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Agricultural Policy Reform in the WTO:
Challenges for Analysts

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I want to first of all take this opportunity to thank Thomas Hertel and the GTAP staff at Purdue University for giving me the opportunity to talk about the challenges that we had in the first stages of the ERS research program on WTO matters. Tom well knows what many of these challenges were, because he and his staff worked very hard with us to develop a global agricultural policy database that improved our ability to analyze the increasingly complex farm programs that are now under negotiation. These initial efforts have made us more aware of the distance we have yet to cover if we are to credibly analyze farm policies in global CGE modeling frameworks. Today, I want to talk about both our recent accomplishments and some priority areas for future work.

Background

Negotiations on the agriculture sector were initiated in Geneva in March of 2000. They are being conducted as special sessions of the WTO Committee on Agriculture. The new negotiations are expected to address three areas of national agricultural policies, which are sometimes called the three pillars of the Uruguay Round's Agreement on Agriculture (URAA):

- Market access (tariffs, tariff rate quotas and other trade barriers),
- Domestic support, and
- Export subsidies.

Article 20 of the URAA also provided for other topics to be considered in further negotiations. These "built-in" agenda items include discussion of members' experiences with the implementation of the Uruguay Round commitments; the effects of the reduction commitments on world trade in agriculture; non-trade issues such as environmental concerns, rural development and food security; and provisions for special and differential treatment of less developed countries.

Main Findings of the ERS WTO Analysis

The USDA's Economic Research Service analyzed options for further reform of the three pillars of the WTO. This research, published as *Agricultural Policy Reform in the WTO – The Road Ahead*, was intended to provide a broad perspective on the global and strategic issues present at the outset of the negotiations. The two questions addressed by the research program were:

- What are the economic costs associated with WTO members' distorting agricultural policies?
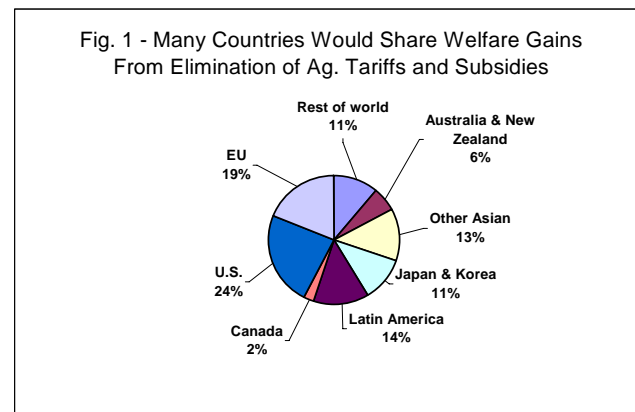
- What are the main options for reforming each pillar of the agreement?

As the negotiations progress, the "big picture" developed in this stage of ERS' WTO research program will be complemented and extended by more detailed scenario analysis to support negotiators' decision-making regarding specific proposals and positions.

The effects of fully eliminating agricultural tariffs and subsidies

A hypothetical scenario in which all agricultural tariffs and subsidies are fully eliminated may not be very realistic, but it can help to define what is at stake in the agricultural negotiations. Global agricultural policy distortions impose substantial costs on the world economy. Over the long term (of about 15 years), their full elimination would lead to an increase in world welfare, or consumer purchasing power, of $56 billion annually, which represents about two-tenths percent of projected global GDP in 15 years. Welfare benefits to the U.S. from the elimination of world agricultural policy distortions would be $13 billion annually (fig. 1).[2] Because U.S. agricultural tariffs and subsidies are relatively low, most of the benefits for the U.S. would come from policy reforms in our trade partners.
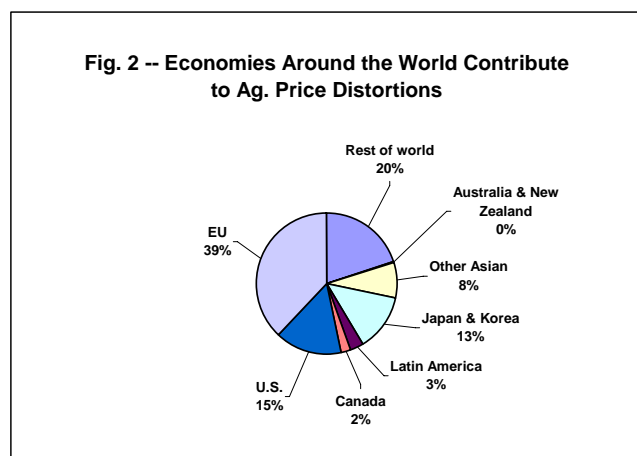

