalents is based on Cline (2004, ch. 3). It derives from a partial equilibrium analysis that asks what uniform *ad valorem* tariff level would depress imports as much as a given production subsidy. Inputs to the formula are subsidies, *s*, and imports, $\varphi_M$, both as shares of the farmgate value of production; the *ad valorem* tariff equivalent of border measures, *t*; and the absolute value of the price elasticity of demand for imports, $\beta$. $\beta$ is in turn estimated as $\sigma_D(1-\phi_M)$, where $\sigma_D$ is the elasticity of substitution in demand between domestic goods and imports, assumed to be 3.6, and $\phi_M$ is imports/consumption at world prices. Cline shows that, assuming that the elasticity of domestic supply is 1, a production subsidy causes a proportionate reduction in imports equal to[5]

$$1+\varphi_M\left(1+t\right)\left(1+\frac{1}{s}\right).$$

Meanwhile, the proportionate reduction caused by an additional and hypothetical *ad valorem* tariff, $\tau$, in place of the subsidy would be

$$\left(1+\tau\right)^{\beta}$$

[5] This is algebraically equivalent to Equation A8 of Cline 2004, Appendix 3A–2.

Equating the two expressions and solving yields the tariff-equivalent of the subsidy:

$$\tau = \left( 1 + \frac{1}{1 + \varphi_M (1+t)\left(1 + \frac{1}{s}\right)} \right)^{1/\beta} - 1.$$

This is the formula for the final column of Table A–2, which exhibits the calculations for each importer and product group.[6] Import and export data in the table are from the UNCTAD COMTRADE database, and are averages for 2002–03.[7]

The final two columns of appendix Table A–1 chain these subsidy tariff-equivalents with tariffs derived under Variant 6 in the previous section, in order to obtain estimates of overall protection in agriculture with respect to non-DAC countries. Table 6 summarizes the results for agriculture, by major commodity group. Table 7 performs the final aggregations, across all agriculture and across all goods.

Australia and New Zealand have extremely low agricultural tariffs against developing countries, at 0.83% and 0.37% in across-the-board *ad valorem* terms. New Zealand matches the low tariffs with

[6] This is nearly equivalent to equation A10 of Cline (2004, ch. 3, appendix 3A–2), differing only in that the elasticity $\beta$ enters as an exponent. Cline's formula is equivalent to

$$\tau = \frac{1}{\beta} \frac{1}{1 + \varphi_M (1+t)\left(1 + \frac{1}{s}\right)},$$

which is the first term in a Taylor expansion of the formula used here.

[7] 2001 data are not available via the web interface for this database.

minimal subsidies, equivalent to just 1.09% in tariff terms; but subsidies in Australia are somewhat more substantial, equivalent to a 6.37% tariff. Along with the United States, the next-lowest on tariffs, these three countries impede agricultural imports from developing countries more through subsidies than tariffs. All, however, maintain relatively low barriers in aggregate. The other rich countries, especially Japan, Norway, and Switzerland, have higher barriers, which are imposed mainly through tariffs. This is perhaps not surprising since tariffs are cheaper for a government than subsidies. Moreover, production subsidies are not as efficient at impeding imports. Paying a farmer based on outputs, inputs, etc., does not as directly interfere with imports.

The correlations between the top and bottom halves of Table 7 suggest that agricultural protection is in turn the dominant source of variation in levels of overall protection in goods. An examination of the details in Table A–1 bears this out. Protection tends to be much lower in textiles, apparel, and other manufactures, for example. In sum, then, agricultural tariffs are the major source of difference among rich countries in protection with respect to poor ones. Switzerland, Norway, and Japan impose the highest agricultural tariffs, equivalent to uniform ad valorem tariffs of 50.86%, 89.44%, and 158.14% respectively, and are also highest in overall goods protection, in the same order.

The final column of Table 7 compares this paper's results with those of Cline (2004). The differences are remarkably small for the EU-15 and United States, despite Cline's use of a different methodology and GTAP 5 data. The factor-two difference for Japan appears to be largely explained by different estimates for the tariff equivalent of rice TRQs. GTAP 5 used the simple average of the two tariffs in a TRQ. MAcMap uses the low rate when quotas are less than 90% filled, the simple average for fill rates of 90–100%, and the high rate for fill rates above 100%.GTAP 5 puts Japanese paddy and process rice

tariffs both at 409% (Dimaranan and McDougall 2002, p. 4–6). The MAcMap-based figures reported here (Table A–1) are 844% and 919%.

**Table 6. *Ad valorem* tariffs with respect to non-DAC countries and tariff-equivalents of subsidies, agriculture, by importer and major product group (%)**

| Importer | Rice | Wheat | Corn & other grains | Sugar | Vege-tables, fruit, nuts | Beef & sheep-meat | Pork, poul-try, other meat | Dairy, eggs | Oil seeds | Wool |
|---|---|---|---|---|---|---|---|---|---|---|
| **Tariffs, 2001** | | | | | | | | | | |
| Australia | 0.0 | 0.0 | 0.0 | 10.0 | 0.8 | 0.0 | 0.7 | 0.9 | 0.8 | 0.2 |
| Canada | 0.0 | 2.6 | 0.3 | 4.5 | 1.8 | 8.4 | 39.5 | 97.7 | 0.0 | 0.0 |
| EU-15 | 110.8 | 0.7 | 17.2 | 90.4 | 19.1 | 75.8 | 15.2 | 38.0 | 0.0 | 0.0 |
| Japan | 886.7 | 214.4 | 53.2 | 227.0 | 21.4 | 38.2 | 36.5 | 82.4 | 1.6 | 1.2 |
| New Zealand | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 2.7 | 1.3 | 0.0 | 0.0 |
| Norway | 29.1 | 208.4 | 114.8 | 56.6 | 19.9 | 222.7 | 224.3 | 134.0 | 48.6 | 0.0 |
| Switzerland | 6.6 | 131.6 | 77.7 | 100.9 | 30.5 | 168.2 | 111.3 | 106.8 | 21.2 | 0.0 |
| U.S. | 5.2 | 3.2 | 0.9 | 24.2 | 5.0 | 2.6 | 3.3 | 16.7 | 8.7 | 1.6 |
| **Tariff equivalents of subsidies, 2001–03** | | | | | | | | | | |
| Australia | 6.8 | 16.1 | 18.5 | 19.5 | 0.0 | 20.8 | 5.6 | 17.4 | 5.8 | 20.1 |
| Canada | 0.0 | 19.1 | 11.7 | 0.0 | –1.3 | 9.3 | 4.8 | 2.7 | 13.2 | 0.0 |
| EU-15 | 12.8 | 20.4 | 20.7 | 4.6 | 2.4 | 18.7 | 10.3 | 13.7 | 14.3 | 0.0 |
| Japan | 13.8 | 4.1 | 3.8 | 2.4 | 1.6 | 3.5 | 0.6 | 6.9 | 16.1 | 0.0 |
| New Zealand | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.8 | 5.3 | 5.7 | 0.0 | 0.0 |
| Norway | 0.0 | 9.5 | 19.5 | 0.0 | 0.0 | 19.3 | 2.4 | 20.7 | 0.0 | 21.5 |
| Switzerland | 0.0 | 11.3 | 12.2 | 6.3 | 0.0 | 13.7 | 6.2 | 20.3 | 16.4 | 0.0 |
| U.S. | 20.5 | 21.0 | 20.1 | 4.8 | 13.0 | 7.2 | 9.0 | 11.9 | 20.5 | 4.8 |
| **Tariffs & subsidies combined** | | | | | | | | | | |
| Australia | 6.8 | 16.1 | 18.5 | 31.5 | 0.8 | 20.8 | 6.4 | 18.5 | 6.6 | 20.3 |
| Canada | 0.0 | 22.1 | 12.0 | 4.5 | 0.5 | 18.5 | 46.1 | 103.1 | 13.2 | 0.0 |
| EU-15 | 137.8 | 21.2 | 41.5 | 99.2 | 22.0 | 108.6 | 27.2 | 57.0 | 14.3 | 0.0 |
| Japan | 1023.1 | 227.3 | 58.9 | 234.8 | 23.4 | 43.1 | 37.3 | 95.0 | 18.0 | 1.2 |
| New Zealand | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 5.9 | 8.2 | 7.1 | 0.0 | 0.0 |
| Norway | 29.1 | 237.8 | 156.7 | 56.6 | 19.9 | 284.9 | 232.2 | 182.3 | 48.6 | 21.5 |
| Switzerland | 6.6 | 157.7 | 99.5 | 113.5 | 30.5 | 204.9 | 124.4 | 148.8 | 41.0 | 0.0 |
| U.S. | 26.8 | 24.9 | 21.1 | 30.2 | 18.6 | 10.0 | 12.7 | 30.6 | 31.0 | 6.5 |

