INTERNATIONAL TRADE POLICY AND NEGOTIATIONS

Chapter for the

Handbook of Agricultural Economics*

by

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Introduction

This chapter deals with one of the most important and discussed issues that agricultural economists have considered. Trade and trade policy have been important in the world economy, and in the evolution of economics, since before the British Corn Law debates of the first half of the 19th Century. The historical reach of this chapter is not that long, but the substantive importance of the topic has not diminished overtime. Indeed, the agricultural trade policy debate in the last decade has been as vigorous as ever before. .

Because our topic is an economic issue rather than an academic modeling approach or specialty, the literature we consider is somewhat broader than many of the chapters in this volume. We review and evaluate work published in academic journals and books, but we also consider research contributions made in government reports and related documents from international organizations. Our focus is on evaluating contributions to the understanding of agricultural trade policy and trade agreements. To this end we also present some of the necessary factual background about agricultural trade agreements and the policies they have attempted to cover.

Section 1 begins with a review of the role of agriculture in international trade agreements, especially the General Agreement on Tariffs and Trade. The recent Uruguay Round Agreement, and the negotiations that led to it, have a prominent place in the recent literature and are a major part of this first section. After describing the necessary policy background, we turn, in Section 2, to an analysis of each of the major issue areas that are considered in trade policy analysis and in trade agreements. This section considers economic analysis of agricultural import barriers, export subsidies and internal subsidies and how these policies relate to trade negotiations. Section 3 of the chapter reviews the quantitative projections used to evaluate prospective and actual trade agreements. The primary focus is on economic analysis of issues surrounding the Uruguay Round Agreement for agriculture. We consider research conducted in the period prior to an agreement as well as more recent studies that attempt to project the consequences of the actual agreement. We consider projections from a variety of models and approaches. Finally, Section 4 of the report deals with a variety of topics that surround future agricultural trade negotiations.

1 Agriculture in the GATT Negotiations

In agricultural trade, the gap is particularly large between the free trade philosophy of economic textbooks and the reality of pervasive government intervention. Economists have continued to preach the efficiency benefits to be derived from full use of comparative advantage, free consumer choice and uninhibited international trade flows. In agriculture, strongly divergent natural conditions across the globe create ideal conditions for making use of comparative advantage, and differentiated consumer tastes for food call for free access to the wide variability of foods available in different parts of the world. It would therefore seem that free trade should be particularly attractive and relevant in agriculture. However, as in a small number of other sectors (such as textiles), agriculture has traditionally been an area where governments in most parts of the world have been strongly reluctant to open up domestic markets widely to international trade (Johnson, 1991). Indeed, as noted by McCalla (1969), agricultural protectionism has prevailed at least since the fifteenth century. The typical pattern this century is that developing countries tend to keep domestic food prices below prices in international trade, in the interest of food consumers, while industrialized countries tend to maintain high domestic farm prices, in order to protect farmers' incomes (Anderson and Hayami with others, 1986; Honma and Hayami, 1986; Tyers and Anderson, 1992). Moreover, in agriculture and food, the tendency has been strong to insulate domestic markets from the wide price fluctuations in international trade (Tyers and Anderson, 1992). The welfare losses resulting from these trade interventions are large. Some authors have estimated that even the limited liberalization of agricultural trade agreed in the Uruguay Round negotiations will add some 60 billion US $ to world income (see below, section 3.2).

Free international trade may be considered a global public good (Kindleberger, 1986). In the absence of a global government, international agreements between national governments may have to provide this public good. The General Agreement on Tariffs and Trade (GATT) can be seen as an attempt to act in this sense. Indeed, in the framework of the GATT, participating countries have tried to establish the delicate balance between their domestic economic interests and the desire to create the conditions for liberalizing international trade. In agriculture, the attempt to liberalize trade in this institutional framework largely failed for a long time. National interests to control domestic markets have prevailed over attempts to establish international discipline (Section 1.1). It was not until the Uruguay Round of GATT negotiations that more determined progress was made towards integrating agriculture more fully into the liberal international economic order (Section 1.2). The new commitments for agricultural

policies accepted by all participating countries in the Uruguay Round are manifold, and go a significant step beyond the "old" GATT rules for agriculture (Section 1.3). However, the real effects for international agricultural trade will much depend on the practical implementation of these new commitments (Section 1.4).

1.1 The Traditional Treatment of Agriculture in the GATT

In the Western world, in particular in the United States and the United Kingdom, planning for postwar reconstruction and economic cooperation began in the early years of the Second World War. This planning led to the establishment of the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (later the World Bank) in 1944. In the area of international trade, plans were to establish an International Trade Organization (ITO), and in March 1948, at a conference in Havana, Cuba, representatives of 54 nations signed a charter establishing the ITO. The overall charter and the ITO eventually failed to be approved by the U.S. Congress and never became law, but the trade provisions of the Havana Charter and the tariff reductions negotiated in parallel were signed by 23 countries (including the United States). These trade provisions formed the GATT, which became the legal basis for the conduct of trade policies of all countries, which were and later became contracting parties of that agreement.[1] However, it was not until the establishment of the World Trade Organization (WTO), through an agreement signed after the Uruguay Round of GATT negotiations in Marrakesh, Morocco, in April 1994, that an official international organization was added to what before had remained an intergovernmental agreement.

As stated in the preamble to the agreement, the GATT aims at "raising standards of living, ensuring full employment and a large and steadily growing volume of real income and effective demand, developing the full use of the resources of the world and expanding the production and exchange of goods". Its most important principles are (i) most-favored-nation treatment (trade benefits conferred on one country should be extended unconditionally to all other suppliers); (ii) national treatment (imports should be treated no less favorably than domestic products); (iii) elimination of quantitative restrictions on imports and exports; (iv) tariffs, bound in member-country Schedules, as the only means of protection; and (v) reciprocity (negotiations should be conducted on a reciprocal and mutually advantageous basis). These principles take a concrete

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[1] For accounts of the history of the GATT, see the standard texts on the GATT by Curzon (1965), Jackson (1969), Kock (1969), Dam (1970), and Hudec (1975).

form in the detailed provisions and rules contained in the 38 Articles of the GATT.[2] Another important element of the GATT are the country Schedules annexed to the Agreement, which specify the concessions and commitments the individual member countries have made under the GATT. In the periodical rounds of formal multilateral trade negotiations, countries agree on tariff bindings and reductions, other commitments, codes of conduct and rule improvements. The Uruguay Round (1986-94) was the eighth round of such negotiations.

It has often been said that until the early 1990s agriculture was largely outside the GATT.[3] Well to the point as this phrase may be in a more general sense, it is not really appropriate as a technical description of the status agriculture had in the GATT before the Uruguay Round. Agriculture has always been fully in the GATT, in the sense that all the provisions of the General Agreement have applied to agricultural products. Indeed, contrary to trade in textiles and clothing, which was effectively taken out of the GATT through the Multi-Fiber Arrangement and its rather specific provisions, there had never been a separate GATT agreement on agriculture which exempted agricultural trade from any rules of the General Agreement. Hence, agriculture has always been in the GATT in that formal sense and it played a prominent role in the various rounds of GATT negotiations as well as in the day-to-day business of the GATT.

On the other hand, it is true that the actual conduct of policies in agriculture was significantly less disciplined by the GATT than was the case in the sector of manufactures. Non-tariff barriers to imports played a large role in agriculture, as many countries used quantitative restrictions, restrictive state trading, variable levies, minimum import prices and similar measures to provide protection to their farmers. In many industrialized countries these import barriers were complements to administered domestic support prices which had been established in order to keep domestic market prices insulated from and generally above international prices. As a consequence of this domestic price support, or other programs many countries began to have, or continued to produce, commodity supplies that could not be sold on world markets without the help of export subsidies. Many of these policies were not in conformity with the fundamental spirit of the GATT, but in most cases the letter of the General Agreement did not

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[2] In legal terms, after the Uruguay Round one has to distinguish between the "old" text of the General Agreement, now called GATT 1947, and the "new" GATT 1994 agreed at Marrakesh. GATT 1994 consists of the (unchanged Articles of) GATT 1947, a number of protocols and decisions agreed before 1994, and a number of understandings on the interpretation of GATT Articles agreed at Marrakesh.