Fig. 1 - Many Countries Would Share Welfare Gains From Elimination of Ag. Tariffs and Subsidies

Rest of world 11%
Australia & New Zealand 6%
EU 19%
Other Asian 13%
U.S. 24%
Japan & Korea 11%
Canada 2%
Latin America 14%

Eliminating agricultural policy distortions would help raise world agricultural prices in several ways. A country's removal of tariffs and other import barriers will lower its production and increase its demand for products from exporting countries, raising world prices. Eliminating domestic support removes the motivation for farmers to over-produce, which depresses the price of subsidized commodities. Eliminating export subsidies prevents the dumping onto world markets of excess supplies, which are often the result of domestic subsidies. In total, eliminating all agricultural policy distortions (tariffs, tariff rate quotas, domestic support and export subsidies) could raise world agricultural prices to about twelve percent higher than they would otherwise be. Elimination of only tariffs and tariff rate quotas (TRQ's) would account for most (52 percent) of the potential price increase. Eliminating only domestic support or only export subsidies would have comparatively smaller roles in the price effect, of 31 percent and 13 percent respectively. (The remaining 4 percent reflect the interactions when removing all policies simultaneously.) Eliminating all of the agricultural policies of the EU alone would account for 39 percent of the potential agricultural price effects of global policy reforms. Japanese and Korean policies combined would account for 13 percent of the global price increase, and U.S. policies would account for about 16 percent (fig. 2).

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[2] Figures 1 and 2 are from Diao, Somwaru and Roe, "A Global Analysis of Agricultural Reform in the WTO Member Countries," in USDA-ERS, *Agricultural Policy Reform in the WTO: The Road Ahead* (2001).

Despite higher world food prices, consumers in most countries would still benefit, because of their removal of tariffs and the over-all economic gains from a more efficient allocation of global agricultural resources.

Options for Reforming Agricultural Policies

Fig. 2 -- Economies Around the World Contribute to Ag. Price Distortions

Rest of world 20%
Australia & New Zealand 0%
EU 39%
Other Asian 8%
Japan & Korea 13%
Latin America 3%
U.S. 15%
Canada 2%

Partial policy reform is a more realistic outcome of the negotiations, but it is more complicated to analyze. Partial reform requires making a choice among targets or strategies -- we analyzed broad, generic options for reform, rather any particular country's proposal. Also, some farm subsidies are operationally linked with trade policies and reforms of one policy can have an impact on the costs and benefits of interrelated policies. When possible, our frameworks took into account the interdependence of some farm policies.

Options for Reducing Tariffs

Despite the progress made in the Uruguay Round, global agricultural tariffs remain high – the average (simple, un-weighted) global agricultural tariff is 62 percent, compared to less than 4 percent for manufactures. The average U.S. agricultural tariff is relatively low (12 percent) compared to the average rates of the EU (21 percent), Canada (24 percent), Japan (33 percent) and Norway (152 percent).

There is also substantial variation, or dispersion, in tariff rates across commodities. Tariff dispersion refers to differences in a country's rates of protection across commodities. Dispersion can increase the distorting effects of tariffs, if higher tariffs tend to be imposed on more price-sensitive commodities. An example of dispersion is the escalation of tariffs with the degree of product processing. Tariff escalation can result in the effective protection exceeding the nominal rate if tariffs are relatively low on imported intermediate inputs. Imposing higher tariffs on processed goods also impedes trade in high value products, the fastest growing segment of world agricultural trade, which tends to be highly sensitive to price. Another issue related to dispersion is the problem of the occasional very high tariffs, or "mega-tariffs" which are sometimes called tariff peaks.

Historically, trade negotiations have taken two broad approaches to tariff reform – formula and request-and-offer. The formula approach defines some general rule that applies to all tariffs; for example "reduce all tariffs by 10 percent." In request-and-offer negotiations, countries draw up lists of the tariffs they want other countries to reduce and the tariffs they are willing to reduce in exchange. Request-and-offer negotiations can be effective in achieving greater market access for specific commodities than might be achieved by formulas. On the other hand, they can leave protection in place for the least competitive industries and they may be unable to achieve deep enough

cuts in the very high tariffs that abound in industrial countries' tariff schedules.