**Table 7. Aggregate protection in rich countries with respect to non-DAC countries, agriculture and all goods, uniform *ad valorem* equivalents**

| | Tariffs (Variant 6), 2001 | Subsidies, 2001–03 | **Tariffs and subsidies combined** | Memo: Cline (2004) Aggregate Measure of Protection |
|---|---|---|---|---|
| **Agriculture** | | | | |
| Australia | 0.8 | 6.4 | **7.3** | |
| Canada | 10.8 | 2.8 | **14.0** | 52.26 |
| EU-15 | 34.4 | 7.7 | **45.7** | 46.37 |
| Japan | 158.1 | 3.9 | **179.1** | 82.05 |
| New Zealand | 0.4 | 1.1 | **1.5** | |
| Norway | 89.4 | 3.9 | **99.8** | |
| Switzerland | 50.9 | 4.5 | **60.1** | |
| United States | 5.0 | 10.7 | **16.4** | 19.92 |
| **All goods** | | | | |
| Australia | 4.4 | 1.1 | **5.4** | |
| Canada | 3.9 | 0.7 | **4.7** | 10.68 |
| EU-15 | 7.5 | 1.4 | **9.4** | 9.53 |
| Japan | 26.9 | 2.5 | **32.6** | 15.55 |
| New Zealand | 2.6 | 0.2 | **2.7** | |
| Norway | 16.8 | 0.6 | **18.3** | |
| Switzerland | 11.0 | 0.5 | **12.1** | |
| United States | 2.8 | 1.4 | **4.3** | 4.01 |

Note: "Agriculture" includes the GTAP 6.0 product categories that correspond approximately to the coverage of the OECD subsidy database: Animal products; Cattle, sheep; Cattle, sheep meat; Dairy products; Oil seeds; Other grains; Other meat; Paddy rice; Plant-based fibers; Processed rice; Sugar; Sugar cane; Vegetables, fruit; Wheat.

Given the evidence that rich-country agricultural subsidies are less important for developing countries than tariffs, why have they received so much public attention? Table 8 borrows an idea from the Catholic Agency for Overseas Development to suggest one reason. Leaving aside the trade effect, government payments to agriculture also consume government funds. Economists call that an opportunity cost. Activists call it unjust. The table shows total government payments to agriculture for 2003, including payments excluded above as non-distortionary, per head of the relevant kind of livestock. Livestock figures are from the U.N. Food and Agriculture Organization's FAOSTAT database. Subsidies for cattle include those for milk, those for chicken include eggs, and those for sheep include wool. The final column shows Net Aid Transfers (Roodman 2006b) per poor person in developing countries, where "the poor"

are the 2.7 billion people living on less that $2 a day.[8] The rich countries as a whole give $106 in subsidies per cow, $16 per sheep, $10 per pig, and $14.50 per poor person.

**Table 8. Subsidies per rich-country animal and aid per poor person, 2003 ($)**

| | Subsidies per head of livestock | | | | Net aid transfers per poor person in developing countries |
|---|---|---|---|---|---|
| | Cattle | Chickens | Pigs | Sheep | |
| Australia | 18.37 | 0.41 | 7.12 | 1.12 | 0.44 |
| Canada | 92.19 | 0.46 | 17.34 | 0.00 | 0.71 |
| EU-15 | 200.09 | 0.36 | 10.52 | 35.45 | 11.03 |
| Japan | 160.64 | 0.23 | 5.17 | 0.00 | 2.20 |
| New Zealand | 2.55 | 0.47 | 0.44 | 0.05 | 0.06 |
| Norway | 964.98 | 0.85 | 51.50 | 91.07 | 0.75 |
| Switzerland | 985.87 | 2.63 | 140.35 | 15.74 | 0.46 |
| United States | 41.34 | 0.43 | 6.16 | 2.22 | 5.26 |
| Total | 106.54 | 0.40 | 10.48 | 15.76 | 14.50 |

## 3. Conclusion

The methodology described here is not as sophisticated as the general equilibrium approach of Anderson and Neary and the intensely econometric techniques of Kee, Nicita, and Olarreaga. But within a relatively simple conceptual framework, using high-quality and detailed data from the MAcMap data set, it produces plausible results. Indeed, the results make more sense that those derived purely using MAcMap weights, which appear to introduce substantial endogeneity bias when aggregating across major product groups.

With respect to developing countries, New Zealand is least protective, followed by the United States, Canada, and Australia. EU barriers are about three times as high as those of the United States in agriculture, and twice as high overall. Non-EU members Norway and Switzerland use their policy freedom to

[8] Net Aid Transfers differs from the standard Net Overseas Development Assistance (ODA) in netting out interest payments received on ODA loans and cancellation of non-ODA loans.

erect even higher barriers, and Japan's well-known barriers against rice rank it as most protective. Overall, agricultural tariffs—not the subsidies so frequently cited in the media—are the largest barrier to exports from developing countries. The public attention paid to export subsidies has also been quite disproportionate. In the EU-15, for example, export subsidies are only 6.3% of all subsidies, which in turn are responsible for only about 20% of protection in agriculture with respect to developing countries. In other words, export subsidies are responsible for only 1.3% of the overall protective effect in EU agriculture. What partly explains the attention to agricultural subsidies is their sheer cost, which rivals spending on foreign aid.

## Appendix. Detailed tables

### Table A–1. MAcMap protection and weights with respect to non-DAC countries, and production weights, by importer and GTAP product group (%)

| Country name | Product name | Tariffs[1] (%) | MAcMap weight (%) | Production weight (%) | Tariff equivalent of subsidies (%) | Tariffs & subsidies (%) |
|---|---|---|---|---|---|---|
| Australia | Beverages and tobacco products | 0.44 | 2.83 | 15.75 | 0.00 | 15.75 |
| Australia | Sugar cane, sugar beet | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 |
| Australia | Bovine meat products | 0.09 | 0.89 | 0.00 | 20.76 | 20.76 |
| Australia | Coal | 0.55 | 0.56 | 0.00 | 0.00 | 0.00 |
| Australia | Chemical, rubber, plastic products | 6.15 | 9.33 | 3.56 | 0.00 | 3.56 |
| Australia | Bovine cattle, sheep and goats, horses | 0.06 | 0.88 | 0.00 | 0.00 | 0.00 |
| Australia | Electronic equipment | 19.88 | 6.20 | 0.96 | 0.00 | 0.96 |
| Australia | Electricity | 0.09 | 2.56 | 0.00 | 0.00 | 0.00 |
| Australia | Metal products | 1.86 | 2.87 | 5.46 | 0.00 | 5.46 |
| Australia | Forestry | 0.21 | 0.86 | 0.18 | 0.00 | 0.18 |
| Australia | Fishing | 0.22 | 0.97 | 0.20 | 0.00 | 0.20 |
| Australia | Gas | 1.89 | 0.97 | 0.00 | 0.00 | 0.00 |
| Australia | Gas manufacture, distribution | 0.00 | 0.15 | 5.00 | 0.00 | 5.00 |
| Australia | Cereal grains nec | 0.10 | 0.78 | 0.00 | 18.48 | 18.48 |
| Australia | Ferrous metals | 2.01 | 3.51 | 3.88 | 0.00 | 3.88 |
| Australia | Leather products | 2.53 | 1.55 | 8.04 | 0.00 | 8.04 |
| Australia | Wood products | 2.69 | 2.04 | 4.65 | 0.00 | 4.65 |
| Australia | Dairy products | 0.08 | 0.83 | 0.92 | 17.44 | 18.52 |
| Australia | Motor vehicles and parts | 4.87 | 3.63 | 13.86 | 0.00 | 13.86 |
| Australia | Metals nec | 3.37 | 2.20 | 0.76 | 0.00 | 0.76 |
| Australia | Mineral products nec | 1.11 | 4.07 | 3.91 | 0.00 | 3.91 |
| Australia | Animal products nec | 0.21 | 2.37 | 0.00 | 0.00 | 0.00 |
| Australia | Crops nec | 0.93 | 1.36 | 0.02 | 0.00 | 0.02 |
| Australia | Food products nec | 2.66 | 4.70 | 1.84 | 0.00 | 1.84 |
| Australia | Oil | 12.73 | 3.80 | 5.47 | 0.00 | 5.47 |
| Australia | Machinery and equipment nec | 10.40 | 8.00 | 4.04 | 0.00 | 4.04 |
| Australia | Manufactures nec | 3.78 | 2.85 | 2.74 | 0.00 | 2.74 |
| Australia | Minerals nec | 1.46 | 1.88 | 0.20 | 0.00 | 0.20 |
| Australia | Meat products nec | 0.32 | 1.33 | 0.75 | 5.61 | 6.40 |
| Australia | Oil seeds | 0.23 | 0.59 | 0.81 | 5.79 | 6.65 |
| Australia | Transport equipment nec | 1.79 | 1.64 | 1.92 | 0.00 | 1.92 |
| Australia | Petroleum, coal products | 2.84 | 4.11 | 0.00 | 0.00 | 0.00 |
| Australia | Processed rice | 0.05 | 1.13 | 0.00 | 6.79 | 6.79 |
| Australia | Paddy rice | 0.01 | 0.87 | 0.00 | 6.79 | 6.79 |
| Australia | Plant-based fibers | 0.08 | 0.34 | 0.00 | 0.00 | 0.00 |
| Australia | Paper products, publishing | 1.09 | 3.10 | 3.09 | 0.00 | 3.09 |
| Australia | Sugar | 0.15 | 0.76 | 10.05 | 19.52 | 31.53 |
| Australia | Textiles | 4.97 | 5.05 | 15.05 | 0.00 | 15.05 |
| Australia | Vegetables, fruit, nuts | 1.07 | 3.86 | 0.81 | 0.00 | 0.81 |
| Australia | Vegetable oils and fats | 0.50 | 0.74 | 1.03 | 0.00 | 1.03 |
| Australia | Wearing apparel | 6.43 | 2.66 | 22.18 | 0.00 | 22.18 |
| Australia | Wheat | 0.05 | 0.79 | 0.00 | 16.11 | 16.11 |
| Australia | Wool, silk-worm cocoons | 0.02 | 0.17 | 0.16 | 20.07 | 20.27 |
| Canada | Beverages and tobacco products | 0.44 | 2.83 | 6.93 | 0.00 | 6.93 |
| Canada | Sugar cane, sugar beet | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 |
| Canada | Bovine meat products | 0.09 | 0.89 | 8.40 | 9.34 | 18.53 |
| Canada | Coal | 0.55 | 0.56 | 0.00 | 0.00 | 0.00 |
| Canada | Chemical, rubber, plastic products | 6.15 | 9.33 | 1.41 | 0.00 | 1.41 |
| Canada | Bovine cattle, sheep and goats, horses | 0.06 | 0.88 | 0.00 | 0.00 | 0.00 |
| Canada | Electronic equipment | 19.88 | 6.20 | 0.13 | 0.00 | 0.13 |