[3] For early analyses of the treatment of agriculture in the GATT, see Curzon (1965, chapter VII) and Dam (1970, chapter 15). The situation at the eve of the Uruguay Round is discussed in Hathaway (1987). A complete history and analysis of the role of agriculture in the GATT, from the beginning to the Uruguay Round, is provided in Josling, Tangermann and Warley (1996).

provide the means which would have allowed the GATT to discipline them. This was only partly due to the fact that the text of the GATT contained some special provisions for agriculture. As a matter of fact, there are only very few places in the text of the General Agreement where agricultural products (or rather primary products) are specifically mentioned.[4] The single most important of these special provisions, as far as the actual conduct of trade policies is concerned, was the exemption of agriculture from the general prohibition of export subsidies in Article XVI:3.[5] This exemption was not unconditional, but required countries to respect their "equitable share of world trade" in the product concerned. Naturally, what exactly these equitable shares were proved very difficult to define in practice. Hence, there were nearly no cases in which countries were found to be in violation of their GATT obligations regarding agricultural export subsidies, in spite of a considerable number of disputes brought before the GATT. As a consequence, before the Uruguay Round countries could feel largely free to subsidize their agricultural exports as appeared necessary from the point of view of managing domestic markets. The result was a situation in which large shares of world exports of agricultural products were sold with the help of export subsidies. For example, in 1992-3, the subsidized share of world exports was 60 per cent in the case of wheat and 64 per cent in the case of cheese (see below, Table 1.3.3, where some other products are also listed).

There was also a special exemption for agricultural market access in the General Agreement. This was the much-debated Article XI:2(c) which allowed quantitative restrictions on agricultural imports. Again, this exemption was not unconditional. In particular, countries that wanted to invoke it had to impose effective constraints on the domestic volume of production. However, contrary to the case of export subsidies, this agricultural GATT exemption on the import side did not have a major impact in practice, essentially because the conditions to be fulfilled were so demanding that they were met in rather few cases. Indeed, in the many GATT disputes brought to bear on this agricultural exception, not one single case was found where a quantitative import restriction was justified by this agricultural exception. Nonetheless, many governments found other loopholes that allowed them to impose non-tariff barriers on agricultural imports, and as a consequence they did not feel much of a need to invoke

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[4] For an excellent legal analysis of the GATT rules for agriculture before the Uruguay Round Agreement, see Davey (1993). Shorter treatments are found in Hathaway (1987, chapter 5) and Josling, Tangermann and Warley (1996, chapter 6). Hudec (1997) provides an excellent comparison of the legal treatment of agriculture under the "old" GATT with the new conditions created in the Uruguay Round.

[5] The GATT rules described in the rest of this section were those relevant before the close of the Uruguay Round. In purely formal terms they still exist as the Uruguay Round has left the text of the GATT 1947 intact. However, both agricultural exceptions discussed in this section have effectively been superseded by the new rules and commitments agreed under the Agreement on Agriculture concluded in the Uruguay Round.

Article XI:2(c). Many different justifications were used to impose non-tariff measures. In some cases, “grandfather” clauses and protocols of accession allowed the continued use of non-tariff barriers. Other countries had refused to bind tariffs on many agricultural items, and under this legal cover they applied gray area measures such as variable levies and minimum import prices. When none of these options appeared sufficiently convenient, waivers were sought and obtained which allowed the implementation of non-tariff measures. The result was that the ‘tariffs only’ principle of the GATT was not adhered to in agriculture. Before the Uruguay Round, developed countries had refused to bind tariffs on 42 per cent of all tariff lines in agriculture, while only 22 per cent of all tariff lines remained unbound in industry (GATT Secretariat, 1993, pp. 22, 34). In the mid-1980s, 30 per cent of all tariff lines for agricultural products in major developed countries were covered by such barriers as tariff quotas, seasonal tariffs, quantitative restrictions and minimum price policies such as variable levies, while the equivalent ratio for manufactures was only 9 per cent (World Bank, 1986, p. 117).

Not only did many border policies in agriculture escape effective GATT disciplines in these various ways, but there was also little restraint in the provision of domestic subsidies. This situation was not due to any specific weakness of the GATT rules for agriculture. Indeed, in a number of cases countervailing duties were brought to bear on other countries' domestic subsidies in agriculture, and there were also notable cases in which GATT panels found that domestic subsidies had impaired earlier tariff concessions for agricultural products. However, there was no direct constraint on the extent to which governments could grant domestic subsidies to their farmers.

Another area where agriculture was treated specifically was the establishment of regional trading arrangements. Under general GATT rules, customs unions and free trade areas were, among others, required not to erect higher protection against third countries, and to eliminate all trade barriers on "substantially all the trade" on intra-regional trade (GATT Article XXIV). In agriculture, the latter requirement regularly created difficulties because agricultural policies, and in particular levels of protection, often differed significantly among the founding member countries of regional trading arrangements. In customs unions, the decision on the common level of external protection was therefore politically difficult, as evidenced by the heated debate about the appropriate level of common agricultural prices in the emerging European Economic Community in the early 1960s (Tracy, 1982). However, once the common level of protection had been decided, elimination of trade barriers among the members of a customs union was not a major issue. Yet, in the more frequent cases of free trade areas, elimination of trade barriers in agriculture among the member countries has been a significant problem.

In principle, rules of origin can prevent arbitrage trade between member countries with significantly different levels of external tariffs, and this device was successfully (though at high administrative expense) used for industrial products. In agriculture, though, where many products are relatively homogeneous, domestic produce can easily substitute for imported goods, thereby effectively undermining the functioning of rules of origin (Josling, 1993). Hence, elimination of all agricultural trade barriers within a free trade area would tend to reduce the level of protection in all member countries to the lowest common denominator, and would constrain the ability of member country governments to pursue their national agricultural policies (Josling, 1993). Member countries of free trade areas have been, therefore, typically reluctant to include agriculture in the free trade arrangement. It was for this reason that exclusion of agriculture from free trade within the regional arrangement became a customary practice for a long time. The European Free Trade Association (EFTA), and its later free trade arrangement with the European Economic Community under the auspices of the European Economic Area (EEA), are prominent cases in point. The practice of excluding agriculture completely from free trade areas was definitely not in line with the letter of the GATT, but it was tacitly accepted for a long time.

In summary, though agriculture was always fully in the GATT in a formal sense, agricultural policies were, in practice, not very much constrained by GATT disciplines before the Uruguay Round. The damage resulting from this situation, both in agricultural trade and for the functioning of the world trade order, was always very much felt. In all previous GATT rounds, determined attempts were made at rectifying the state of affairs in agriculture, largely without success. In addition, the GATT dispute settlement machinery was kept busy with a far larger than proportional number of agricultural cases.[6] However, little progress was made, and on the eve of the Uruguay Round the discipline in agricultural trade had not improved, and probably was worse than at the time the GATT was established.

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[6] According to a count by Hudec (1993, p. 327), 43 per cent of all complaints brought before the GATT between 1948 and 1989 dealt with agricultural issues. This percentage contrasts rather unfavourably with the much smaller share of agricultural products in total world trade. Hudec also provides a interesting analysis of the outcome of GATT disputes, including those on agriculture.

1.2 The Uruguay Round Negotiations on Agriculture

The seven GATT rounds that had been conducted by the end of the 1970s did not achieve much improvement in agricultural trade (see Josling, Tangermann and Warley (1996) and the literature cited there). How much change was needed became particularly obvious in the 1980s when international market conditions again deteriorated notably and agricultural commodity prices collapsed. In this environment, financial and economic costs of agricultural policies rose sharply in many industrialized countries and triggered an agricultural policy crisis. At the international level, one of the responses was agreement in the Organization for Economic Cooperation and Development (OECD) to embark, in 1982, on a study of agricultural trade issues, under what became known as the Ministerial Trade Mandate (MTM). The analytical methodology of the MTM was based on two approaches. The extent of support provided to agriculture in individual countries was measured by the Producer Subsidy Equivalent (PSE) and the Consumer Subsidy Equivalent (CSE). The quantitative impact of policies on trade was estimated in a multi-commodity trade model that was used to analyze the effects of reducing support in all countries for all agricultural products by 10 per cent. Results were published by OECD, 1987. After that original publication, OECD continued to publish PSE/CSE estimates on an annual basis, in the series whose title now is "Agricultural Policies in OECD Countries". The study created a new dimension of transparency in agricultural policies at the international level, and served to demonstrate that a gradual and balanced reduction in support across all countries would have less dramatic consequences for domestic markets and prices than sometime feared and always asserted by domestic farm lobbies. This work was an important intellectual preparation for the agricultural negotiations of the Uruguay Round.

