

## Methodology for Developing Tariff Profiles

Countries levy tariffs in a number of different, and sometimes complex, forms. Most tariffs are expressed in “ad valorem” terms, or as a percentage of the value of the imported good. However, a significant portion is expressed in specific, or other non-ad valorem terms (see box, *Tariff Formats Conceal High Levels of Protection*). Agriculture is somewhat unique in the extent to which non-ad valorem tariffs are still used. In the United States and the EU, for example, approximately 44 percent of agricultural tariff-lines (categories of products with tariffs) are specified in non-ad valorem terms. There are a number of reasons for this, including the increased protection that a non-ad valorem tax can provide against large drops in import prices and the lack of transparency associated with these rates, which helps conceal the level of protection being provided.

Tariffs are bound at the tariff-line level, which refers to the category to which the legally established tariff applies. The complexity of many schedules and the lack of transparency associated with this complexity make it very difficult to compare tariffs across countries or across commodity markets. The challenge in making the comparisons is to transform the data to a common basis and then develop measures to summarize the thousands of tariff-lines that can make up a schedule. This section describes the conceptual approach used to develop meaningful tariff profiles for each country. The steps are presented following the same process we used to transform the tariff-lines into statistics that characterize each country’s tariff schedule. Appendix A provides technical details on these calculations.

### *Calculation of Tariff Ad Valorem Equivalents*

The first step in developing tariff profiles is to calculate an ad valorem equivalent (AVE) for each non-ad valorem tariff. Unfortunately, no single AVE exists for non-ad valorem tariffs, as the calculated value depends on the choice of import price and exchange rate, both of which can change over time. The import price should approximate the declared value against which the ad valorem tariff would have been charged. Domestic prices overstate this value because they have been inflated by the tariff, while the country-specific import unit values reflect preferential import conditions and, thus, can be out of line with representative world prices and vary widely across countries (Lind-

### Tariff Formats Conceal High Levels of Protection

Countries levy tariffs in a number of different ways:

- As a percentage of the value of imports (ad valorem tariffs)
- As a monetary amount per unit of import such as cents per liter (specific tariffs)
- As a combination of the two, such as 12.5 percent plus 2 cents per liter (compound tariffs)

Other factors can further complicate compound tariffs, including appending a threshold, such as, *but not less than 15 cents per liter or greater than 25 cents per liter*. In this case, either the ad valorem or the specific portion of the tariff can be binding. Tariffs may also vary based on the time of year (seasonal tariffs) or be determined by complex technical factors (such as sugar or alcohol content).

One of the main rationales for specific duties is their administrative simplicity, since they avoid the problem of having to value imports. Defenders of specific tariffs have argued that ad valorem rates give an incentive to importers to underinvoice, since the size of the duty depends on the price of the import. Supporters of ad valorem rates have countered that specific duties place a heavier burden on lower priced items within a given tariff-line and are therefore a regressive tax on consumers. In addition, they point to the lack of transparency associated with specific duties, since the ad valorem equivalent is often difficult to determine (Irwin).

Since calculating AVEs takes considerable time and effort, and since the data needed to perform such calculations are often not available, non-ad valorem tariffs for agriculture are often excluded from calculations of average tariffs. This can result in an average that is underestimated, since the AVE of these tariffs tends to be quite high. Based on the AVEs calculated in this study, non-ad valorem tariffs appear to provide significantly higher tariff protection than ad valorem tariffs. The average of bound tariffs specified solely in ad valorem terms is 58 percent, while the average AVE of non-ad valorem tariffs is 123 percent.

land). In many cases, no country-specific import value even exists, particularly when tariffs are so high as to preclude any trade from taking place. Representative world prices also present a problem since they may not conform to the specific quality or variety of the commodity imported.

In this study, world import unit values were used as a proxy for import prices, since the global perspective corrects for individual country tariffs and represents the average quality or variety of the product in question. This approach also allowed us to calculate AVEs even when the country imported none of the commodity in question. Unfortunately, world import unit values present a drawback as well, since they are only available at the relatively aggregate levels. When countries have many disaggregated tariff-lines, using the world unit import value may underestimate the AVE for some of these tariffs and overestimate it for others.

One characteristic of fixed, specific tariffs is that they provide a level of protection inversely related to prices. Therefore, in a time of low prices, the level of protection provided by the tariff is higher than during a period of high prices. Likewise, when tariffs are denominated in domestic currencies while prices are in U.S. dollars, a depreciation in the exchange rate will result in a decrease in the AVE, even if the specific tariff and the dollar price have not changed. Thus, the AVE will vary based on the time period of the world import unit value used in the calculation. Prices used to calculate AVEs in this report are based on average world import unit values for 1995-97. To the extent that world import prices during this period reflect somewhat higher world prices than prevailed at other times, the AVE tariffs presented here will be lower than AVEs calculated during a period of lower prices, such as current prices.