| Country name | Product name | Tariffs[1] (%) | MAcMap weight (%) | Production weight (%) | Tariff equivalent of subsidies (%) | Tariffs & subsidies (%) |
|---|---|---|---|---|---|---|
| Canada | Electricity | 0.09 | 2.56 | 0.00 | 0.00 | 0.00 |
| Canada | Metal products | 1.86 | 2.87 | 2.28 | 0.00 | 2.28 |
| Canada | Forestry | 0.21 | 0.86 | 0.26 | 0.00 | 0.26 |
| Canada | Fishing | 0.22 | 0.97 | 0.33 | 0.00 | 0.33 |
| Canada | Gas | 1.89 | 0.97 | 0.64 | 0.00 | 0.64 |
| Canada | Gas manufacture, distribution | 0.00 | 0.15 | 5.93 | 0.00 | 5.93 |
| Canada | Cereal grains nec | 0.10 | 0.78 | 0.32 | 11.67 | 12.04 |
| Canada | Ferrous metals | 2.01 | 3.51 | 0.37 | 0.00 | 0.37 |
| Canada | Leather products | 2.53 | 1.55 | 8.30 | 0.00 | 8.30 |
| Canada | Wood products | 2.69 | 2.04 | 2.02 | 0.00 | 2.02 |
| Canada | Dairy products | 0.08 | 0.83 | 97.69 | 2.75 | 103.12 |
| Canada | Motor vehicles and parts | 4.87 | 3.63 | 3.36 | 0.00 | 3.36 |
| Canada | Metals nec | 3.37 | 2.20 | 0.05 | 0.00 | 0.05 |
| Canada | Mineral products nec | 1.11 | 4.07 | 1.00 | 0.00 | 1.00 |
| Canada | Animal products nec | 0.21 | 2.37 | 6.45 | 0.00 | 6.45 |
| Canada | Crops nec | 0.93 | 1.36 | 0.47 | 0.00 | 0.47 |
| Canada | Food products nec | 2.66 | 4.70 | 4.38 | 0.00 | 4.38 |
| Canada | Oil | 12.73 | 3.80 | 0.00 | 0.00 | 0.00 |
| Canada | Machinery and equipment nec | 10.40 | 8.00 | 1.09 | 0.00 | 1.09 |
| Canada | Manufactures nec | 3.78 | 2.85 | 1.42 | 0.00 | 1.42 |
| Canada | Minerals nec | 1.46 | 1.88 | 0.00 | 0.00 | 0.00 |
| Canada | Meat products nec | 0.32 | 1.33 | 39.48 | 4.76 | 46.11 |
| Canada | Oil seeds | 0.23 | 0.59 | 0.00 | 13.20 | 13.20 |
| Canada | Transport equipment nec | 1.79 | 1.64 | 7.61 | 0.00 | 7.61 |
| Canada | Petroleum, coal products | 2.84 | 4.11 | 0.27 | 0.00 | 0.27 |
| Canada | Processed rice | 0.05 | 1.13 | 0.00 | 0.00 | 0.00 |
| Canada | Paddy rice | 0.01 | 0.87 | 0.00 | 0.00 | 0.00 |
| Canada | Plant-based fibers | 0.08 | 0.34 | 0.00 | 0.00 | 0.00 |
| Canada | Paper products, publishing | 1.09 | 3.10 | 0.08 | 0.00 | 0.08 |
| Canada | Sugar | 0.15 | 0.76 | 4.46 | 0.00 | 4.46 |
| Canada | Textiles | 4.97 | 5.05 | 11.41 | 0.00 | 11.41 |
| Canada | Vegetables, fruit, nuts | 1.07 | 3.86 | 1.76 | -1.26 | 0.48 |
| Canada | Vegetable oils and fats | 0.50 | 0.74 | 2.24 | 0.00 | 2.24 |
| Canada | Wearing apparel | 6.43 | 2.66 | 15.31 | 0.00 | 15.31 |
| Canada | Wheat | 0.05 | 0.79 | 2.57 | 19.09 | 22.15 |
| Canada | Wool, silk-worm cocoons | 0.02 | 0.17 | 0.00 | 0.00 | 0.00 |
| EU-15 | Beverages and tobacco products | 0.44 | 2.83 | 10.54 | 0.00 | 10.54 |
| EU-15 | Sugar cane, sugar beet | 0.00 | 0.19 | 71.85 | 0.00 | 71.85 |
| EU-15 | Bovine meat products | 0.09 | 0.89 | 75.79 | 18.66 | 108.58 |
| EU-15 | Coal | 0.55 | 0.56 | 0.00 | 0.00 | 0.00 |
| EU-15 | Chemical, rubber, plastic products | 6.15 | 9.33 | 1.32 | 0.00 | 1.32 |
| EU-15 | Bovine cattle, sheep and goats, horses | 0.06 | 0.88 | 15.44 | 0.00 | 15.44 |
| EU-15 | Electronic equipment | 19.88 | 6.20 | 0.85 | 0.00 | 0.85 |
| EU-15 | Electricity | 0.09 | 2.56 | 0.00 | 0.00 | 0.00 |
| EU-15 | Metal products | 1.86 | 2.87 | 1.26 | 0.00 | 1.26 |
| EU-15 | Forestry | 0.21 | 0.86 | 0.14 | 0.00 | 0.14 |
| EU-15 | Fishing | 0.22 | 0.97 | 4.63 | 0.00 | 4.63 |
| EU-15 | Gas | 1.89 | 0.97 | 0.00 | 0.00 | 0.00 |
| EU-15 | Gas manufacture, distribution | 0.00 | 0.15 | 0.00 | 0.00 | 0.00 |
| EU-15 | Cereal grains nec | 0.10 | 0.78 | 17.25 | 20.72 | 41.55 |
| EU-15 | Ferrous metals | 2.01 | 3.51 | 3.38 | 0.00 | 3.38 |
| EU-15 | Leather products | 2.53 | 1.55 | 5.62 | 0.00 | 5.62 |
| EU-15 | Wood products | 2.69 | 2.04 | 0.41 | 0.00 | 0.41 |
| EU-15 | Dairy products | 0.08 | 0.83 | 38.02 | 13.73 | 56.97 |
| EU-15 | Motor vehicles and parts | 4.87 | 3.63 | 2.73 | 0.00 | 2.73 |