In the GATT, the 1982 Ministerial Session established a new body, the Committee on Trade in Agriculture (CTA), which effectively (though not formally) prepared the ground for the Uruguay Round negotiations on agriculture.[7] The mandate of the CTA was to examine all policies affecting agricultural trade and to make recommendations for improvements of GATT provisions for agriculture. All participating countries were requested to notify all measures affecting agricultural exports and imports. The result of these notifications, however, remained largely inconsequential. The CTA also discussed how the GATT should deal with agricultural policies in the future, and considered alternative approaches to bringing policies under more

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[7] The Chairman of the CTA, Aart de Zeeuw from the Netherlands, later was to become the Chairman of the Uruguay Round Negotiating Group on Agriculture.

operationally effective GATT rules and disciplines. Though no consensus was reached in the CTA, the approaches considered included some of those later adopted in the Uruguay Round, for example a gradual reduction of export subsidies, a conversion of all non-tariff measures into tariffs, and minimum access commitments.

The eighth round of GATT negotiations, launched in Punta del Este, Uruguay, in September 1986, had a broader agenda than any preceding GATT round, including in particular also services, a sector that had previously not been covered by the GATT. An overall assessment of the Uruguay Round is provided by Schott (1994), OECD (1994b), Senti (1994), Croome (1995), Hauser and Schanz (1995). Agriculture to a large extent determined the pace and progress of the negotiations. Ingersent, Rayner and Hine (1994), Josling, Tangermann and Warley (1996, chapter 7), and Swinbank and Tanner (1997) have described the agricultural negotiations of the Uruguay Round in detail.

In the first phase of the agricultural talks, the initial proposals tabled by major countries in 1987 indicated how far their positions were apart. The United States suggested a complete phase-out over 10 years of all agricultural subsidies and import barriers. The Cairns Group of 14 'non-subsidizing' countries, which played an important role in the negotiations, proposed an approach, which would have come close to that of the United States. The EU, on the other hand, preferred to deal with short-term issues through more traditional measures of market management, before embarking, at a later stage, on support reductions. Japan could not see a point in reducing internal support, but argued for a prohibition of export subsidies. No significant progress was made before the mid-term ministerial meeting at Montreal in December 1988, and during the meeting the gap between U.S. insistence on 'elimination' and EU unwillingness to go beyond 'reduction' of support could not be bridged. However, in April 1989 the deadlock was resolved by an agreement to engage in 'substantial progressive reductions in agricultural support and protection sustained over an agreed period of time', and to freeze support levels for the remainder of the negotiations.

In the second phase of negotiations, countries were requested to table comprehensive proposals by the end of 1989. The U.S. proposal still envisaged an eventual elimination of export subsidies and trade distorting domestic subsidies. On market access, though, the U.S. introduced the concept of 'tariffication', i.e. conversion of all non-tariff barriers to trade into bound tariffs, which would then be reduced, though not necessarily completely eliminated. The EU reluctantly said it was prepared to consider tariffication, provided it was allowed to engage in 'rebalancing' the commodity structure of protection, i.e. raising protection for oilseeds and non-grain feeds so as to make it similar to that for cereals. The EU stated a preference for reducing

support and protection in terms of an aggregate measure of support (AMS), an indicator closely related to the PSE, though based on fixed external reference prices. In an attempt to close the still rather wide gap between the negotiating parties, the Chairman of the Negotiating Group for Agriculture tabled a draft agreement in July 1990, and called for final quantified offers by October 1990. The offers submitted by the major countries turned out to be much closer to one another than were their starting positions. The U.S. suggested a 75 per cent cut in domestic support and tariffs and a 90 per cent cut in export subsidies, over ten years, while the EU offered a 30 per cent AMS reduction and a parallel reduction of tariffs, accepting the principle of tariffication, though conditional on rebalancing. However, the gaps between these offers were still too wide, and in particular the EU was not prepared to accept significant reduction commitments on export subsidies. The ministerial meeting at Brussels in December 1990, which was supposed to close the Uruguay Round, therefore ended in stalemate.

The third and final phase of the negotiations took another three years. It started in 1991 with proposals for a fundamental CAP reform by the EU Commission, which allowed the EU to accept reduction commitments on export subsidies. Based on essential agreement between the United States, the EU and other major players on all the key elements, in December 1991, GATT Director General Arthur Dunkel submitted a Draft Final Act, covering all areas of the Uruguay Round negotiations. The Dunkel Draft already came close to the final agreement, but what was still needed was submission and verification of draft Schedules with all detailed quantified commitments, product by product, by all participating countries. Also, disagreement over a number of details between the U.S. and the EU still needed to be settled, and this was eventually achieved in two sets of bilateral negotiations, in November 1992 (at Blair House, Washington) and, shortly before the final deadline, in December 1993 (sometimes called Blair House II). The agreement on agriculture then freed the way to the overall conclusion of the negotiations, and the Final Act of the Uruguay Round, as well as the Agreement Establishing the World Trade Organization, incorporating all detailed results of the negotiations, was signed at Marrakesh, Morocco, in April 1994.

The Uruguay Round Agreement on Agriculture (the Agreement) establishes new rules for domestic and trade policies, which effectively overwrite the respective provisions of the "old" GATT. The Agreement can only be briefly summarized here. For more detail, see Josling, Tangermann and Warley (1996, chapter 8). Contrary to the situation under the "old" GATT, the definition of what countries are expected to do was not simply left to general rules, but determined in country Schedules of legally binding commitments. These quantitative commitments were derived from policies that existed in a historic base period and from agreed

rates of reduction, to be implemented in the period 1995 to 2000.[8] The Agreement and the country Schedules cover the three areas of market access, export competition, and domestic support, as summarized in Table 1.2.1.

Table 1.2.1: Structure of the Agreement on Agriculture and the Country Commitments a)

Type of Rule	**Market Access** Base: 1986 - 1988	**Export Competition** Base: 1986 – 1990	**Domestic Support** Base: 1986 - 1988
Price	Tariffication of non-tariff measures Reduction of all bound tariffs by 36% on average (minimum of 15%)	Reduction of outlays on export subsidies by 36% (product specific)	Reduction of Total AMS by 20%, except for "green box" measures
Quantity	Minimum access commitments: 3% of domestic consumption, growing to 5% Current access maintained	Reduction of subsidized exports by 21 % (product specific)	
Other	Safeguard provision	Peace Clause	

a) Reduction rates in this table are those for industrialized countries. Reduction rates for developing countries are two thirds of these rates. Least developed countries are exempt from reduction commitments.

Regarding market access, all WTO Members agreed to bind all tariffs in agriculture, to convert all existing non-tariff barriers (with very few exceptions) into bound duties, and not to introduce new non-tariff measures. During the implementation period, tariffs have to be reduced

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8 The methods according to which countries were expected to derive their quantitative commitments from past policies and agreed rates of reduction had earlier been specified in a document entitled "Modalities for the Establishment of Specific Binding Commitments under the Reform Programme". After the Marrakesh meeting, this document no longer had legal power, and whatever had been put into the Schedules became legally binding. - For developing countries, the implementation period for reductions is 1995 to 2003.

by 36 per cent, on a simple (unweighted) average basis, with a minimum rate of reduction of 15 per cent for each tariff line. The tariffs and reduction rates are specified in the country Schedules. Because of the political difficulties Japan and Korea had with the notion of opening up their rice markets, a Special Treatment clause was included in the Agreement which, under rather specific conditions, allowed to delay tariffication.[9] Moreover, Safeguard Provisions were introduced for products that have undergone tariffication, which allow importers to guard against import surges and low world prices.

Where past imports were small or nil, importers had to establish "minimum access" opportunities, rising from 3 per cent to 5 per cent of base period domestic consumption. Moreover, access opportunities existing in the past ("current access") had to be maintained. Both minimum and current access commitments have largely been implemented through tariff rate quotas with tariffs below "ordinary" tariffs, but do not require countries to import the quantities concerned.

