

Calculating ad-valorem equivalents tariffs in MAcMaps: Elements on the new methodology

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Specific Ad-valorem equivalents (AVE)

Experiments on agricultural trade liberalization show that using bilateral unit values (BUV) leads to high variability in AVE values in a given sector. Small flows, in particular, often produce BUV that widely differ from world levels. This lack of robustness is due in many instances to measurement errors, or even reporting errors (errors in the physical units reported, etc.). The filter rule currently used in *MAcMaps* (avoid exceeding a BUV in excess of 5 times the world average) does not eliminate these problems.

Therefore, we have developed a new methodology for handling unit values. The new estimate of the unit value associated with any given bilateral flow will be based on the median unit value of the entire reference group. (We have adopted a new set of reference groups based on a combination of 2001 PPP GDP per capita and trade openness statistics.) This ERGUV (Exporter Reference Group Unit Value) offers two advantages: (i) the endogeneity bias (there is an incentive to alter product quality in response to a specific tariff) is not as strong in the case of ERGUV; (ii) using a median value limits the influence of extreme BUVs; (iii) more importantly, the ERGUV is a more robust to measurement errors on small trade flows (e.g. the impact of tariffs on Arabian thoroughbreds in the overall BUV will be minimized!).

Note that using ERGUV thus assumes that an exporter's structural specialization is identical across all export markets; the UV are no longer market-specific.

Of course, one drawback with the use of ERGUV is that some information is lost relative to differences in product quality at the bilateral level. On the other hand, this quality information is only useful insofar as it is structural in nature, in which case we would expect it to remain relatively constant across reference groups (if not, it is very likely that these differences are endogenous to protection). In particular, if unit values differ because of an exporter's cost-competitiveness, and not because of quality-related factors, then there is no point in computing a different AVE.

In addition, a filter rule is still necessary. One possibility would be to eliminate unit values outside of the range $[1/3 ; 3]$, where this refers to the ratio of the ERGUV to the world unit value. This rule is tighter than before, but it might be useful for the sake of robustness. Any unit value outside of this bracket would be truncated to the top or bottom

¹ These notes are drawn from a memo intended for internal circulation. A detailed description of the methodology is in progress, and should be available by mid- March 2004.

limit. This is different from the previous method of filtering UVs, in which the unit value of the reference group was used instead.

One final step to ensure robustness to annual variability in international trade involves using a three year average (based on the 2000-2002 period) instead of simply using the 2001 estimate.

The Problem of Prohibitive Tariffs

The presence of potentially prohibitive tariffs can be problematic – particularly when combined with trade data from a different source – or when applied to an aggregated product category. (E.g., the case where there are no imports on a line with extremely high rates, but positive imports for other lines less heavily protected) Consider the case where a prohibitive tariff is applied to a small, but non-zero trade flow. This estimated level of imports is used to calibrate import demand. In this case, liberalizing would multiply the initial demand by a large factor (since the drop in tariffs is also very large), which is not what is observed in real life (if positive import values are due to aggregations, a drop in the prohibitive tariff would not impact the neighboring lines).

There is no ideal solution to this problem, especially since it is impossible to calibrate a demand curve when protection rates are prohibitive, or generally speaking when the initial demand level is not representative. Therefore, we take the approach of establishing an upper limit to the EVA in the model starting at the HS6 level. This upper limit will be computed empirically. As an example, one may conceive an indicator such as $I(t) = \{\text{value share of world imports with a tariff rate} > t\} / \{\text{frequency of tariff rates} > t\}$. Such an indicator would decrease with higher t values. By plotting this behavior, one would expect to determine a rate above which all tariffs would be considered prohibitive (for example, a t value above which $I(t)$ is always less than 1/3, or something along those lines).

Tariff Rate Quotas

So far, the formula used in *MAcMaps* (the trade-weighted average of inside and outside rates) has underestimated the level of protection for these commodities, especially when the out-of-quota imports are small, so that the higher outside rate is weighted by a small out-of-quota volume).

For these values to make sense in a CGE model, all 3 dimensions are needed; the quota, the out of quota tariff and the in-quota tariff.

Although this is obviously imperfect, the usual *MAcMaps* aggregation procedure will be applied to IQTRs and OQTRs, and quotas will be simply summed. An average fill rate may then be computed as a quota-weighted average across the lines concerned.