### ***Country and Commodity Coverage***

In order to identify patterns in protection, the next step is to aggregate the tariffs for extremely narrowly defined products (a total of 91,000 tariffs across all countries) into broad country and commodity categories. The next section uses regional aggregations to provide a broad overview of the differences in tariff protection. Country coverage of the data used includes 129 of 140 WTO members.<sup>3</sup> Commodity or product groupings used in

<sup>3</sup> As of November 30, 2000, WTO membership totaled 140 countries or customs territories. Of this number, 16 are accounted for by the European Union; one each for the EU Commission and the 15 member states.

this report cover a broad range of agricultural products traded by both developed and developing countries. The commodity list used in this report covers most, but not all of the lines that fall under the WTO definition of agriculture (see Appendix).<sup>4</sup>

The most common way to aggregate tariffs, used in this study, is to calculate the simple, unweighted average. However, drawbacks are associated with a simple average. An unweighted average does not distinguish between “important” and “unimportant” tariffs. Since equal weight is given to all agricultural tariffs, a kumquat tariff is as important as a wheat tariff, if each enters as a single tariff-line item. The different levels of commodity aggregation found in each country’s tariff schedule present another drawback. For instance, in the category “dairy,” there are 27 tariff-lines for Australia, 75 for Canada, 183 for the United States, and 187 for the EU. If tariffs for these items are large (which they are), the higher the level of disaggregation, the greater the upward bias in the country average.

There are a number of alternative ways to average and aggregate tariffs across countries and commodities, none of which is without bias. Weighted averages are often calculated in an attempt to emphasize certain tariffs over others. Weighting based on import values, perhaps the most commonly used weighting scheme, may bias the average downward, because items with the highest tariffs will receive virtually no weight because little or no trade will take place under such tariffs. Weighting based on shares of domestic value of production would assure that highly protected commodities produced in large amounts get appropriately large weights, but this method can result in an upward bias, because many factors other than tariffs affect agricultural production levels. In addition, production data at the tariff-line level are rarely available. The share of the domestic value of consumption is another alternative, but biased to the extent that high tariffs reduce consumption. Similar to production, consumption data are generally not available at the tariff-line level. One alternative is to calculate a simple (unweighted) average aggregated to a level where data on appropriate production weights are available (the 4- or 6-digit HS level), as was done by the Organization for Economic Cooperation and Development (OECD) in a recent analysis (OECD, 1999). Ultimately, there is

<sup>4</sup> A detailed specification of commodity groupings is available from the authors ([pgibson@ers.usda.gov](mailto:pgibson@ers.usda.gov)).

## Tariff Data

A number of sources provide the bound and applied data used in this report. The primary source of bound tariffs is the Agricultural Market Access Database (AMAD). The AMAD is the most comprehensive collection of available public data on WTO market access, containing detailed data on WTO tariff and TRQ schedules, import data, applied tariffs, production, consumption, and trade, among other information. The AMAD contains data on about 40 WTO members, including all major agricultural trading members. AMAD data can be accessed through its website. Tariff bindings in this report for countries not included in the AMAD are from tariff bindings of the WTO Secretariat. These bindings are reproduced on the CD-ROM "Results of the Uruguay Round," WTO Secretariat. Additional data on applied tariffs is from the United Nations Conference on Trade and Development (UNCTAD) Trade Analysis and Information System (TRAINS) database. UNCTAD TRAINS contains a comprehensive collection of applied tariff data. Applied tariff data for developing countries for the years 1995-99 included in this analysis, as well as in the AMAD, are from the UNCTAD TRAINS database.

no ideal weighting scheme and the transparency of unweighted aggregations has some advantages.

### *Statistics To Characterize Tariff Profiles*

A critical component of this study is to determine appropriate statistical measures to characterize the level of tariff protection in each country or commodity sector. The two most commonly used measures are the arithmetic mean (or average) to capture the overall level of tariffs and the standard deviation to measure the spread or distance of most observations from the mean. While each is the most efficient measure for normal or bell-shaped distributions, arithmetic mean and standard deviation are not the most appropriate measure for highly skewed distributions.<sup>5</sup>

Tariff schedules sometimes have distributions that are highly skewed to the right, meaning that the tariffs

<sup>5</sup> When the word "mean" is used without a modifier, it refers to the arithmetic mean, or simple average.

continue much farther to the right of the mean than to the left. For these distributions, the mean may overestimate the central tendency of the data. The most common alternative measure is the tariff median, which measures the midpoint of the tariff schedule's distribution. If a country's tariff schedule is normally distributed, then the mean and median tariffs would be very close, and there would be no need to report more than one. But, when the tariff schedule is highly skewed, both the mean and median give useful information, although the median tariff might be considered a more "representative" measure for comparing the overall height of each country's regime, since it is less sensitive to a few extremely high rates.<sup>6</sup>

This report uses means and medians as the two statistics to characterize tariff distributions. While the relationship between the mean and median represents a continuum, four benchmark combinations are identified with associated economic interpretations.