Based on past levels of export subsidization for individual product groups, countries have accepted legally binding commitments leading to a reduction in expenditure on export subsidies by 36 per cent, as well as a reduction in the quantity of subsidized exports by 21 per cent during the implementation period. In addition, export subsidies can not be extended to commodities that were not subsidized in the base period. The Agreement contains a list of export subsidies falling under Schedule commitments, and provisions against circumvention of commitments, including rules on food aid. Developed countries, and net-food exporting developing countries, now have to observe somewhat more restrictive rules regarding export restrictions and prohibitions in cases of critical shortages. However, export taxes are not banned by the Agreement.

In the area of domestic support, the variable constrained is not expenditure on domestic subsidies, but the level of sector-wide (rather than product-specific) total support provided by policies covered under the Agreement (the Aggregate Measurement of Support, or AMS). The AMS includes support provided through administered prices, measured against fixed external reference prices, in domestic currency, of the base period. The AMS has to be reduced by 20 per cent during the implementation period. However, measures with no, or at most minimal, trade distortion effects or effects on production are exempted from reduction commitments. This

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[9] In addition to Japan and Korea for rice, the Special Treatment clause has also been invoked by the Philippines for rice, and by Israel for pigmeat, cheese and milk powder.

"green box" of exempt policies is defined in both general form and in terms of an illustrative list of eligible policies.

As a result of the Blair House accord between the United States and the EU, another exemption (called the "blue box") was agreed for certain "direct payments under production-limiting programs". The result is that both U.S. deficiency payments and compensation payments under the reformed CAP of the EU need not be included in the AMS calculation and the reduction commitment. Though this provision targeted the two country-specific cases mentioned, it is general and can therefore be invoked by any country for any policy meeting the criteria specified.

As an incentive for countries to accept the new disciplines and commitments on domestic support and export subsidies, it was agreed that policies that conform to the new rules are sheltered from international challenge under the GATT. This "peace clause" remains in force three years beyond the implementation period of the Agreement, i.e. until the year 2003.

Implementation of the Agreement is monitored by a newly established Committee on Agriculture that, among others, receives and discusses notifications which countries are required to submit regularly In these notifications, countries have to report how they implement their commitments. In the Agreement, countries also committed themselves to another round of negotiations on the continuation of the reform process in agriculture, to be initiated in 1999.

Along with the provisions on domestic and trade policies in the Agreement, the Uruguay Round also resulted in an Agreement on Sanitary and Phytosanitary Measures. The objective was to improve on the rules for technical trade barriers under the "old" GATT by making it easier to distinguish between genuine health and safety issues and disguised protection. The right of countries to set their own safety and health standards was reaffirmed, but with the proviso that such standards should be based on scientific evidence and an appropriate risk assessment.

Another area where some progress was made in the Uruguay Round was the treatment of regional trading arrangements. One of the many arrangements agreed at Marrakesh was the Understanding on the Interpretation of Article XXIV of the GATT, dealing with customs unions and free trade areas. This Understanding does not fundamentally alter the old GATT rules in this area, but largely confirms them and adds a few procedural requirements hoped to result in more stringent application of the rules. In particular, the Understanding does not drop the requirement that "substantially all the trade" between the member countries of a regional trade

arrangement should be included in intra-regional trade liberalization. It appears that this requirement is now taken more seriously by the countries forming, or extending, the rapidly growing number of regional trading arrangements around the world. In particular, the traditional tendency to exclude most of agriculture from regional trade liberalization appears to have faded. Prominent early examples of regional arrangements including agriculture, though not fully, were the Canada-US Free Trade Agreement (CUSTA) and the subsequent North American Free Trade Agreement (NAFTA), including Mexico. Both agreements were concluded while the Uruguay Round negotiations were underway. Under the complex trilateral arrangements of NAFTA (plus the remaining parts of CUSTA), most agricultural tariffs will eventually be eliminated in trade among the three countries, but some non-tariff barriers remain in place, in particular between Canada and the other parties(USDA/ERS,1993). Another example of a regional trade arrangement including agriculture fully is MERCOSUR, the common market among Argentina, Brazil, Paraguay and Uruguay, also concluded while the Uruguay Round was going on.

The rapid spread of regional trade arrangements in recent times raises a number of important questions. In particular, are regional trade pacts a threat to the process of multilateral trade liberalization? Or are they, to the contrary, a useful step in the direction of more liberal global trade? Is there a chance that regional trade liberalization is achieved simultaneously with a reduction of trade barriers in external trade of the regional associates, in what could be called "open regionalism" (Bergsten, 1997)? In agriculture, will growing liberalization of regional trade impose constraints on protectionist agricultural policies of the constituent countries, and thereby trigger agricultural policy reforms, as argued by Josling (1993, 1997)? Is the GATT requirement to include agriculture fully in regional trading arrangements, coupled with the political desire to strengthen international cooperation through more liberal trade in regional groupings, bound to undermine inward looking forces in agriculture? Or is liberalization of intra-regional trade more likely to consume all political capital which governments need in their dealings with domestic farmers, thereby blocking progress towards further multilateral agricultural trade liberalization under the auspices of the WTO? The Uruguay Round negotiations have not provided immediate answers to such questions, but have at least made sure that the spread of regional trading arrangements cannot result in higher protection for agriculture.

In summary, the Uruguay Round Agreement on Agriculture has fundamentally changed the nature of GATT provisions for agriculture. In particular, reasonably well-defined quantitative commitments have replaced qualitative rules. Under the "old" GATT, the widespread lack of tariff bindings and the existence of a large "gray area" allowed many

countries to maintain non-tariff barriers for their agricultural imports. After the Uruguay Round, nearly all agricultural imports are covered by tariff bindings. In the past, the "equitable share" rule was too vague to define quantifiable constraints on export subsidies, while after the Uruguay Round there are numerically specified limits to the extent each country can subsidize agricultural exports. In the area of domestic support, quantitative commitments now define the scope for policies that earlier were only vaguely circumscribed by the general GATT rules on domestic subsidies. The actual practice of trade policies for agriculture in the period immediately following the Uruguay Round has not yet changed noticeably in many countries. However, the new legal framework created in the Uruguay Round will make it easier in future to negotiate further reductions, and as commitments become tighter in quantitative terms, policies are likely to be increasingly constrained. To the extent that this materializes, the Uruguay Round has finally created the basis for liberalizing worldwide agricultural trade.

1.3 Commitments Accepted in the Uruguay Round

Among the specific quantitative commitments participating countries accepted in the Uruguay Round, some directly bind policies (i.e. tariffs), while others bind the effects of policies (i.e. quantities of subsidized exports, expenditure on export subsidies, and levels of domestic support). The practical outcome of the Uruguay Round negotiations for international agricultural trade in the second half of the 1990s was bound to depend on the extent to which these commitments turned out to constrain policies. Largely qualitative analyses of the commitments accepted in the Uruguay Round have been provided by Josling et al. (1994), Hathaway and Ingco (1995), OECD (1995), Tangermann (1996) and Josling, Tangermann and Warley (1996). More quantitative assessments are reviewed below in Section 3.

Because country-specific quantitative commitments did not exist before (under the "old" GATT), a starting point had to be agreed in the negotiations. In general, actual policies pursued in the past served as that starting point, and the base period chosen was the beginning of the Uruguay Round negotiations, i.e. the years 1986-88 for market access and domestic support, and 1986-90 for export subsidies. Since both market conditions and policies keep changing over time, this choice may have been either more or less "generous", in the sense of allowing countries wide or little scope for future policies, depending on the specific conditions prevailing in the base period.

Many countries in various parts of the world have engaged in agricultural policy reforms after the mid-1980s, resulting in declining levels of price support and protection (Josling, 1997). Hence, in many cases the levels of protection and support prevailing in the base period, and therefore the starting levels for reduction commitments, were higher than the levels actually prevailing in 1995 when implementation of the Uruguay Round agreements began. Wherever that was the case, the outcome of the Uruguay Round could not be expected to result in immediate policy adjustments and the corresponding improvements in agricultural trade. It also is true that the commitments differ in their direct trade implications.