| Country name | Product name | Tariffs[1] (%) | MAcMap weight (%) | Production weight (%) | Tariff equivalent of subsidies (%) | Tariffs & subsidies (%) |
|---|---|---|---|---|---|---|
| EU-15 | Metals nec | 3.37 | 2.20 | 1.61 | 0.00 | 1.61 |
| EU-15 | Mineral products nec | 1.11 | 4.07 | 2.37 | 0.00 | 2.37 |
| EU-15 | Animal products nec | 0.21 | 2.37 | 4.84 | 0.00 | 4.84 |
| EU-15 | Crops nec | 0.93 | 1.36 | 2.14 | 0.00 | 2.14 |
| EU-15 | Food products nec | 2.66 | 4.70 | 9.16 | 0.00 | 9.16 |
| EU-15 | Oil | 12.73 | 3.80 | 0.00 | 0.00 | 0.00 |
| EU-15 | Machinery and equipment nec | 10.40 | 8.00 | 0.45 | 0.00 | 0.45 |
| EU-15 | Manufactures nec | 3.78 | 2.85 | 1.15 | 0.00 | 1.15 |
| EU-15 | Minerals nec | 1.46 | 1.88 | 0.16 | 0.00 | 0.16 |
| EU-15 | Meat products nec | 0.32 | 1.33 | 15.24 | 10.35 | 27.16 |
| EU-15 | Oil seeds | 0.23 | 0.59 | 0.00 | 14.27 | 14.27 |
| EU-15 | Transport equipment nec | 1.79 | 1.64 | 1.16 | 0.00 | 1.16 |
| EU-15 | Petroleum, coal products | 2.84 | 4.11 | 0.63 | 0.00 | 0.63 |
| EU-15 | Processed rice | 0.05 | 1.13 | 137.22 | 12.83 | 167.64 |
| EU-15 | Paddy rice | 0.01 | 0.87 | 76.62 | 12.83 | 99.28 |
| EU-15 | Plant-based fibers | 0.08 | 0.34 | 0.00 | 0.00 | 0.00 |
| EU-15 | Paper products, publishing | 1.09 | 3.10 | 0.14 | 0.00 | 0.14 |
| EU-15 | Sugar | 0.15 | 0.76 | 90.37 | 4.63 | 99.19 |
| EU-15 | Textiles | 4.97 | 5.05 | 5.90 | 0.00 | 5.90 |
| EU-15 | Vegetables, fruit, nuts | 1.07 | 3.86 | 19.12 | 2.40 | 21.98 |
| EU-15 | Vegetable oils and fats | 0.50 | 0.74 | 4.92 | 0.00 | 4.92 |
| EU-15 | Wearing apparel | 6.43 | 2.66 | 6.45 | 0.00 | 6.45 |
| EU-15 | Wheat | 0.05 | 0.79 | 0.67 | 20.36 | 21.17 |
| EU-15 | Wool, silk-worm cocoons | 0.02 | 0.17 | 0.00 | 0.00 | 0.00 |
| Japan | Beverages and tobacco products | 0.44 | 2.83 | 16.39 | 0.00 | 16.39 |
| Japan | Sugar cane, sugar beet | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 |
| Japan | Bovine meat products | 0.09 | 0.89 | 38.22 | 3.50 | 43.05 |
| Japan | Coal | 0.55 | 0.56 | 0.01 | 0.00 | 0.01 |
| Japan | Chemical, rubber, plastic products | 6.15 | 9.33 | 0.44 | 0.00 | 0.44 |
| Japan | Bovine cattle, sheep and goats, horses | 0.06 | 0.88 | 53.60 | 0.00 | 53.60 |
| Japan | Electronic equipment | 19.88 | 6.20 | 0.00 | 0.00 | 0.00 |
| Japan | Electricity | 0.09 | 2.56 | 0.00 | 0.00 | 0.00 |
| Japan | Metal products | 1.86 | 2.87 | 0.13 | 0.00 | 0.13 |
| Japan | Forestry | 0.21 | 0.86 | 0.79 | 0.00 | 0.79 |
| Japan | Fishing | 0.22 | 0.97 | 4.04 | 0.00 | 4.04 |
| Japan | Gas | 1.89 | 0.97 | 2.60 | 0.00 | 2.60 |
| Japan | Gas manufacture, distribution | 0.00 | 0.15 | 0.00 | 0.00 | 0.00 |
| Japan | Cereal grains nec | 0.10 | 0.78 | 53.18 | 3.75 | 58.93 |
| Japan | Ferrous metals | 2.01 | 3.51 | 0.39 | 0.00 | 0.39 |
| Japan | Leather products | 2.53 | 1.55 | 14.55 | 0.00 | 14.55 |
| Japan | Wood products | 2.69 | 2.04 | 0.64 | 0.00 | 0.64 |
| Japan | Dairy products | 0.08 | 0.83 | 82.44 | 6.90 | 95.03 |
| Japan | Motor vehicles and parts | 4.87 | 3.63 | 0.00 | 0.00 | 0.00 |
| Japan | Metals nec | 3.37 | 2.20 | 0.37 | 0.00 | 0.37 |
| Japan | Mineral products nec | 1.11 | 4.07 | 0.16 | 0.00 | 0.16 |
| Japan | Animal products nec | 0.21 | 2.37 | 11.02 | 0.00 | 11.02 |
| Japan | Crops nec | 0.93 | 1.36 | 1.27 | 0.00 | 1.27 |
| Japan | Food products nec | 2.66 | 4.70 | 12.11 | 0.00 | 12.11 |
| Japan | Oil | 12.73 | 3.80 | 0.00 | 0.00 | 0.00 |
| Japan | Machinery and equipment nec | 10.40 | 8.00 | 0.04 | 0.00 | 0.04 |
| Japan | Manufactures nec | 3.78 | 2.85 | 0.81 | 0.00 | 0.81 |
| Japan | Minerals nec | 1.46 | 1.88 | 0.39 | 0.00 | 0.39 |
| Japan | Meat products nec | 0.32 | 1.33 | 36.55 | 0.56 | 37.31 |
| Japan | Oil seeds | 0.23 | 0.59 | 1.62 | 16.09 | 17.97 |
| Japan | Transport equipment nec | 1.79 | 1.64 | 0.00 | 0.00 | 0.00 |