Table 1 – Effects of alternative tariff reduction formulas on average and dispersion of tariffs (percentage rates)

Formula name	Formula	United States		Industrial country total	
		Average	Dispersion	Average	Dispersion
Base	- -	11.9	55	45	130
Linear	50 percent reduction in all tariffs	6.0	27.5	22.5	65
Sliding scale	Eliminate tariffs under 5%, 50% reduction in other tariffs, with a cap of 50%	4.2	8.9	11.3	16.6
Swiss	Progressively larger cuts on high tariffs, with a cap of 45%	5.5	7.4	11.0	12.3

Notes: Dispersion is measured by the standard deviation – the average distance of all tariffs from the mean tariff.

Source: Wainio, et al., ERS-USDA. *Agricultural Policy Reform in the WTO – The Road Ahead.* (2001).

While a formula approach has some distinct advantages, there can be very different outcomes depending on the type that is adopted. There are two generic types of formulas; they target the level and the dispersion of tariffs. A linear reduction formula reduces tariff levels by reducing all tariffs proportionately. As an example, consider the case of a country with a uniform tariff, which means there is no tariff dispersion. A linear reduction of ten percent would reduce the country's average tariff by 10 percent, but would not affect the dispersion, because its tariffs are already uniform. In contrast, harmonization formulas directly target the problem of tariff dispersion. Conceivably, a harmonization formula could require that countries make all of their tariffs a uniform rate. This would leave the average tariff unchanged, but would reduce the dispersion to zero. In practice, many of the tariff reduction formulas proposed in past trade negotiations have included variants that address both tariff levels and tariff dispersion. Many combine some over-all reduction of the average rate with harmonization, based on the progressively larger reduction of higher rates, or at least, a requirement that all tariffs be reduced so that the problem of tariff dispersion is not significantly worsened.

Given the tariff rates that countries currently have in place, what is likely to be the most effective formula in terms of achieving greater market access? From a global perspective, harmonization formulas that target higher tariffs are more likely to be effective than a linear approach in lowering both the average tariff and the dispersion, because of the many very high tariff lines in the current structure of global tariffs (table 1). Harmonization formulas that focus on eliminating low, or "nuisance" tariffs would have a relatively large affect on the average U.S. tariff, because most U.S. tariffs are low. Formulas such as the "Swiss" formula applied to manufactures in the Tokyo round, which mandates proportionately larger cuts in high tariffs, have a relatively greater impact on other industrial countries' tariffs than on the U.S. This is because most other industrial countries have a larger number of higher tariff rates.

Options for Reforming Domestic Support

One of the most important aspects of the URAA was the distinction made between domestic agricultural support that significantly distorts production and trade (amber box subsidies), and those subsidies that

were agreed to have minimal or no distorting impacts (green box subsidies). Only the former was made subject to reduction commitments. (The URAA also exempted blue box policies, which are subsidies offset by supply constraints.) These commitments were implemented by defining an aggregate subsidy measure, the Aggregate Measure of Support (AMS), as a means to quantify and compare countries' over-all annual levels of domestic support that are subject to URAA disciplines. WTO members were required to reduce their amber box domestic support during the implementation period relative to a base level of support in the 1986-88 period.

Table 2 -- Reduction commitments if UR base is lowered an additional 20 percen		
	% of WTO ceiling met in 1998	Required percent cut AMS
Australia	23.4	0.0
Canada	8.6	0.0
EU	74.5	-7.1
Japan	77.2	-10.4
Korea	80.1	-13.5
Mexico	6.6	0.0
Norway	87.8	-21.1
New Zealand	0.0	0.0
Poland	8.3	0.0
Switzerland	71.0	-2.5
United States	44.7	0.0

Source: Young et al, in ERS,-USDA, Agricultural Policy Reform WTO (2001); calculations based on data from OECD and WTO

The URAA left in place an uneven playing field of domestic support across countries and commodities. Countries with relatively high support levels in the base period have AMS limits, or ceilings, that allow continued relatively high support, while countries with no

support in the base period are constrained in their ability to introduce it. In addition to the disparity among countries in their total levels of support, there is dispersion in the level of support provided to individual commodities. Many countries provide most of their commodity-specific AMS support to a small number of commodities, especially rice, sugar and dairy.