After the base period many OECD countries had significantly reduced their levels of domestic support, and it was estimated that already before the implementation period began several of them had reached AMS levels below their commitments for 2000 (OECD, 1995, p. 39 ff; similar estimates are provided by Tangermann, 1996). This was confirmed when countries officially began to notify their 1995 domestic support levels to the WTO Committee on Agriculture and it turned out that in many cases they were already lower than required at the end of the implementation period. In such cases, policy adjustments as required by the reduction commitments had already been made before the implementation period, and the new domestic support commitments, which do not require further policy changes, can be said to contain "policy water" (Tangermann, 1996). A similar example is the element of "policy water" in EU tariffs for cereals and cereal based livestock which resulted from the large reductions of support prices the EU made after 1992, such that the tariff bindings derived from the domestic-external price gap prevailing in the base period are no longer necessary to defend the new much lower EU prices. However, that "policy water" was largely taken out of EU cereal tariffs as the EU agreed, in the Blair House II negotiations, not to charge tariffs higher than necessary to defend its new lower support price.

The base period chosen also was relatively "generous" for tariffication because of the pattern of prevailing world prices for major commodities. World market prices were depressed in the mid-1980s, and rose only slightly until 1988. Hence the gap between domestic prices and international prices, which determined the tariffs to be bound under the tariffication process, was relatively large in that base period compared to the gap that prevailed in the mid 1990s in many cases (Tangermann, 1996). For the same reason, that base period also was "generous" for the market support element of the AMS commitments.

For export subsidies, the base period chosen was more neutral, as the quantities exported with subsidies kept growing during the 1980s and the early 1990s (Tangermann, 1996). This was a key feature of the Uruguay Round negotiations because most observers agreed that

whereas the other elements were important in principle and for the long term, immediate gains in farm trade benefits were most likely in the context of the quantity commitments for subsidized exports. This was the view in the United States as early as the end of 1990 (Sumner, 1992).

Another important factor in implementation was the way in which data were collected and processed for establishing the base period policy situation from which the starting levels for reduction commitments were derived. Rather than appointing some independent body for this purpose (which probably would have been very difficult), each country provided the analysis for its own policies. The results then had to be presented to all participants in the negotiations, in the form of draft Schedules (and supporting tables), so that other countries could check them during the "verification" process in the last months before the Marrakesh meeting. For example, for tariffication it was agreed to start from the tariff equivalents of the non-tariff measures existing in the past, measured as the gap between domestic prices and international prices during the base period.[10] Countries were expected to collect their own data on their relevant domestic and external prices, and to calculate tariff equivalents on that basis. Naturally, in this process countries, who typically resisted reductions in their own protectionist policies, had a tendency to use "favorable" data showing that their levels of protection and support during the base period was high. This meant that their bindings and reduction commitments started at a high level and left as much scope as possible for future policies or negotiations. Though other countries could and did spot such cases during the process of verification, it appears that the base period data presented have rarely been challenged officially. In this context it is important to remember that whatever was in the Schedules at Marrakesh, whether justified or not, became legally binding, and cannot later be legally disputed.

Use of "favorable" data, was prominent in the establishment of tariff equivalents, and the term "dirty" tariffication is often used in this context. For example, Hathaway and Ingco (1995, p. 36) have estimated that the "true" tariff equivalent for sugar in the EU during the base period 1986-88 would have been 234 per cent, while the tariff actually bound by the EU was equivalent to 297 per cent. Similarly, the OECD (1995, p. 27) has estimated that the *ad valorem* equivalent of the domestic-external price gap (the market price support element in OECD terms) of the EU for white sugar in 1986-88 was 235 per cent, while the EU base tariff on white sugar was equivalent to 274 per cent. It is difficult to produce accurate independent estimates of the amount of "dirt" in the newly bound tariffs, but there is little doubt that some tariff bindings which have resulted from the Uruguay Round are higher than a reasonable equivalent of the non-

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[10] Developing countries were allowed to offer "ceiling bindings", not resulting from such calculations.

tariff measures existing in the base period. On the other hand, cases have also been reported (for example by Hathaway and Ingco, 1995) where tariffs bound appear to be lower than the estimated tariff equivalents would have suggested.

Probably more important, though, is the fact that many of the newly bound tariffs are extremely high and, as would be expected if they are designed to be “equivalent” to a prohibitive quota, for all practical purposes, prohibitive. Table 1.3.1 shows initial tariff rates (i.e. tariff commitments for 1995) for examples of selected products and countries, expressed as ad valorem percentages, along with reduction commitments for the Uruguay Round implementation period. Some of these (such as common wheat in the United States) do not relate to new tariffs, but to long established tariffs that are scheduled to decline during the Uruguay Round implementation period. The tariffs shown are the “normal” duties for imports beyond any reduced-tariff quotas that may exist (as a result of minimum access or current access commitments). They may, therefore, not always represent tariffs charged on actual trade flows (which may not exceed the tariff quota volumes), but they are indicative of the levels of protection aimed at by policy makers. Tariff rates of several hundred per cent are not uncommon. In some cases, such as Japan and South Korea for wheat, the within-quota tariff is zero or low and the quantity allowed for import is large. In these cases the protection afforded by the tariff rate on the over-quota quantity is not particularly relevant to the trade. Even when a large quantity of imports are allowed, these cases do allow national governments a degree of managed trade that is used to direct the markets. In general, however, rather than being new trade barriers resulting from the Uruguay Round, these high tariffs (except for the possible amount of "dirt" in them) must be interpreted as reflecting the high levels of protection which non-tariff measures used to provide before the Uruguay Round.

Table 1.3.1: Tariffs Resulting from the UR Agreement on Agriculture, *Ad Valorem* Equivalents, Selected Countries and Products

	Common Wheat		White Sugar		Beef Carcasses, Fresh or Chilled		Butter	
	Initial Tariff %	Reduc-tion %	Initial Tariff %	Reduc-tion %	Initial Tariff %	Reduc-tion %	Initial Tariff %	Reduc-tion %
Australia	0.0	-	31.7	50	0.0	-	4.6	78
Canada	90.0	15	10.7	15	37.9	30	351.4	15
EC	142.3	36	207.1	20	96.9	36	235.3	36
Hungary	50.0	36	80.0	15	112.0	36	159.0	36
South Korea	10	82	94.6	10	44.5	10	99.0	10
Japan	422.9	15	326.7	15	93.0	46	97.7	15
New Zealand	0.0	-	0.0	-	0.0	-	10.0	36
Poland	143.2	36	120.0	20	162.0	36	160.0	36
Switzerland	477.6	15	159.9	15	139.7	15	862.2	15
USA	6.0	55	134.7	15	31.1	15	116.7	15

Adopted from Josling, Tangermann and Warley (1996, p. 187).

There were also many cases of tariff-only products where the tariff reductions agreed in the Uruguay Round promised welcome access improvements, and in exporting countries this result of the negotiations has helped to create political support for the agreement. However, many of the new tariffs that have resulted from tariffication may well continue to be prohibitive even after the reductions agreed in the Uruguay Round have been made. Hence, improvement of market access in many cases was expected to result mainly from the new minimum access commitments, implemented through tariff rate quotas (TRQ) at reduced tariffs. In the negotiations, these access commitments therefore appear to have attracted more attention than the tariffs resulting from tariffication, and rather than resulting only from mechanical calculations (based on the agreed percentages of domestic consumption), many TRQ were agreed in bilateral request and offer negotiations. Overall, the volume of minimum access commitments is not very large. A politically important result was that Japan and Korea, though not engaging in tariffication for rice, at least agreed to open up their rice markets under minimum access commitments. Whereas in these two cases import quotas have been readily filled, Countries are not required, by the Uruguay Round to guarantee that tariff rate quotas will be filled. If there is no import demand at the within-quota tariffs, the minimum access commitments will not result in increased trade.