| Country name | Product name | Tariffs[1] (%) | MAcMap weight (%) | Production weight (%) | Tariff equivalent of subsidies (%) | Tariffs & subsidies (%) |
|---|---|---|---|---|---|---|
| Japan | Petroleum, coal products | 2.84 | 4.11 | 2.83 | 0.00 | 2.83 |
| Japan | Processed rice | 0.05 | 1.13 | 919.46 | 13.82 | 1060.37 |
| Japan | Paddy rice | 0.01 | 0.87 | 844.37 | 13.82 | 974.91 |
| Japan | Plant-based fibers | 0.08 | 0.34 | 0.00 | 0.00 | 0.00 |
| Japan | Paper products, publishing | 1.09 | 3.10 | 0.18 | 0.00 | 0.18 |
| Japan | Sugar | 0.15 | 0.76 | 227.02 | 2.38 | 234.80 |
| Japan | Textiles | 4.97 | 5.05 | 6.13 | 0.00 | 6.13 |
| Japan | Vegetables, fruit, nuts | 1.07 | 3.86 | 21.41 | 1.65 | 23.41 |
| Japan | Vegetable oils and fats | 0.50 | 0.74 | 4.83 | 0.00 | 4.83 |
| Japan | Wearing apparel | 6.43 | 2.66 | 9.73 | 0.00 | 9.73 |
| Japan | Wheat | 0.05 | 0.79 | 214.41 | 4.11 | 227.34 |
| Japan | Wool, silk-worm cocoons | 0.02 | 0.17 | 1.15 | 0.00 | 1.15 |
| New Zealand | Beverages and tobacco products | 0.44 | 2.90 | 16.30 | 0.00 | 16.30 |
| New Zealand | Sugar cane, sugar beet | 0.00 | 0.20 | 0.00 | 0.00 | 0.00 |
| New Zealand | Bovine meat products | 0.09 | 0.92 | 0.04 | 5.82 | 5.86 |
| New Zealand | Coal | 0.55 | 0.57 | 0.00 | 0.00 | 0.00 |
| New Zealand | Chemical, rubber, plastic products | 6.16 | 9.58 | 2.04 | 0.00 | 2.04 |
| New Zealand | Bovine cattle, sheep and goats, horses | 0.06 | 0.90 | 0.00 | 0.00 | 0.00 |
| New Zealand | Electronic equipment | 19.90 | 6.36 | 1.14 | 0.00 | 1.14 |
| New Zealand | Metal products | 1.87 | 2.95 | 2.94 | 0.00 | 2.94 |
| New Zealand | Forestry | 0.21 | 0.89 | 0.03 | 0.00 | 0.03 |
| New Zealand | Fishing | 0.22 | 0.99 | 0.31 | 0.00 | 0.31 |
| New Zealand | Gas | 1.89 | 1.00 | 0.00 | 0.00 | 0.00 |
| New Zealand | Gas manufacture, distribution | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 |
| New Zealand | Cereal grains nec | 0.10 | 0.81 | 0.00 | 0.00 | 0.00 |
| New Zealand | Ferrous metals | 2.01 | 3.60 | 1.91 | 0.00 | 1.91 |
| New Zealand | Leather products | 2.53 | 1.59 | 6.17 | 0.00 | 6.17 |
| New Zealand | Wood products | 2.70 | 2.09 | 3.42 | 0.00 | 3.42 |
| New Zealand | Dairy products | 0.08 | 0.85 | 1.33 | 5.71 | 7.12 |
| New Zealand | Motor vehicles and parts | 4.88 | 3.73 | 6.23 | 0.00 | 6.23 |
| New Zealand | Metals nec | 3.37 | 2.26 | 0.44 | 0.00 | 0.44 |
| New Zealand | Mineral products nec | 1.11 | 4.18 | 2.27 | 0.00 | 2.27 |
| New Zealand | Animal products nec | 0.21 | 2.43 | 0.36 | 0.00 | 0.36 |
| New Zealand | Crops nec | 0.93 | 1.40 | 0.45 | 0.00 | 0.45 |
| New Zealand | Food products nec | 2.66 | 4.83 | 1.56 | 0.00 | 1.56 |
| New Zealand | Oil | 12.74 | 3.90 | 0.00 | 0.00 | 0.00 |
| New Zealand | Machinery and equipment nec | 10.40 | 8.21 | 2.53 | 0.00 | 2.53 |
| New Zealand | Manufactures nec | 3.78 | 2.92 | 2.41 | 0.00 | 2.41 |
| New Zealand | Minerals nec | 1.46 | 1.92 | 0.00 | 0.00 | 0.00 |
| New Zealand | Meat products nec | 0.32 | 1.36 | 2.71 | 5.31 | 8.16 |
| New Zealand | Oil seeds | 0.23 | 0.60 | 0.00 | 0.00 | 0.00 |
| New Zealand | Transport equipment nec | 1.80 | 1.68 | 1.35 | 0.00 | 1.35 |
| New Zealand | Petroleum, coal products | 2.85 | 4.21 | 0.68 | 0.00 | 0.68 |
| New Zealand | Processed rice | 0.05 | 1.16 | 0.00 | 0.00 | 0.00 |
| New Zealand | Paddy rice | 0.01 | 0.90 | 0.00 | 0.00 | 0.00 |
| New Zealand | Plant-based fibers | 0.08 | 0.35 | 0.00 | 0.00 | 0.00 |
| New Zealand | Paper products, publishing | 1.09 | 3.19 | 1.60 | 0.00 | 1.60 |
| New Zealand | Sugar | 0.15 | 0.78 | 0.00 | 0.00 | 0.00 |
| New Zealand | Textiles | 4.97 | 5.18 | 5.93 | 0.00 | 5.93 |
| New Zealand | Vegetables, fruit, nuts | 1.07 | 3.96 | 0.07 | 0.00 | 0.07 |
| New Zealand | Vegetable oils and fats | 0.50 | 0.76 | 0.40 | 0.00 | 0.40 |
| New Zealand | Wearing apparel | 6.43 | 2.73 | 11.58 | 0.00 | 11.58 |
| New Zealand | Wheat | 0.05 | 0.81 | 0.00 | 0.00 | 0.00 |
| New Zealand | Wool, silk-worm cocoons | 0.02 | 0.17 | 0.00 | 0.00 | 0.00 |
| Norway | Beverages and tobacco products | 0.44 | 2.83 | 22.33 | 0.00 | 22.33 |

| Country name | Product name | Tariffs[1] (%) | MAcMap weight (%) | Production weight (%) | Tariff equivalent of subsidies (%) | Tariffs & subsidies (%) |
|---|---|---|---|---|---|---|
| Norway | Sugar cane, sugar beet | 0.00 | 0.19 | 137.51 | 0.00 | 137.51 |
| Norway | Bovine meat products | 0.09 | 0.89 | 222.73 | 19.28 | 284.94 |
| Norway | Coal | 0.55 | 0.56 | 0.00 | 0.00 | 0.00 |
| Norway | Chemical, rubber, plastic products | 6.15 | 9.33 | 0.10 | 0.00 | 0.10 |
| Norway | Bovine cattle, sheep and goats, horses | 0.06 | 0.88 | 106.20 | 0.00 | 106.20 |
| Norway | Electronic equipment | 19.88 | 6.20 | 0.00 | 0.00 | 0.00 |
| Norway | Electricity | 0.09 | 2.56 | 0.00 | 0.00 | 0.00 |
| Norway | Metal products | 1.86 | 2.87 | 0.03 | 0.00 | 0.03 |
| Norway | Forestry | 0.21 | 0.86 | 0.46 | 0.00 | 0.46 |
| Norway | Fishing | 0.22 | 0.97 | 0.36 | 0.00 | 0.36 |
| Norway | Gas | 1.89 | 0.97 | 0.00 | 0.00 | 0.00 |
| Norway | Gas manufacture, distribution | 0.00 | 0.15 | 0.00 | 0.00 | 0.00 |
| Norway | Cereal grains nec | 0.10 | 0.78 | 114.80 | 19.53 | 156.75 |
| Norway | Ferrous metals | 2.01 | 3.51 | 0.00 | 0.00 | 0.00 |
| Norway | Leather products | 2.53 | 1.55 | 2.70 | 0.00 | 2.70 |
| Norway | Wood products | 2.69 | 2.04 | 0.01 | 0.00 | 0.01 |
| Norway | Dairy products | 0.08 | 0.83 | 134.00 | 20.65 | 182.33 |
| Norway | Motor vehicles and parts | 4.87 | 3.63 | 0.00 | 0.00 | 0.00 |
| Norway | Metals nec | 3.37 | 2.20 | 0.02 | 0.00 | 0.02 |
| Norway | Mineral products nec | 1.11 | 4.07 | 0.00 | 0.00 | 0.00 |
| Norway | Animal products nec | 0.21 | 2.37 | 88.10 | 0.00 | 88.10 |
| Norway | Crops nec | 0.93 | 1.36 | 9.49 | 0.00 | 9.49 |
| Norway | Food products nec | 2.66 | 4.70 | 29.00 | 0.00 | 29.00 |
| Norway | Oil | 12.73 | 3.80 | 0.00 | 0.00 | 0.00 |
| Norway | Machinery and equipment nec | 10.40 | 8.00 | 0.01 | 0.00 | 0.01 |
| Norway | Manufactures nec | 3.78 | 2.85 | 0.03 | 0.00 | 0.03 |
| Norway | Minerals nec | 1.46 | 1.88 | 0.00 | 0.00 | 0.00 |
| Norway | Meat products nec | 0.32 | 1.33 | 224.28 | 2.45 | 232.22 |
| Norway | Oil seeds | 0.23 | 0.59 | 48.60 | 0.00 | 48.60 |
| Norway | Transport equipment nec | 1.79 | 1.64 | 0.04 | 0.00 | 0.04 |
| Norway | Petroleum, coal products | 2.84 | 4.11 | 0.00 | 0.00 | 0.00 |
| Norway | Processed rice | 0.05 | 1.13 | 27.06 | 0.00 | 27.06 |
| Norway | Paddy rice | 0.01 | 0.87 | 31.75 | 0.00 | 31.75 |
| Norway | Plant-based fibers | 0.08 | 0.34 | 0.00 | 0.00 | 0.00 |
| Norway | Paper products, publishing | 1.09 | 3.10 | 0.00 | 0.00 | 0.00 |
| Norway | Sugar | 0.15 | 0.76 | 56.58 | 0.00 | 56.58 |
| Norway | Textiles | 4.97 | 5.05 | 4.07 | 0.00 | 4.07 |
| Norway | Vegetables, fruit, nuts | 1.07 | 3.86 | 19.95 | 0.00 | 19.95 |
| Norway | Vegetable oils and fats | 0.50 | 0.74 | 49.05 | 0.00 | 49.05 |
| Norway | Wearing apparel | 6.43 | 2.66 | 3.85 | 0.00 | 3.85 |
| Norway | Wheat | 0.05 | 0.79 | 208.40 | 9.54 | 237.82 |
| Norway | Wool, silk-worm cocoons | 0.02 | 0.17 | 0.00 | 21.53 | 21.53 |
| Switzerland | Beverages and tobacco products | 0.44 | 2.83 | 16.22 | 0.00 | 16.22 |
| Switzerland | Sugar cane, sugar beet | 0.00 | 0.19 | 7.32 | 0.00 | 7.32 |
| Switzerland | Bovine meat products | 0.09 | 0.89 | 168.16 | 13.72 | 204.95 |
| Switzerland | Coal | 0.55 | 0.56 | 0.49 | 0.00 | 0.49 |
| Switzerland | Chemical, rubber, plastic products | 6.15 | 9.33 | 1.03 | 0.00 | 1.03 |
| Switzerland | Bovine cattle, sheep and goats, horses | 0.06 | 0.88 | 4.10 | 0.00 | 4.10 |
| Switzerland | Electronic equipment | 19.88 | 6.20 | 0.43 | 0.00 | 0.43 |
| Switzerland | Electricity | 0.09 | 2.56 | 0.00 | 0.00 | 0.00 |
| Switzerland | Metal products | 1.86 | 2.87 | 1.18 | 0.00 | 1.18 |
| Switzerland | Forestry | 0.21 | 0.86 | 0.59 | 0.00 | 0.59 |
| Switzerland | Fishing | 0.22 | 0.97 | 0.11 | 0.00 | 0.11 |
| Switzerland | Gas | 1.89 | 0.97 | 0.00 | 0.00 | 0.00 |
| Switzerland | Gas manufacture, distribution | 0.00 | 0.15 | 0.01 | 0.00 | 0.01 |

