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## TRADE LIBERALIZATION: THE RESULTS FROM WORLD TRADE MODELS

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Most countries intervene in their agricultural sectors in complex ways. Some of the intervention is with border policies such as taxes and tariffs but many countries, especially the developed ones, have a variety of complex "domestic" policies which guide their agricultural sectors and most importantly, have large spillover effects on world markets and world agricultural trade.

Past trade negotiations have largely dealt with trade-distorting measures at the border and the General Agreement on Tariffs and Trade (GATT), which hosts trade negotiations, has historically concentrated on trade-distorting border measures in the negotiating process. However, the upcoming round of trade negotiations is supposed to include agriculture and must of necessity deal with the analysis and negotiation of these complex "domestic" policy measures.

A very significant analytical and political beginning was made on the "agricultural" trade-negotiating problem in the Organization for Economic Cooperation and Development (OECD) in Paris. An analytical methodology was applied which allowed a simple summarization of all policies influencing agricultural supply and demand in terms of "producer" and "consumer" subsidy equivalents. These measures were inserted into a static modeling framework which allowed the calculation of the impacts of changing these policies. Concurrent with the OECD efforts, the World Bank commissioned a study for its 1986 development report which outlined the impact of the removal of agricultural protection on a worldwide basis (4)<sup>2</sup>. This World Bank model was developed by Australian researchers R. Tyers and K. Anderson. The model had less commodity detail than the OECD model but more coverage for developing countries.

These two models and their resulting analysis have provided an early basis for examining the potential impact of the removal of policies that distort world agricultural markets. They have served the same purpose (for agriculture) as earlier world models by Cline at the Brookings Institution, Baldwin at Wisconsin, and Stern at Michigan did prior to the last round of trade negotiations in outlining possible losses and gains from various liberalization scenarios.

At ERS, USDA, we have the responsibility for doing the same kind of model-based analysis to support U.S. participation in the upcoming trade negotiations, which will include agriculture. We have developed a model-building algorithm called SWOPSIM--a Static World Policy Simulation framework (2). The SWOPSIM framework was tested by using OECD and World Bank data and parameters to build our own versions of these models (named appropriately, OECD and BANK) using our SWOPSIM model structure. We then ran OECD and BANK liberalization scenarios and obtained essentially the same results as the OECD and World Bank did with their models. We have gained some experience from our use of our versions of the World Bank and OECD models and are applying it to our model-building efforts.

For example, the results of the OECD model simulations differ from those of the BANK model because of the assumed response for centrally planned countries and developing countries. The OECD model assumes no supply-demand response in the centrally planned countries to world price changes caused by liberalization of agricultural policies. The BANK model has

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<sup>2</sup>Underscored numbers refer to sources listed in the References at the end of this paper.

considerable country detail for developing countries and assumes fairly high long-term supply and demand elasticities for centrally planned and developing countries. As a test of this difference in responsiveness, we shocked the U.S. supply in our versions of the OECD and World Bank models and calculated the implied export demand elasticity for U.S. wheat. Our OECD model gives an implied U.S. wheat export demand elasticity of -2.7 (identical to the one calculated at the OECD with their model), while our version of the World Bank model implies an elasticity of -18. If, in turn, the price responsiveness of our BANK model for the centrally planned countries is turned off during a simulation (we have this capability in SWOPSIM), the implied elasticity for U.S wheat export demand falls to -4.8.

The above exercise of replicating and analyzing the OECD and World Bank models provided us with a validation of our modeling framework and highlighted some key sensitivity issues regarding the responsiveness of the nonliberalizing world to agricultural liberalization. We have now created a fairly large data base with associated protection measures (3). From this base and using the SWOPSIM algorithm, we have created appropriately sized world trade models to analyze trade liberalization issues for the United States. Our main trade liberalization model is called TLIB. (Currently in TLIB we have an implied elasticity of demand for U.S. wheat exports of about -6 without damping the responsiveness of the centrally planned countries.) Our SWOPSIM framework also has allowed us to create a Canada-U.S. free trade area model (CUFTAM), which incorporates an Armington-type demand system to handle the the bilateral trade flow issues that a free trade area analysis requires (1).

In summary, although the analytical problems of dealing with complex agricultural issues in trade negotiations are difficult, analytical methods have been developed and exercised, which allow us to deal with such questions. Our work will build upon the efforts at the OECD and the World Bank. Most importantly, our modeling framework allows extensive sensitivity analysis of agricultural trade liberalization results to parameters that have weak empirical bases.

### References

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