

## Appendix 3-1

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It is no easy task to even approximately measure the protective effect of a country's tariff schedule by collapsing it into a single measure such as a mean. Undeterred by this difficulty, economists have devised numerous ways to estimate tariff means. At the same time, most caution against interpreting these measures as an expression of the restrictive effect of duties on trade flows. The most common procedures generally used involve either calculating a simple average of all tariffs or assigning weights to tariffs before averaging.

The main problem with simple averages is that they fail to distinguish between "important" and "unimportant" tariffs, even though the relative importance of individual tariff lines in a country's tariff schedule differs considerably. In the U.S. agricultural tariff schedule, for example, imports in 2001 ranged from a high of \$2.3 billion under the national tariff line for beer from malt to just \$330 under one of the over-quota national tariff lines for long-staple cotton. Across the 1,754 agricultural tariff lines within the U.S. schedule, 238 registered no imports at all in 2001. Many of these items faced tariffs in excess of 100 percent. Despite its limitations, the simple average is often used because it is relatively easy to compute and understand.

The common alternative to a simple average involves assigning weights to each line in an effort to emphasize certain tariffs over others. The most commonly used weighting scheme assigns weights based on the value of a country's imports at each tariff line. This would be equivalent to dividing the value of total imports by the total duty collected, if all imports were assessed the rate in question. This approach has repeatedly been shown to provide biased results, since low tariffs tend to be associated with high imports and thus large weights, while high tariffs tend to restrict or prohibit imports and thus have small or zero weights. In addition, countries often apply different tariffs based on the country of origin due to free trade agreements or the extension of tariff preferences under nonreciprocal programs such as the Generalized System of Preferences (GSP). Thus, the information conveyed by a tariff mean calculated using an importer's MFN rates may have no value to a trading partner that faced preferential rates.

To remedy these deficiencies, Sandrey uses the Relative Tariff Ratio Index (RTR) to measure and compare relative levels of tariff protection between trading partners. The RTR first matches an exporter's trade to an importer's tariffs, using the exporting country's total exports as the weighting scheme. This provides a practical way of distinguishing between "important" and "unimportant" tariffs in the schedules of each of the exporter's trading partners.

In order to calculate an RTR, one would, of course, need comparable data between one partner's exports and the other partner's tariffs. Unfortunately, these data do not necessarily exist at the tariff-line level, when a country has bound its tariff at a level more precise than the HS 6-digit level. Tariff schedules across countries use identical HS nomenclatures for categorizing duties up to the 6-digit level. Beyond the 6-digit level, however, commodity definitions vary from country to country, making specific comparisons across countries impossible. In our calculations, we used trade data for the 3-year period, 1998-2000, from the United Nations Trade Database, a collection of trade statistics reported by member countries to the United Nations. Agricultural trade is aggregated into 682 HS-6 categories. Because the HS-6 categories are less detailed than many country's tariff schedules, it was necessary to first average tariffs to the HS-6 level. This was done via a simple average. We then calculated weights based on the value of each exporting country's total exports at the HS-6 level during the 1998-2000 period.

These weights were then used to calculate a unique average tariff for each set of trading partners. This was done by weighting each of the importing country's average tariffs at the HS-6 level by the proportion of the exporting country's total exports accounted for by products found in that HS-6 category. For example, assume country A's only export was wheat, while country B's only exports were wheat and soybeans, and each accounted for 50 percent of the total export value. If both countries had a tariff of 20 percent on wheat and zero on soybeans, then country A would face an average tariff of 20 percent in country B, while country B would face an average tariff of 10 percent in country A. Even though both countries have over 600 HS 6-digit average tariffs, the only tariffs that factor into the calculation of the importing country's average are those on products the trading partner is exporting.

While we find this method of weighting tariffs appealing because it avoids the problem of restrictive tariffs getting little or no weight, like all methods, it is not without its potential drawbacks. The weighted tariff averages calculated using this methodology are biased in favor of products that the exporting country is actually exporting, rather than those it might potentially export. One may argue, however, that given the mercantilist view that most governments bring to trade negotiations, actual exports tend to be more influential than potential ones when individual tariff barriers are considered. The reality is that actual trade is known beforehand, while potential trade can only be estimated after factoring in changes in tariffs. The measure also does not account for demand differences across individual importers. Products that a country does not export in large amounts, but for which potential import demand in an individual importing country may be relatively large, will receive low weights. One also runs the opposite risk of giving large weight to products that in certain countries may not have any import potential due to a lack of consumer demand for reasons related to individual tastes and preferences, religious restrictions, or public health concerns.

Tariffs used in the calculations included the final bound MFN tariffs scheduled by WTO members and the actual tariffs applied to trade. To the extent possible, all non ad valorem duties have been expressed in ad valorem equivalents, which are needed for the calculations. The final tariff bindings reflect the rate that will be effective after phased implementation of Uruguay Round tariff cuts. As a general rule, developed countries phased in their tariff schedules during the period 1995-2000. Developing countries began phasing in their tariff reductions in 1995 as well, but have until 2004 to complete implementation. In cases where developing countries applied tariffs that were unbound, they had the flexibility to offer ceiling bindings on these products. These ceiling bindings were exempt from the reduction commitments, so the final bound tariff would take effect in 1995.

For the United States, the applied tariffs differ from the MFN bound tariffs depending on whether the country is a NAFTA partner or whether it qualifies for one of several nonreciprocal trade preference programs, such as the GSP, the CBERA, and the ATPA. Likewise, the tariffs the United States faces in other countries can differ from the bound rates if a country applies a lower MFN rate in practice. The only preferential rates the United States faces in the hemisphere in 2001 were those negotiated through NAFTA.