| Country name | Product name | Tariffs[1] (%) | MAcMap weight (%) | Production weight (%) | Tariff equivalent of subsidies (%) | Tariffs & subsidies (%) |
|---|---|---|---|---|---|---|
| Switzerland | Cereal grains nec | 0.10 | 0.78 | 77.72 | 12.24 | 99.46 |
| Switzerland | Ferrous metals | 2.01 | 3.51 | 0.95 | 0.00 | 0.95 |
| Switzerland | Leather products | 2.53 | 1.55 | 1.06 | 0.00 | 1.06 |
| Switzerland | Wood products | 2.69 | 2.04 | 1.37 | 0.00 | 1.37 |
| Switzerland | Dairy products | 0.08 | 0.83 | 106.84 | 20.30 | 148.82 |
| Switzerland | Motor vehicles and parts | 4.87 | 3.63 | 1.23 | 0.00 | 1.23 |
| Switzerland | Metals nec | 3.37 | 2.20 | 0.70 | 0.00 | 0.70 |
| Switzerland | Mineral products nec | 1.11 | 4.07 | 1.94 | 0.00 | 1.94 |
| Switzerland | Animal products nec | 0.21 | 2.37 | 7.65 | 0.00 | 7.65 |
| Switzerland | Crops nec | 0.93 | 1.36 | 8.18 | 0.00 | 8.18 |
| Switzerland | Food products nec | 2.66 | 4.70 | 14.02 | 0.00 | 14.02 |
| Switzerland | Oil | 12.73 | 3.80 | 0.00 | 0.00 | 0.00 |
| Switzerland | Machinery and equipment nec | 10.40 | 8.00 | 0.74 | 0.00 | 0.74 |
| Switzerland | Manufactures nec | 3.78 | 2.85 | 22.70 | 0.00 | 22.70 |
| Switzerland | Minerals nec | 1.46 | 1.88 | 3.58 | 0.00 | 3.58 |
| Switzerland | Meat products nec | 0.32 | 1.33 | 111.32 | 6.19 | 124.40 |
| Switzerland | Oil seeds | 0.23 | 0.59 | 21.20 | 16.38 | 41.04 |
| Switzerland | Transport equipment nec | 1.79 | 1.64 | 0.72 | 0.00 | 0.72 |
| Switzerland | Petroleum, coal products | 2.84 | 4.11 | 0.02 | 0.00 | 0.02 |
| Switzerland | Processed rice | 0.05 | 1.13 | 7.11 | 0.00 | 7.11 |
| Switzerland | Paddy rice | 0.01 | 0.87 | 5.84 | 0.00 | 5.84 |
| Switzerland | Plant-based fibers | 0.08 | 0.34 | 0.00 | 0.00 | 0.00 |
| Switzerland | Paper products, publishing | 1.09 | 3.10 | 2.51 | 0.00 | 2.51 |
| Switzerland | Sugar | 0.15 | 0.76 | 100.89 | 6.28 | 113.52 |
| Switzerland | Textiles | 4.97 | 5.05 | 5.25 | 0.00 | 5.25 |
| Switzerland | Vegetables, fruit, nuts | 1.07 | 3.86 | 30.55 | 0.00 | 30.55 |
| Switzerland | Vegetable oils and fats | 0.50 | 0.74 | 26.55 | 0.00 | 26.55 |
| Switzerland | Wearing apparel | 6.43 | 2.66 | 4.55 | 0.00 | 4.55 |
| Switzerland | Wheat | 0.05 | 0.79 | 131.60 | 11.28 | 157.73 |
| Switzerland | Wool, silk-worm cocoons | 0.02 | 0.17 | 0.00 | 0.00 | 0.00 |
| United States | Beverages and tobacco products | 0.44 | 2.83 | 2.67 | 0.00 | 2.67 |
| United States | Sugar cane, sugar beet | 0.00 | 0.19 | 0.25 | 0.00 | 0.25 |
| United States | Bovine meat products | 0.09 | 0.89 | 2.59 | 7.20 | 9.98 |
| United States | Coal | 0.55 | 0.56 | 0.00 | 0.00 | 0.00 |
| United States | Chemical, rubber, plastic products | 6.15 | 9.33 | 2.15 | 0.00 | 2.15 |
| United States | Bovine cattle, sheep and goats, horses | 0.06 | 0.88 | 0.11 | 0.00 | 0.11 |
| United States | Electronic equipment | 19.88 | 6.20 | 0.43 | 0.00 | 0.43 |
| United States | Electricity | 0.09 | 2.56 | 0.00 | 0.00 | 0.00 |
| United States | Metal products | 1.86 | 2.87 | 1.75 | 0.00 | 1.75 |
| United States | Forestry | 0.21 | 0.86 | 0.16 | 0.00 | 0.16 |
| United States | Fishing | 0.22 | 0.97 | 0.28 | 0.00 | 0.28 |
| United States | Gas | 1.89 | 0.97 | 0.00 | 0.00 | 0.00 |
| United States | Gas manufacture, distribution | 0.00 | 0.15 | 0.00 | 0.00 | 0.00 |
| United States | Cereal grains nec | 0.10 | 0.78 | 0.88 | 20.07 | 21.13 |
| United States | Ferrous metals | 2.01 | 3.51 | 1.21 | 0.00 | 1.21 |
| United States | Leather products | 2.53 | 1.55 | 9.80 | 0.00 | 9.80 |
| United States | Wood products | 2.69 | 2.04 | 0.61 | 0.00 | 0.61 |
| United States | Dairy products | 0.08 | 0.83 | 16.67 | 11.90 | 30.55 |
| United States | Motor vehicles and parts | 4.87 | 3.63 | 2.28 | 0.00 | 2.28 |
| United States | Metals nec | 3.37 | 2.20 | 1.01 | 0.00 | 1.01 |
| United States | Mineral products nec | 1.11 | 4.07 | 3.59 | 0.00 | 3.59 |
| United States | Animal products nec | 0.21 | 2.37 | 0.44 | 0.00 | 0.44 |
| United States | Crops nec | 0.93 | 1.36 | 2.71 | 0.00 | 2.71 |
| United States | Food products nec | 2.66 | 4.70 | 3.13 | 0.00 | 3.13 |
| United States | Oil | 12.73 | 3.80 | 0.00 | 0.00 | 0.00 |

| Country name | Product name | Tariffs[1] (%) | MAcMap weight (%) | Production weight (%) | Tariff equivalent of subsidies (%) | Tariffs & subsidies (%) |
|---|---|---|---|---|---|---|
| United States | Machinery and equipment nec | 10.40 | 8.00 | 1.38 | 0.00 | 1.38 |
| United States | Manufactures nec | 3.78 | 2.85 | 1.60 | 0.00 | 1.60 |
| United States | Minerals nec | 1.46 | 1.88 | 0.09 | 0.00 | 0.09 |
| United States | Meat products nec | 0.32 | 1.33 | 3.35 | 9.03 | 12.68 |
| United States | Oil seeds | 0.23 | 0.59 | 8.71 | 20.48 | 30.97 |
| United States | Transport equipment nec | 1.79 | 1.64 | 1.05 | 0.00 | 1.05 |
| United States | Petroleum, coal products | 2.84 | 4.11 | 1.02 | 0.00 | 1.02 |
| United States | Processed rice | 0.05 | 1.13 | 5.21 | 20.50 | 26.78 |
| United States | Paddy rice | 0.01 | 0.87 | 5.19 | 20.50 | 26.76 |
| United States | Plant-based fibers | 0.08 | 0.34 | 0.99 | 0.00 | 0.99 |
| United States | Paper products, publishing | 1.09 | 3.10 | 0.18 | 0.00 | 0.18 |
| United States | Sugar | 0.15 | 0.76 | 24.22 | 4.78 | 30.16 |
| United States | Textiles | 4.97 | 5.05 | 9.81 | 0.00 | 9.81 |
| United States | Vegetables, fruit, nuts | 1.07 | 3.86 | 4.98 | 12.98 | 18.61 |
| United States | Vegetable oils and fats | 0.50 | 0.74 | 2.98 | 0.00 | 2.98 |
| United States | Wearing apparel | 6.43 | 2.66 | 11.27 | 0.00 | 11.27 |
| United States | Wheat | 0.05 | 0.79 | 3.19 | 21.05 | 24.91 |
| United States | Wool, silk-worm cocoons | 0.02 | 0.17 | 1.62 | 4.82 | 6.51 |

[1] MAcMap values aggregated across HS 6 lines by MAcMap weights and across exporters by exporter's GDP.