*High mean/high median:* High levels of protection for a country or commodity sector found across most tariff-lines.

*High mean/low median:* Extremely high levels of protection for a few specific commodities result in high mean, although most tariff-lines are low. This suggests the need for more detailed analysis that breaks out countries and/or disaggregates commodities to understand nature of protection.

*Low mean/high median:* Extremely low levels of protection for a few specific commodities result in low mean, although most tariff-lines are high. This suggests the need for more detailed analysis that breaks out countries and/or disaggregates commodities to understand the nature of protection.

*Low mean/low median:* Low levels of protection for a country or commodity sector found across most tariff-lines.

Before applying these benchmarks to the data, definitions of high and low are required. The dividing lines are the global mean agricultural tariff equal to 62 percent and the global median tariff equal to 40 percent. In parts of the analysis, tariffs for a specific

<sup>6</sup> This report does not provide a direct measure of the spread or dispersion of the data such as the standard deviation. A comparison of the mean and median provides some information about the dispersion and also indicates the influence of megatariffs.

commodity and country are also compared with regional or commodity mean and median tariffs.

This study also identifies markets subject to extremely high tariffs. This is important because these are markets where tariffs could be significantly reduced without actually improving market access. No internationally accepted definition exists to categorize these “megatariffs.” In this report, tariffs equal to or above

100 percent qualify as megatariffs. Another term for megatariffs used in this study is “international tariff peaks,” or those tariff-lines that exceed some common yardstick.<sup>7</sup>

<sup>7</sup> The WTO often uses the term “international tariff peaks” to refer to tariffs above 15 percent. This definition has generally been used when examining tariffs on imports of manufactures. For agricultural tariffs, however, defining international peaks as tariffs equal to or above 100 percent has more meaning.

### Bound Tariffs, TRQ Tariffs, and Applied Tariffs: What’s the Difference?

The levels of tariff protection profiled in this report refer to Most Favored Nation (MFN) bound tariffs. Tariff rates on trade under regional or preferential trade provisions, such as North American Free Trade Agreement (NAFTA) or Generalized System of Preferences (GSP), are not considered.

**Bound** MFN tariffs are tariff commitments scheduled by WTO members and are generally considered the maximum allowable tariffs that a member may levy on imports. The establishment of bound tariff rates on agricultural trade among WTO members was a major accomplishment of the Uruguay Round. Under WTO rules, application of tariffs above bound rates generally requires that compensation be offered to trading partners adversely affected by an increase in tariffs above bound levels. Bound MFN tariffs are the rate against which regional tariff preferences or other import reductions are referenced. Bound rates have typically been the rate used as the basis for tariff reductions in multilateral trade negotiations. The tariff schedules of most WTO members reflect the tariff rates established by the Uruguay Round. Tariff schedules of members who joined the WTO since 1995 were developed through accession negotiations. In general, these bindings reflect the rate effective for 2000 and beyond for developed countries and 2004 and beyond for developing countries, although all ceiling bindings took effect in 1995.

Some tariffs take the form of *tariff-rate quotas (TRQs)*. TRQs specify that a limited quantity of a

good may be imported at a low tariff, the “in-quota” tariff. Once the quota level has been reached, unlimited imports of the same good may be imported at a higher “over-quota” tariff. Prior to the Uruguay Round, many WTO members applied a wide range of nontariff barriers (NTBs) on imports of agricultural products. The Uruguay Round replaced NTBs with tariff-rate quotas; a process also known as tariffication. The tariffication process provided for two types of TRQs: minimum access and current access. The minimum access level is the quantity allowed to be imported at the lower tariff. It was set at 3 percent of consumption in 1986-88 in the base period, to be increased to 5 percent of base consumption by 2000 (2004 for developing countries). Current access was to be provided for products subject to tariffication with imports exceeding 5 percent of domestic consumption in the base period.

Although all WTO members established bound tariffs in the Uruguay Round, the actual *applied tariff* that a country imposes may be lower than the tariff binding. Unlike bound tariffs, applied tariffs may be raised above published levels (up to bound rates) without notice or compensation to affected trade partners. A comprehensive database of applied tariff data across WTO members is not readily available. However, a subset of applied tariff data for several developing countries from the AMAD and UNCTAD TRAINS databases was collected for this report. The data are used to illustrate the differences that may be observed between bound and applied rates in some countries.