Avoidance procedures seem not to have been important in the case of export commitments. Given the fact that this was the element expected to be most important in terms of practical trade implications, it can be assumed that cross-country verification of the draft schedules was particularly meticulous in the case of export subsidies. However, not only did the base period chosen for export subsidies extend to a more recent year (1986-90). In addition, a "front-loading" provision was agreed which allowed countries to start their reduction commitments for quantities at a higher level if subsidized exports in 1991-2 were larger than in the base. This provision did not affect allowable subsidized exports in the last year of the implementation period, or thereafter. It did however raise the quantities of allowable subsidized exports significantly over the whole of the Uruguay Round implementation period. Such "front-loading" was particularly important in percentage terms in some cases where export subsidies are a small part of total exports (for example, front-loading raised the quantity commitment by 262 per cent in the case of rice exports from the U.S.). However, inclusion of this provision in the agreement was driven by the the fear of the EU that is might otherwise be forced to cut total exports of wheat by a very large percentage in the first year of the implementation period. For some important commodities a large part of world trade in major agricultural products had been subsidized in the base period. The reduction commitments accepted are often significant relative to the size of world markets, e.g. between 10 and 20 per cent in the cases of wheat, butter and cheese (see Table 1.3.2). Exceptions are rice and coarse grains, where subsidized exports are only a small fraction of world trade.

Table 1.3.2: Subsidized Exports and Aggregate Reduction Commitments, Selected Commodities

	Total Volume of Subsidized Exports in the Base Period[a]		Reduction of Subsidized Exports Between Base Period and 2000	
	Mil. metric tons	Proportion of World Exports[b] 1992/93 (%)	Mil. Metric tons	Proportion of World Exports 1992/93 (%)
Wheat	61.45	59.7%	21.09	20.5%
Coarse Grains	21.24	23.0%	4.98	5.4%
Rice	0.87	6.0%	0.37	2.5%
Beef	1.75	38.4%	0.48	10.6%
Butter	0.64	90.1%	0.15	21.6%
Cheese	0.60	64.4%	0.17	18.4%
Milk Powder	0.61	59.0%	0.15	14.7%

a) Base period is 1986 - 90 or 1991 - 92, whichever is higher (because of 'front-loading')
b) World trade excludes intra-EC trade.

Source: Adopted from Josling, Tangermann and Warley (1996).

Overall, the quantitative commitments accepted in the Uruguay Round negotiations on agriculture are not expected to result in a big step towards liberalizing agricultural trade.[11] However, this is not to say that the Uruguay Round did not make a major contribution to improving the situation in agricultural trade, in a number of regards. First, the negotiations may already have triggered agricultural policy reform in some cases. For example, it has been argued that in the EU reform of the CAP as decided in 1992 might not have occurred had the EU not felt that it needed to make a contribution to a successful conclusion of the negotiations (Coleman and Tangermann, 1997). Second, some policies were adjusted during the implementation period, examples being elimination of the rail subsidies under the Western Grain Transportation Act in Canada, and access of private companies to the importation of some agricultural products which used to be completely controlled by state agencies in Japan (Tangermann et al., 1997). Third, policy adjustments already made are locked in through the new commitments, and this will guard against backsliding. Fourth, with further reductions to be made during the Uruguay Round implementation period, more and more water will be squeezed out of existing commitments, and

[11] A quantiative analysis of projections of the impacts of the liberalization effort is provided in Section 3 below.

constraints may become increasingly binding. Fifth, the new bindings accepted during the Uruguay Round have created a better basis for future negotiations, and the next round of agricultural talks as agreed in the Uruguay Round therefore has a chance of making further progress.

1.4 Implementation of the Uruguay Round Agreement on Agriculture

Overall, implementation of the Uruguay Round Agreement on Agriculture has so far (by early 1998) occurred reasonably smoothly and without major surprises, though a number of concerns have arisen, some resulting in formal WTO disputes. Hathaway and Ingco (1996), Tangermann (1996), Cordeu, Valdés and Silva (1997), Tangermann et al. (1997), and Osorio Londoño (1997) have surveyed the implementation process. In that process, the newly established Committee on Agriculture plays an important role, not the least by gathering information through extensive country policy notifications. The notification process generates an enormous wealth of information on countries' policies. Fortunately, the decision was taken to make the notifications available to the general public, and this will also provide useful information for research.[12] Based on these notifications and other information, countries discuss each other's policies in the Committee, and this creates a new degree of transparency. Work in the Committee is also expected to generate an important basis for the next round of agricultural negotiations. A process of "analysis and information exchange" started in the Committee in mid-1997, based on "non-papers" on selected issues considered important for future negotiations.

Tariffication has required major technical adjustments of border regimes in many countries. For example, the USA had to eliminate its "Section 22" import quotas for WTO members, and the EU had to convert its variable levies into tariffs. However, as expected, tariffication has not so far resulted in a significant growth of imports in most cases. In some cases (e.g. in the EU, for cereals, fruit and vegetables; in Japan for pork) and for differing reasons, tariffication has not fundamentally changed the nature of the previously existing non-tariff measures (Tangermann, et al., 1997). Developed countries have generally tended to make full use of their bound tariffs (with New Zealand being an exception). Developing countries, with their often high ceiling bindings, have in many cases applied tariffs below bound levels. They have a tendency; in particular in Latin America, to adjust tariff levels inversely to

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[12] The WTO Secretariat, commendably, makes the notifications accessible through the internet on the WTO website.

fluctuations in world market prices in order to stabilize landed prices of imports. In South Asia, residual quantitative restrictions based on the balance of payments exception (GATT Article XVIII) still play a major role. The Special Safeguard Provisions have occasionally been used, mainly by the EU and Japan. However, except for the case of pork in Japan, no major controversies have so far arisen out of these provisions.

The full binding power of the new export subsidy commitments, expected by most observers to be the most constraining element in the new WTO framework for agriculture, has already been felt in some cases (e.g. cheese in the EU). However, high world market prices for cereals in much of the implementation period so far have meant that policies in this important product sector have not yet been much constrained. In two cases (Australia and Canada), previous dairy policies have been re-instrumented, without much harm to domestic producers, such that they, arguably, no longer involve export subsidies as defined under the Agreement. However, in the case of Canada's new dairy regime, consistency with the WTO rules on export subsidies has already been questioned in the WTO principally by the United States and New Zealand. In order to ease its already binding constraint on export subsidies for cheese, the EU has introduced a regime whereby processed cheese can be produced outside the EU customs territory, benefiting from export subsidies on butter and skim milk powder (two products where constraints were not yet binding). This case, too, has lead to a WTO dispute. In a much publicized case, Hungary claimed that its export subsidy commitments were based on wrong data and therefore too restrictive and granted subsidies beyond the original commitments. This resulted in a formal WTO dispute, and in the end a waiver was granted allowing Hungary defined extra amounts of export subsidies until the year 2001 (but not thereafter).

Another not unexpected outcome of the implementation so far, is that many agricultural state trading enterprises have not fundamentally changed their operations. For example, in Japan private traders are now, in principle, allowed to import those products that have undergone tariffication. However, in practice the volumes imported by them have remained small compared to imports of the same products effected by the Agriculture and Livestock Industries Corporation. In South Asia, too, state trading enterprises still play a major role in agricultural imports. On the export side, the Canadian Wheat Board and the various state trading enterprises in Australia and New Zealand were not expected to, and did not, change their operations as a result of the Agreement.

In the new dispute settlement procedures agreed in the Uruguay Round, agriculture has continued to play a significant role, though somewhat less than before. Under the "old" GATT, according to a count by Hudec (1993, p. 327), out of a total of 207 GATT complaints between

1948 and 1990, 89 complaints (i.e. 43 percent) related to agricultural products. In the first roughly three years after the Uruguay Round (by October 20, 1997), among a total of 73 distinct cases, 17 complaints (i.e. 23 per cent) dealt with agriculture (Hudec, 1997). However, only a minority of these disputes related to core elements of the Agreement on Agriculture. This was also true for the two most prominent cases, both of which were directed against the EU. One of them related to quota administration under the EU banana market regime. The other one, against the EU ban on the importation of beef produced with hormone, dealt with provisions under the new Uruguay Round Agreement on Sanitary and Phytosanitary Measures. Implementation of this Agreement so far, and of the beef hormones case, is surveyed by Roberts (1997). The EU has lost in both cases (after both had gone to the WTO Appellate Body), and is expected to adjust the policies concerned.