**Table A–2. Computation of *ad valorem* tariff equivalents of agricultural subsidies by importer and product group**

| Country | Product | A. Production (farm gate prices) | B. Consumption (farm gate prices) | C. Border measures *ad valorem* equivalent | D. Imports | E. Exports | F. Trade-distorting subsidies | G. Subsidy rate (F / A) | H. Apparent consumption (A/(1+C)+ D–E) | J. Import share of consumption (D / H) | Import price elasticity ($\sigma_D \times (1–J)$)[1] | Tariff equivalent of subsidies[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (million $) | | (%) | (million $) | | | (%) | (million $) | (%) | | (%) |
| Australia | Beef & sheepmeat | 4,391 | 1,479 | 0.00 | 4 | 3,220 | 0 | 133 | 3.04 | 1,175 | 0.38 | 358.64 |
| Australia | Corn & other grains | 1,656 | 1,514 | 0.00 | 5 | 485 | 0 | 26 | 1.54 | 1,176 | 0.42 | 358.50 |
| Australia | Dairy, eggs | 1,928 | 988 | 0.92 | 185 | 1,494 | 0 | 200 | 10.39 | 602 | 30.76 | 249.27 |
| Australia | Oil seeds | 598 | 131 | 0.81 | 32 | 71 | 0 | 9 | 1.46 | 555 | 5.77 | 339.22 |
| Australia | Pork, poultry, other meat | 1,152 | 1,101 | 0.75 | 142 | 292 | 0 | 33 | 2.87 | 994 | 14.30 | 308.54 |
| Australia | Rice | 236 | 170 | 0.00 | 30 | 41 | 2 | 9 | 3.94 | 226 | 13.47 | 311.50 |
| Australia | Sugar | 551 | 137 | 10.05 | 5 | 39 | 0 | 49 | 8.96 | 467 | 1.13 | 355.95 |
| Australia | Vegetables, fruit, nuts | 8 | 12 | 0.81 | 201 | 674 | 0 | | | –466 | –43.15 | 515.35 |
| Australia | Wheat | 1,615 | 491 | 0.00 | 17 | 1,913 | 0 | 58 | 3.57 | –281 | –5.99 | 381.56 |
| Australia | Wool | 1,640 | 75 | 0.16 | 5 | 1,263 | 0 | 52 | 3.19 | 380 | 1.21 | 355.63 |
| Canada | Beef & sheepmeat | 4,303 | 2,867 | 8.40 | 610 | 1,424 | 8 | 298 | 6.92 | 3,156 | 19.34 | 290.36 |
| Canada | Corn & other grains | 2,392 | 2,444 | 0.32 | 439 | 398 | 0 | 311 | 13.02 | 2,426 | 18.11 | 294.80 |
| Canada | Dairy, eggs | 3,266 | 3,480 | 97.69 | 307 | 252 | –1 | 56 | 1.72 | 1,708 | 18.00 | 295.21 |
| Canada | Oil seeds | 2,760 | 1,753 | 0.00 | 252 | 484 | 0 | 270 | 9.79 | 2,528 | 9.95 | 324.17 |
| Canada | Pork, poultry, other meat | 3,581 | 2,249 | 39.48 | 615 | 1,616 | –4 | 106 | 2.95 | 1,566 | 39.25 | 218.70 |
| Canada | Rice | | | 0.00 | 99 | 1 | | | | | | |
| Canada | Sugar | | | 4.46 | 249 | 118 | | | | | | |
| Canada | Vegetables, fruit, nuts | 435 | 461 | 1.76 | 2,774 | 1,213 | 0 | 60 | 13.68 | 1,988 | 139.53 | – 142.31 |
| Canada | Wheat | 1,836 | 753 | 2.57 | 12 | 1,990 | 29 | 292 | 15.93 | –188 | –6.45 | 383.22 |
| Canada | Wool | | | 0.00 | 0 | 2 | | | | | | |
| EU-15 | Beef & sheepmeat | 21,562 | 22,379 | 75.79 | 2,216 | 849 | 468 | 12,939 | 60.01 | 13,633 | 16.26 | 301.48 |
| EU-15 | Corn & other grains | 27,107 | 25,887 | 17.25 | 920 | 810 | 59 | 21,634 | 79.81 | 23,229 | 3.96 | 345.73 |
| EU-15 | Dairy, eggs | 43,127 | 41,160 | 38.02 | 1,374 | 5,163 | 642 | 2,478 | 5.75 | 27,458 | 5.00 | 341.99 |
| EU-15 | Oil seeds | 6,349 | 11,818 | 0.00 | 5,658 | 106 | 0 | 3,540 | 55.75 | 11,902 | 47.54 | 188.85 |
| EU-15 | Pork, poultry, other meat | 32,899 | 30,630 | 15.24 | 1,952 | 3,413 | 312 | 1,500 | 4.56 | 27,088 | 7.21 | 334.06 |
| EU-15 | Rice | 1,474 | 1,546 | 110.81 | 168 | 139 | 2 | 276 | 18.74 | 727 | 23.03 | 277.09 |
| EU-15 | Sugar | 5,258 | 4,565 | 90.37 | 1,406 | 1,067 | 85 | 290 | 5.52 | 3,100 | 45.34 | 196.78 |
| EU-15 | Vegetables, fruit, nuts | 6,673 | 10,691 | 19.12 | 12,212 | 3,605 | –112 | 183 | 2.74 | 14,208 | 85.95 | 50.59 |
| EU-15 | Wheat | 13,099 | 11,709 | 0.67 | 1,436 | 1,370 | 12 | 11,808 | 90.15 | 13,078 | 10.98 | 320.47 |
| EU-15 | Wool | | | 0.00 | 693 | 93 | | | | | | |
| Japan | Beef & sheepmeat | 4,110 | 10,652 | 38.22 | 2,428 | 2 | 0 | 271 | 6.60 | 5,400 | 44.97 | 198.11 |
| Japan | Corn & other grains | 446 | 4,919 | 53.18 | 2,722 | 0 | 0 | 62 | 13.91 | 3,013 | 90.33 | 34.80 |
| Japan | Dairy, eggs | 8,407 | 11,208 | 82.44 | 874 | 11 | 0 | 486 | 5.78 | 5,472 | 15.98 | 302.48 |
| Japan | Oil seeds | 225 | 4,342 | 1.62 | 1,573 | 1 | 0 | 245 | 108.57 | 1,793 | 87.69 | 44.33 |
| Japan | Pork, poultry, other meat | 5,674 | 9,224 | 36.55 | 5,867 | 18 | 0 | 68 | 1.20 | 10,005 | 58.65 | 148.87 |
| Japan | Rice | 31,437 | 35,141 | 886.73 | 231 | 6 | 0 | 2,974 | 9.46 | 3,410 | 6.76 | 335.67 |
| Japan | Sugar | 765 | 2,325 | 227.02 | 310 | 1 | 0 | 41 | 5.36 | 543 | 57.17 | 154.20 |
| Japan | Vegetables, fruit, nuts | 8,954 | 13,948 | 21.41 | 2,543 | 62 | –105 | 147 | 1.64 | 9,856 | 25.80 | 267.10 |
| Japan | Wheat | 931 | 2,217 | 214.41 | 1,108 | 0 | 0 | 127 | 13.63 | 1,404 | 78.90 | 75.96 |