As in the case of tariffs, there are two general approaches to domestic policy reform – lower the aggregate levels and lower the dispersion of domestic support. A reduction in countries' over-all levels of domestic support, without affecting the distribution of its support across commodities, could be achieved by extending the URAA commitment for developed countries with a further 20 percent reduction in the AMS ceilings (40 percent below the 1986-88 base AMS). This would impact countries differently because many countries' aggregate domestic support is already below the ceilings they committed to in the URAA, based on 1998 program levels. As an example, an additional 20 percent reduction in the AMS ceilings would leave many countries unaffected, including the U.S., Canada, Mexico, Australia and New Zealand.[3]

An alternative approach to reforming domestic support is to "level the playing field" across countries and commodities. Variation in levels of support can be reduced by setting limits on commodity-specific support, expressed as a percentage of value of production. (Non-commodity specific support is distributed to commodities based on shares in total farm production or historical program benefits.) If

commodity support is leveled across countries and commodities, more countries and a different mix of commodities will be affected by reform. Most countries, including the U.S., would now be required to reduce support for at least one commodity, especially for livestock, dairy, rice, and sugar (table 3).

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[3] Since this research was completed, Japan notified its domestic support expenditures for 1998 to the WTO. Some of its 1998 farm expenditures under its new Basic Law on Food, Agriculture and Rural Areas are included in the blue box, so that Japan's 1998 amber box expenditures are less than 20 percent of its AMS ceiling. Japan would therefore no longer be affected by an additional 20 percent cut in URAA ceilings, and may not face the commodity-specific limits reported in table 3.

Most of the value of domestic farm support is provided through price support programs, and most price support programs are implemented through trade restraints and export subsidies rather than stock holding. The dependence of domestic support on trade policies has led some to argue for a strategic approach to negotiations: focus on reducing tariffs and export subsidies, and let tighter trade policy rules force reforms on domestic farm programs. Assuming that countries respond to constraints on domestic support by dismantling related import barriers and export subsidies, the trade policy component of both the AMS scenarios considered here accounts for 83 percent of their global trade effects. This provides a measure of the dependence of domestic support on trade policies.

Table 3 – Commodity-specific AMS: reduction needed to keep commodity-specific AMS less than 30 percent

	Total	Wheat	Rice	Course	Oilseeds	Sugar	Milk	Beef & Sheep	Other Meat	Wool	Horticulture	Miscellaneous
					Percent Change from base AMS							
Australia	0	0	0	0	0	0	0	0	0	0	0	0
Canada	0	0	0	0	0	0	-48	0	0	0	0	0
EU	0	0	0	0	0	0	-44	-15	0	0	-16	-28
Iceland	-38	0	0	0	0	0	-63	0	-70	0	0	0
Japan	-19	-65	-64	-56	-17	-51	-62	-6	-11	0	0	0
Korea	0	0.00	-57	-57	-61	0	0	-27	0	0	0	0
Mexico	0	0.00	0	0	0	-9	0	0	0	0	0	0
Norway	0	-37	0	-31	0	0	-10	0	-20	0	0	0
New Zealand	0	0	0	0	0	0	0	0	0	0	0	0
Poland	0	0	0	0	0	0	0	0	0	0	0	0
Switzerland	-41	-35	0	-36	-52	-47	-43	-36	-40	0	0	-40
United States	0	0	0	0	0	-19	-49	0	0	0	0	0

Source: Young, et al. in USDA-ERS, *Agricultural Policy Reform: The Road Ahead* (2001). Data are based on WTO notifications, OECD PSE data, and ERS calculations.

Reforming Export Subsidies

Export subsidies are usually used when relatively high domestic support prices create an excess supply, and subsidies are needed to sell export products at lower world prices. The URAA approached the reform of export subsidies by placing restrictions on both the volume and the value of subsidized exports. Targeting both the value and volume creates effective constraints in times of both high and low prices. When world prices are low, the value constraint is more effective, because the subsidy (the wedge between the internal domestic support price and the competitive export price) becomes larger. When world prices are high, the value constraint becomes less binding but the volume constraint can still set some limit on export subsidies. Value limits also help to weaken the link between export subsidies and fixed internal price supports, since constrained export subsidies can now only partially offset the effects of declining world prices.

Options for reforming export subsidies are mainly related to the effects on EU trade policy, since the EU accounts for over 90 percent of global export subsidy expenditures. In 1995-96, when world prices were high, the EU came closer to filling its volume commitments than its value commitments. As world prices fell beginning in 1997, the value of the EU's export subsidies has increased. Through 1998, the volume commitments have still been more binding on EU exports than value commitments, with the exceptions of sugar, processed fruits and vegetables, tobacco and alcohol. Even if it fully eliminates export subsidies, the EU will be able to competitively export grains and oilseeds, and some pork and poultry, but will continue to be uncompetitive in exports of beef.[4]

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[4] See Leetmaa, "Effects of Eliminating EU Export Subsidies," in USDA-ERS (2001).