Overall, experience with agricultural disputes following the Uruguay Round can be said to have been reassuring, in three regards. First, the new agricultural provisions and commitments that were established in the Uruguay Round have not (so far) resulted in a sudden upsurge of complaints. Indeed, a number of complaints had remained in the waiting line until the Uruguay Round was finished, and in that sense the number of complaints which had to be dealt with immediately after the Round may not be representative of the longer run amount of agricultural disputes in the WTO. Second, the new SPS Agreement has allowed some cases to be brought before the WTO that might have been very difficult to resolve bilaterally. Third, the new rules on dispute settlement agreed in the Uruguay Round have been successful in the sense of reducing the time required to reach conclusions, and of not allowing countries which were found in violation of their obligations to block the adoption of panel reports. The improved effectiveness of the new dispute settlement process in the WTO may, also, have helped to avoid some formal disputes and to settle differences bilaterally through consultations. However, the real test for the validity of the new regime will come only when countries have to adjust those measures that were found to be inconsistent with their obligations.

2 Major Agricultural Issues Negotiated in the Uruguay Round

The Uruguay Round was supported by an unprecedented amount of economic analysis and discussion. Section 3 provides a brief survey of some of the quantitative studies that contributed to the Uruguay Round negotiations. This section discusses the economic issues and reasoning surrounding the three major policy elements dealt with in the Uruguay Round and in other trade agreements.

Trade agreements have traditionally dealt mainly with tariff reductions, and as noted above this was indeed a major element of the Uruguay Round. However, given the variety of non-tariff import barriers used in agriculture, it was clear that tariff cuts alone would be unsatisfactory. The concept of tariffication was proposed and implemented to deal with this complicated issue. Tariffication, minimum access, tariff cuts and the maintenance of current access comprised the package of import access tools that were used in the Uruguay Round negotiations and subsequently in NAFTA. Market access is discussed next in subsection 2.1.

As noted in Section 1, the immediate trade effects of tariffication were expected to be rather small in most cases. In fact, throughout the Uruguay Round negotiations, it was export subsidy programs that were perceived to be the most disruptive policy practiced by the major trading nations of temperate zone products. Economic analysis of agricultural export subsidies has been extensive over the past decade, but most of this research has dealt with the domestic welfare consequences of such policies. Our review, in subsection 2.2, deals with only some of these issues and focuses mainly on trade consequences and the role of the export subsidy battle in trade negotiations.

The third leg of the Uruguay Round was an attempt to use the multilateral negotiations to limit directly the use of trade distorting domestic programs. Section 2.3 discusses the economic logic of this attempt and how the Uruguay Round dealt with the complexity of underlying policies and programs.

2.1 Economics Issues of Market Access Policy and Tariffication

Agricultural trade barriers proliferated in the decades leading to the Uruguay Round. Non-tariff barriers were generally not accepted for trade between GATT members in other goods trade and tariff rates fell steadily through successive GATT negotiation rounds. In agriculture, many tariffs were also bound in the GATT, though less than for industrial goods. Among wealthy countries and GATT members, new or increased import barriers in agriculture mainly took forms other than simple import tariffs (see above, Section 1.1). Nations applied non-tariff barriers to either exploit the gray areas of the GATT, or in the context of explicit exceptions from broad GATT commitments. The use of variable levies by the EU and the use of Section 22 quotas by the United States are examples of these two cases.

Tariffs and non-tariff barriers have much in common. Import tariffs directly raise the price of potential imports and allow larger quantities of domestic import substitutes to be sold at

higher prices than otherwise. Agricultural non-tariff barriers also can further the interests of domestic producers by limiting directly the quantity of imports of competing goods. An equivalence of tariffs and import quotas (as well as other non-tariff barriers) under certain simple market conditions is well known, and was shown to exist, and used for quantitative measurement of protection rates, already in the famous Haberler Report (GATT, 1958). However, the "equivalence" between tariffs and import quotas applies only under limited conditions. For example, when there is potential monopoly power in the domestic market, equivalence breaks down because a tariff continues to limit prices charged in the domestic market, whereas a quantitative import barrier allows the domestic supply more scope for monopoly pricing (Bhagwati, 1970). In agriculture, we may often assume competition applies, but nonetheless, differences in consumer or seller consequences remain. For example, tariffs may provide less protection to the domestic industry than "equivalent" quantitative limits under variable domestic or world prices (Vousden, 1990).

Tariffs and non-tariff barriers also differ in broader effects that are important in many applications. For example, government revenues received from tariffs and quotas are likely to differ. The variety and complexity of non-tariff barriers mean they are less transparent in their effects than tariffs. Publication of tariff schedules allows easy comparison across tariff lines. This transparency was a key argument for tariffication applied in the Uruguay Round Agreement, even though these tariff rates do not necessarily provide accurate assessments of rates of protection or domestic price effects or broader consequences for consumers.

Direct limits on the quantity that may be imported are also simple and straightforward border barriers. However, quantitative import restrictions may be less transparent than tariffs. Import quotas may be sold, in which case they may provide government revenue, or they may be given away to importing firms or exporters. A variety of mechanisms have been used to ration access in the case of quotas or quota-like programs (for tariff rate quotas, see below, Section 4.4). This rationing means that, under quotas, the government in the importing country continues to control sources or other characteristics of imports to a large degree.

Other agricultural import measures include variable levies, as practiced most prominently by the European Union, and the so called "voluntary export restraint" (VER), which was used, for example, by the United States and Canada to limit beef imports or by the EU to constrain manioc imports from Thailand. Under a pure variable levy scheme, the import duty varies inversely with the border price such that the imported price inclusive of the levy is held constant. The EU variable levy policy restricted imports to allow the domestic price support policies of the EU to operate without interference from international market conditions. A variable levy uses an

adjustable tariff to achieve domestic price objectives that would not be possible with a pure tariff or import quota. A domestic price-band policy is similar to a variable levy. In this case, a variable import tariff is added to the border price in order to keep the inclusive price within a proscribed range. Chile has used a price band policy, for example, for wheat, and other countries in Latin America continue to use price bands after the Uruguay Round.

Under a VER an importing nation uses various trade or other pressures to encourage trading partners to "voluntarily" limit shipments to the import market. Sometimes these import barriers are informal, or ad hoc, such as when Canada agreed to a VER for wheat sales to the Unites States in 1994 (Alston et al., 1994). In other cases, the VER policy is a permanent feature of law. For example, the U.S. meat import law, which was in force for more than two decades, stated that if imports were projected to exceed a trigger quantity then an import quota would be imposed that was ten percent below the trigger. Major importers were then offered the opportunity to negotiate an import amount that was above the quota quantity, but below the trigger. With this policy in place the quota itself was never binding, but major exporters (Australia and New Zealand) did often “voluntarily” restrain their exports to the US market (Sumner, 1995).

Faced with a variety of border barriers, the Uruguay Round negotiations focused on the standardization of import regulations such that all barriers were converted to ad valorem or specific tariffs at a rate calculated to provide “equivalent” domestic protection to the non-tariff barrier that was replaced. The rationale behind tariffication was to provide transparency in border measures and a basis for further tariff reductions in the next rounds of multilateral trade negotiations.

In a world with variable prices and a large array of product qualities and other characteristics that fall within tariff lines, the tariff equivalent concept is difficult to apply. The result of the URA tariffication requirement has been a set of new tariffs that were quite high by objective standards, and may in some cases have provided more protection than the non-tariff barriers that they replaced (see above, Section 1.3). Recognizing this tendency, the Agreement also provided for minimum access quantities that would expand gradually over time, for gradual reductions in all tariffs, including the newly created ones, and for a broad principle that access could not be lower following the agreement than it was before the agreement.

Most observers agree that tariffication was a major accomplishment of the URA. Even starting from high and inflated initial points, if tariff reductions are maintained at the URA average rate of six percent per year beyond the current implementation period, most agricultural

border barriers will be zero by 2013, and free trade in agriculture will follow a few years later (IATRC, 1994) and IATRC (1997). As with any phased-in reform, staying on the reform path is key to success.

2.2 The Role of Export Subsidies in Trade Negotiations

To a significant extent, the Uruguay Round negotiations on agriculture were driven by the grain trade war between the United States and the European Union. Increased price support and export subsidies, and other developments in Europe, caused the EU to shift from being a major grain importer to becoming a major export competitor for the United States. This, plus the residual from a 1980 embargo, exchange rate movements and high United States price supports caused a drop in U.S. exports (USDA, ERS, 1986). The result was a renewal of U.S. export subsidies targeted specifically at markets important to the EU. The United States explicitly tied its use of export subsidies to EU subsidies and discussed trade agreements in the context of multilateral "disarmament" in a trade war.