| Country | Product | A. Production (farm gate prices) | B. Consumption (farm gate prices) | C. Border measures *ad valorem* equivalent | D. Imports | E. Exports | F. Trade-distorting subsidies | G. Subsidy rate (F / A) | H. Apparent consumption (A/(1+C)+ D–E) | J. Import share of consumption (D / H) | Import price elasticity ($\sigma_D$ × (1–J))[1] | Tariff equivalent of subsidies[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Japan | Wool | | | 1.15 | 3 | 0 | | | | | | |
| N. Zealand | Beef & sheepmeat | 1,889 | 333 | 0.04 | 26 | 2,141 | 0 | 9 | 0.46 | –227 | –11.24 | 400.47 |
| N. Zealand | Corn & other grains | 133 | 146 | 0.00 | 8 | 1 | 0 | 0 | 0.00 | 140 | 5.96 | 338.53 |
| N. Zealand | Dairy, eggs | 2,526 | 316 | 1.33 | 37 | 2,797 | 0 | 13 | 0.52 | –266 | –14.07 | 410.66 |
| N. Zealand | Oil seeds | | | 0.00 | 5 | 1 | | | | | | |
| N. Zealand | Pork, poultry, other meat | 220 | 237 | 2.71 | 56 | 167 | 4 | 6 | 2.62 | 103 | 54.22 | 164.82 |
| N. Zealand | Rice | | | 0.00 | 19 | 0 | | | | | | |
| N. Zealand | Sugar | | | 0.00 | 52 | 8 | | | | | | |
| N. Zealand | Vegetables, fruit, nuts | | | 0.07 | 136 | 685 | | | | | | |
| N. Zealand | Wheat | 48 | 78 | 0.00 | 51 | 0 | 0 | 0 | 0.00 | 99 | 51.21 | 175.64 |
| N. Zealand | Wool | 316 | 45 | 0.00 | 0 | 130 | 0 | 0 | 0.00 | 186 | 0.14 | 359.50 |
| Norway | Beef & sheepmeat | 401 | 428 | 222.73 | 33 | 3 | –23 | 382 | 95.15 | 155 | 21.35 | 283.14 |
| Norway | Corn & other grains | 402 | 406 | 114.80 | 16 | 0 | –1 | 222 | 55.12 | 203 | 7.82 | 331.86 |
| Norway | Dairy, eggs | 742 | 679 | 134.00 | 40 | 84 | –8 | 607 | 81.76 | 274 | 14.74 | 306.92 |
| Norway | Oil seeds | | | 48.60 | 114 | 0 | | | | | | |
| Norway | Pork, poultry, other meat | 368 | 376 | 224.28 | 133 | 56 | –33 | 12 | 3.30 | 190 | 69.85 | 108.55 |
| Norway | Rice | | | 29.11 | 11 | 0 | | | | | | |
| Norway | Sugar | | | 56.58 | 62 | 0 | | | | | | |
| Norway | Vegetables, fruit, nuts | | | 19.95 | 440 | 3 | | | | | | |
| Norway | Wheat | 76 | 104 | 208.40 | 44 | 0 | –1 | 26 | 34.25 | 69 | 64.19 | 128.90 |
| Norway | Wool | 17 | 6 | 0.00 | 1 | 5 | 0 | 48 | 282.98 | 13 | 4.16 | 345.02 |
| Switzerland | Beef & sheepmeat | 705 | 784 | 168.16 | 149 | 4 | –5 | 294 | 41.66 | 408 | 36.45 | 228.79 |
| Switzerland | Corn & other grains | 122 | 233 | 77.72 | 41 | 1 | 0 | 41 | 33.40 | 108 | 37.46 | 225.16 |
| Switzerland | Dairy, eggs | 1,677 | 1,715 | 106.84 | 240 | 394 | 25 | 816 | 48.67 | 656 | 36.53 | 228.50 |
| Switzerland | Oil seeds | 39 | 221 | 21.20 | 29 | 1 | 0 | 31 | 79.82 | 61 | 48.17 | 186.59 |
| Switzerland | Pork, poultry, other meat | 826 | 959 | 111.32 | 315 | 17 | –47 | 107 | 12.95 | 689 | 45.71 | 195.45 |
| Switzerland | Rice | | | 6.56 | 22 | 0 | | | | | | |
| Switzerland | Sugar | 96 | 200 | 100.89 | 64 | 3 | 0 | 16 | 16.22 | 109 | 59.23 | 146.77 |
| Switzerland | Vegetables, fruit, nuts | | | 30.55 | 910 | 4 | | | | | | |
| Switzerland | Wheat | 171 | 335 | 131.60 | 64 | 0 | 0 | 59 | 34.60 | 137 | 46.41 | 192.91 |
| Switzerland | Wool | | | 0.00 | 1 | 1 | | | | | | |
| U.S. | Beef & sheepmeat | 33,463 | 35,915 | 2.59 | 2,984 | 3,849 | 0 | 1,080 | 3.23 | 31,753 | 9.40 | 326.17 |
| U.S. | Corn & other grains | 24,958 | 20,275 | 0.88 | 467 | 5,790 | 0 | 5,197 | 20.83 | 19,417 | 2.41 | 351.34 |
| U.S. | Dairy, eggs | 27,022 | 26,744 | 16.67 | 1,477 | 761 | 0 | 1,565 | 5.79 | 23,877 | 6.19 | 337.73 |
| U.S. | Oil seeds | 15,280 | 9,822 | 8.71 | 228 | 7,149 | 0 | 3,190 | 20.88 | 7,135 | 3.20 | 348.48 |
| U.S. | Pork, poultry, other meat | 27,270 | 24,330 | 3.35 | 1,583 | 3,871 | 2 | 861 | 3.16 | 24,100 | 6.57 | 336.35 |
| U.S. | Rice | 2,146 | 1,261 | 5.20 | 197 | 534 | 0 | 1,515 | 70.58 | 1,703 | 11.55 | 318.43 |
| U.S. | Sugar | 2,115 | 3,581 | 24.22 | 810 | 98 | –8 | 144 | 6.82 | 2,415 | 33.56 | 239.19 |
| U.S. | Vegetables, fruit, nuts | 15,214 | 9,852 | 4.98 | 8,179 | 6,713 | 0 | 3,272 | 21.51 | 15,957 | 51.25 | 175.49 |
| U.S. | Wheat | 6,391 | 3,885 | 3.19 | 213 | 3,804 | 0 | 2,161 | 33.81 | 2,603 | 8.19 | 330.50 |
| U.S. | Wool | 21 | 23 | 1.62 | 24 | 18 | 0 | 1 | 2.57 | 28 | 87.46 | 45.13 |

[1]Where $\sigma_D$ is the elasticity of substitution in demand between domestic goods and imports, assumed to be 3.6. See Cline (2004, ch. 3).

**References**


Anderson, James E., and J. Peter Neary, 1994, "Measuring the Restrictiveness of Trade Policy," *World Bank Economic Review*, vol. 8, pp.151-69.

——, 1996, "A New Approach to Evaluating Trade Policy," *Review of Economic Studies* 63 (1), pp. 107–25.

——, 2003. "The Mercantilist Index of Trade Policy," *International Economic Review* 44 (2), pp. 627–49.

Basevi, Giorgio, "Aggregation Problems in the Measurement of Effective Protection," in Herbert G. Grubel and Harry G. Johnson, *Effective Tariff Protection* (Geneva: General Agreement on Tariffs and Trade and Graduate Institute of International Studies, 1971), pp. 115–34.

Bouët, Antoine, et al., 2004, "Computing an exhaustive and consistent, ad-valorem equivalent measure of applied protection: a detailed description of MAcMap-HS6 methodology," 2nd ed., Paris, Centre d'Etudes Prospectives et d'Informations Internationales, June.

Cline, William R., 2002, "An Index of Industrial Country Trade Policy toward Developing Countries," Working Paper 14, Center for Global Development, Washington, DC, October.

——, 2004, *Trade Policy and Global Poverty*, Center for Global Development and Institute for International Economics, Washington, DC.

Cooper, Richard N., "Tariff Dispersion and Trade Negotiations," *Journal of Political Economy* 72 (6), pp. 597–603.

Corden, Warner M., "The Effective Protection Rate, the Uniform Tariff Equivalent and the Average Tariff," *Economic Record*, June 1966.

Dimaranan, Betina V., and Robert A. McDougall, eds., 2002, *Global Trade, Assistance, and Production: The GTAP5 Data Base*, Center for Global Trade Analysis, Purdue University, West Lafayette, IN.

Francois, Joseph, and Dean Spinanger, 2004, "Liberalizing Quotas on Textiles and Clothing: Has the ATC Actually Worked?" draft, June.

de Gorter, Harry, Melinda Ingco, and Laura Ignacio, 2003, "Domestic Support for Agriculture: Agricultural Policy Reform and Developing Countries," *Trade Note* 7, World Bank, September.

International Monetary Fund (IMF), 2005, "Review of the IMF's Trade Restrictiveness Index," Policy Development and Review Department, Washington, DC, February 14.

Kee, Hiau Looi, Alessandro Nicita, and Marcelo Olarreaga, 2004, "Import Demand Elasticities and Trade Distortions," Policy Research Working Paper 3452, World Bank, Washington, DC.

——, "Estimating Trade Restrictiveness Indices," Policy Research Working Paper 3840, World Bank, Washington, DC.

Organisation for Economic Co-operation and Development, 1997, *Indicators of Tariff and Non-Tariff Trade Barriers*, Paris.

——, 2004, *Producer and Consumer Support Estimates: OECD Database, 1986–2003*, Paris.

Roodman, David, 2006a, "The Commitment to Development Index: 2006 Edition," Center for Global Development, Washington, DC, August.

——, 2006b, "An Index of Donor Performance," Center for Global Development, Washington, DC, August.