Challenges for Analysts of the WTO Agriculture Negotiations

In this section, I will discuss the challenges that we faced in the ERS WTO project in modeling agricultural policies – focusing on market access and domestic support issues. I'll talk about what we achieved and identify the work that remains to be done in these areas, and in the area of regional trade agreements.

Market Access: The development of the Agriculture Market Access Database (AMAD) has made global data on the bound and applied agricultural tariffs for many countries much more accessible to analysts. The AMAD data were incorporated into the ERS WTO project database, ensuring a consistency between our analysis and the tariff rates being negotiated at the WTO.

Many of the country proposals at the WTO call for lower and more uniform agricultural tariffs. These proposals are driven by countries' observations, confirmed by the AMAD database work, that agricultural tariffs remain high and that tariff rates vary considerably across countries and commodities. The work at ERS on tariffs applied generic reduction modalities to the tariffs of industrial countries, and then compared descriptive statistics (means and standard deviations of reformed tariff schedules) among countries following each type of tariff reform. The strength of this exercise was its preservation of the level of detail in industrial countries' tariff schedules.

So far, much of the focus in the WTO and in the early analysis of the negotiations has been on the heights and patterns of pre- and post-reform nominal tariffs. There has not as yet been much focus on the *effects* of current tariffs or reform modalities on trade or welfare. In this respect, CGE modelers can add a different and useful perspective to tariff reform analysis. Because the models contain input-output relationships and describe the demand and supply characteristics of

sectors, they can start shifting the focus of the debate toward the trade and welfare outcomes of current and alternative tariffs.

In particular, CGE's can be used to analyze some of the common themes found in many of the WTO proposals. One theme is the quest for more uniform global tariffs, an idea that has a widespread and intuitive appeal. CGE models can be used to test whether making tariffs more uniform will lead to a relatively uniform expansion in market access across countries, using a framework that takes into account countries' underlying supply and demand behavior. Concepts such as the trade restrictiveness index can be computed within CGE models and used to rank the relative trade restrictiveness of tariffs and other policies across countries (Anderson and Neary, 1996). Effective rates of protection – the protection a whole tariff schedule provides to a sector's value added - can be easily computed by CGE models, and extended to include the distorting roles of other farm programs in protecting value added and to allow for endogenous product and factor prices (Neary, 1998).

There is no doubt that negotiations will focus on the reduction of nominal tariffs, while the effects of tariffs on trade behavior should be the focus of analysts. CGE modeling can help to influence negotiations by contributing analysis of the market access effects of what could be complex tariff reduction proposals.

The proposals are likely to be about both the sizes of the tariff cuts and the phase-in periods for the cuts. Most CGE model applications provide counterfactual simulations showing only the long-term adjustments to a policy change. Analysts in this round are likely to be asked to give more careful attention to the transition path to freer trade, not only in market access but also in the other pillars. Some possible issues are: Should different types of countries be allowed special and differential transition paths? What would be the implications of allowing a "roll-over" of reduction commitments, which was allowed for export subsidies in the URAA?

Domestic support With the URAA's categorization of domestic support as green, amber, and blue, domestic subsidies have become more complex than they were at the outset of the Uruguay Round. Countries continue to restructure their domestic farm programs, shifting out of traditional, amber box production subsidies and into less coupled programs that meet the URAA criteria for being minimally trade distorting and therefore exempt from reduction commitments.

Until recently, global agricultural models have generally treated domestic programs as fixed output or input ad valorem wedges. These wedges generally did a good job of capturing the main farm programs in many countries. However, many farm programs now have operational features that are not captured very well by fixed wedges. Direct payments, insurance subsidies, reliable "disaster" payments, and subsidized savings accounts are examples of some recently instituted farm programs. The usefulness of any type of model to the WTO negotiations is going to depend on its ability to reasonably represent the way that such farm programs affect production and trade.

CGE models built with GTAP data will benefit from the agricultural protection database to be provided in the new release based on work at ERS and input from European researchers. This data separates farm subsidy data from the OECD PSE's into four categories:

- Input subsidies linked to a sector's inputs
- Output subsidies linked to a sector's production
- Direct payments that raise farm income but do not influence sectoral production mix, and
- Capital subsidies that reduce the price of farm capital.

This categorization helped to introduce the notion of a "degree of coupling" into ERS work. Input and output subsidies have direct effects on increasing prices and output, while direct payments were assumed to have only indirect effects on output, through the increase in household income and aggregate demand for all items, including food. ERS also described the four policy types as green, blue or amber box. This allowed us to simulate further domestic policy reform in the WTO, by box type.

ERS treatment of farm policies accounted for their price and aggregate income effects, but there are a number of other, non-price channels through which less coupled programs are likely to affect production. These include the effects of higher income and wealth in reducing risk aversion, the effects of some programs in reducing the underlying risk associated with a cropping activity, changes in farm exit, and the relaxation of credit constraints. Work at the USDA is now beginning to focus on how farm programs may affect different farm types differently, depending on farm size or profitability - - which is leading to a "one size doesn't fit all" approach to planning farm programs.

More econometric work needs to be done in this area to quantify and compare the effects of less coupled programs. CGE models cannot get too far ahead of the econometric work in this area, however they can no longer uniformly represent today's diverse farm programs as fixed ad valorem price wedges or they will lose credibility. This is a developing area of policy analysis that CGE modelers will benefit from keeping pace with.

Regionalism

Regional trade pacts have proliferated since the conclusion of the Uruguay Round. CGE models have made major contributions to the analysis of the expected effects of these agreements on global agriculture. In a survey of the CGE literature, Robinson and Thierfelder (1999) found most RTA's to be net trade creating. More recently, gravity models have been used to take a backward look at RTAs' effects on trade. While the evidence on aggregate trade effects is mixed, Zahniser et al.'s (2001) preliminary analysis of regional trade agreements in the Western Hemisphere has found that the pacts have had significant and positive effects on U.S. trade with the rest of the Hemisphere in 58 important agricultural commodities.

For WTO analysis, it will be important that RTA preferences and their effects on global agricultural trade be incorporated into baselines. This is because further multilateral reform will be a second best outcome, imposed on a base that has been distorted by RTA's. For example, CGE modeling of the FTAA and the WTO at ERS, which has taken into account the pre-existing NAFTA agreements, has found that Mexican welfare could decline as a result of expanding freer trade beyond NAFTA. This is partly because of the initial trade diversion, but also because of the heavy dependency of Mexico on the U.S. market. How individual countries will be affected by multilateralism will depend on how they have been affected by existing RTA's. Data on RTA preferences is not readily available but it is an important area for global analysts to develop.

Conclusions

CGE models are likely to play a larger role in the current agricultural negotiations than they did in the Uruguay Round, when multi-country CGE models were not widely available. The experience gained from using CGE models in negotiations such as NAFTA and the FTAA have helped to inform negotiators about the insights that these models can provide and to increase demand for this analysis. Welfare measures, factor price changes, global trade and investment flows, and

second best outcomes such as net trade creation and diversion are examples of the types of variables that can be calculated within the consistent, global CGE framework - - and which are now being demanded by negotiators. While the visibility of CGE-based analysis is like to be greater in current trade negotiations than in the past, so too will be consumers' standards for the reliability of the CGE models' underlying data and their realism in representing policies. Closer collaboration between the database building at GTAP and WTO-related database efforts such as AMAD present an opportunity for GTAP and CGE modeling to strengthen the credibility of their analysis for negotiators.

References

Anderson, James (1998). "Effective Protection Redux," *Journal of International Economics.* Vol., 44(1), pp: 21-44.

Anderson, James and J. Peter Neary (1996). "A New Approach to Evaluating Trade Policy," *Review of Economic Studies.* 63, pp. 107-125.

Economic Research Service, USDA (2001). *Agricultural Policy Reform in the WTO - - The Road Ahead.* AER No. 802. USDA: Washington, DC.

Robinson, Sherman and Karen Thierfelder (1999). "Trade Liberalization and Regional Integration: The Search for Large Numbers." IFPRI, Trade and Macroeconomics Division Discussion Paper No. 34. IFPRI: Washington, DC.

Steven Zahniser, Mary E. Burfisher, Daniel Pick, Greg Pompelli, and Mark Gehlhar (2001). "Regional Trade Agreements and U.S. Agricultural Commodity Trade: A Gravity-Model Analysis." Unpublished USDA manuscript.