Often export subsidies have been used as a complement to other trade distorting farm programs, in particular as a mechanism to shift production surpluses off the domestic market while maintaining high producer prices. That is, in agriculture at least, export subsidies have been used mainly because other policies created domestic production that could not be sold at high policy-created domestic prices. Examples include the CAP of the European Union. Further, programs to shift out the demand curve by subsidizing, or otherwise promoting, exports can substitute for programs that shift back the supply curve by requiring land to be idled. Examples include wheat policy of the United States from 1985 to 1995.

For some countries, explicit export price subsidies are the most important part of a package of export assistance that includes credit guarantee programs, subsidy for international promotion, and food aid. Each of these policies uses government assistance to attempt to increase exports; they differ in the form of the aid, the international market that they target and their effectiveness. They are also treated differently in international agreements (Sumner, 1995; USGAO, 1993; Ackerman, Smith and Suarez, 1995; Smith and Lee, 1994; and Trostle et al., 1994).

Export subsidies were a part of modern farm policy that began in the 1930s. In the United States, the Agricultural Adjustment Act (AAA) of 1933 applied export subsidies to wheat and wheat flour. Then, under Section 32 of the AAA Amendments of 1935, 30 percent of tariff receipts were used to encourage the export or domestic consumption of agricultural commodities

(Johnson, 1950). Export subsidies have also been authorized under various *ad hoc* schemes and agreements such as the International Wheat Agreement of 1949. In that case, the domestic price support for wheat was above the maximum export price allowed under the agreement. The government provided the difference between the domestic price and the agreed international maximum export price (Benedict and Stine, 1956; and Ackerman and Smith, 1990).

With its CAP, the EU has been the most inveterate recent user of export subsidies. Throughout the period of negotiation of the URA, the CAP maintained domestic prices above world prices and protected domestic producers with variable levies or other import barriers. EU exporters were given a rebate on exports that was adjusted to world market conditions on a regular basis. The EU set high prices for domestic consumers and producers alike, while it expanded exports. These basic policies were used for meats, dairy products, grains, and many other products such as fruits and vegetables. Export subsidy policy also included programs to compensate food manufacturers for high priced domestic ingredients (Gerken, 1997).

Canada's major export subsidy scheme, under the Western Grains Transportation Act, provided shipping subsidies conditional on export until these were eliminated in response to budget pressure and URA requirements (Barichello, 1995). These Canadian subsidies were a part of the context, but the main trade battle motivating Uruguay Round negotiations was between the United States and the EU.

In response to EU programs and a loss in export market share in the early 1980s, the United States introduced a new round of export subsidies under the Export Enhancement Program (EEP) and related programs (each with euphonious acronyms). The EEP began under the continuing charter authority of the Commodity Credit Corporation (CCC). It was subsequently authorized under the 1985 Farm Security Act (FSA). At first the EEP provided export subsidies in the form of commodities from CCC inventory, but as these inventories became depleted the program continued by providing cash subsidies. The Dairy Export Incentive Program (DEIP) was also authorized under the 1985 FSA; the Sunflowerseed Oil Assistance Program (SOAP) was authorized in 1988; and the Cottonseed Oil Assistance Program (COAP) began in 1989. The importance of export subsidies varies widely even among the commodities to which they have been applied. (Ackerman and Smith, 1990); Ackerman, Smith and Suarez, 1995); Trostle et al., 1994); and Gardner, 1996).

As noted, a key target for the EEP was the EU export subsidy program. (For an early discussion, see de Gorter and Meilke, 1987.) Because the EU provided subsidies on the total amount of its wheat exports, anything that lowered export prices in the markets in which they

participated caused the EU to make higher outlays to maintain exports. There is some evidence that the budget costs of EU export subsidies were higher because of U.S. export subsidies. Note, however, lower export prices also reduce the direct benefit of export subsidies for the United States wheat industry.

Policy pressure on the other subsidizing exporters may co-exist with large export gains by the United States if the expansion of U.S. exports replaces foreign exports, and the export price declines little. In this case, the missed export sales by foreigners are reflected mainly in increased stocks or reduced production in the foreign country (EU), but not so much in increased budget outlays for subsidies in other exporting countries. There is some evidence that this occurred in Europe in the early 1990s.

Using export subsidies as a negotiating tool makes sense only if the degree of pressure placed on foreign governments from the export subsidy is intense enough to significantly affect the path of policy reform. The intensity of the pressure depends on how much the foreign decision-makers perceive that the competitor's subsidy reduces prices in international markets or reduces the size of the export market. There was substantial discussion in the late 1980s and early 1990s that the EU felt the pressure of the U.S. EEP program. Anania et al. (1992) were skeptical about the EEP success and argue that, at least in the early years, EEP hurt exporters other than the EU, and provided little help to the United States wheat industry. Their argument was, in essence, that by dumping stocks on the market, the EEP simply drove down all wheat prices, including US domestic prices. This argument could have been true only until the wheat stocks were depleted in the first two years of EEP operation, and even then only if one assumes that government stocks would not have been released on the market without the EEP. Paarlberg (1985) argued that the extra cost to the EU caused by EEP was too small to trigger policy reform in the EU. Moyer and Josling (1990), however, have shown that rising budgetary expenditure on the CAP, as resulting among others from U.S. export subsidies, was a central factor in decision making on CAP reform. Vahl (1996) claimed that pressure on the CAP exerted by the United States was strongly instrumental in driving the EU to the negotiating table in the Uruguay Round.

Golberg and Knetter (1997) use some relatively simple time-series regressions in an attempt to measure the contribution of the EEP to U.S. wheat prices, supplies, and export quantities. Their results suggest that the impacts of the EEP on U.S. prices and U.S. market share were both small and that exchange rate movements were behind world wheat market dynamics in the 1980s. Their results also do not support the idea that EU export subsidies for wheat played a major role in lowering the U.S. export share. The approach is based on time-

series behavior over a relatively short period and may miss complex structural changes induced by policy shifts. And, of course, these results do not counter the idea that perceived EU budget costs or export quantities were affected by U.S. export subsidies

As the EEP matured, the explicit trade policy objectives were refined. The 1990 Food, Agriculture, Conservation and Trade Act (FACT), which was passed as the Uruguay Round seemed stuck at an impasse over agriculture, explicitly required the use of the EEP and related programs to counter "unfair" trade practices. Further, the 1990 Omnibus Budget Reconciliation Act (OBRA) tied spending for export programs directly to progress in the Uruguay Round. The Act required that spending on export programs increase if the Round was not successfully concluded by June 1992 (USDA/ERS, 1991). This threat did not succeed and so the required additional budget allocations were made. In its implementation of the URA, the United States government pledged to use the EEP program to the fullest allowable extent as a tool to continue to subsidize politically powerful industries and to continue pressure on the EU (U.S. Congress, 1994).

Any evaluation of a complex commodity policy hinges on what other policies and market conditions are expected to hold independently of the policy evaluated. In order to evaluate export subsidies, one must first consider which income and price support programs are in place so that second best considerations may be included in the analysis (Gardner, 1983; Alston and Hurd, 1990; and Alston, Carter and Smith, 1993). One must also consider whether other policies are exogenous or are likely to respond to adjustments in the export program. In the United States, the EU and other countries, domestic policies changed several times during the life of the ongoing export subsidy programs. In addition to alternative policy responses, evaluation of the effects of export subsidies depends on key supply and demand parameters. It is well accepted that some subsidy will always be paid on export sales that would have occurred even without the subsidy. In these cases the subsidy was unnecessary and a pure gain to the foreign buyers. Reasonable estimates of "additionality" for United States export subsidies have ranged from as high as 40 percent to close to zero. (See Abbott et al., 1987; Anania et al., 1992; Alston, Carter, and Smith, 1993; Dutton, 1990; Gardner, 1996; and especially USGAO, 1994, for empirical literature and simulations on these topics.)

The literature supports the conclusion that export subsidies generally reduce national welfare, at least as social costs and benefits are conventionally measured. Export subsidy programs, as they are currently operated, do provide benefits to specific farm interests, but they do so at significant cost to the national and world economy. Further, in most cases, larger benefits could be delivered to farmers, at smaller budget and economic costs, if export subsidies

were not used. In practice, the conceptual possibility that export subsidies could be one part of a policy mix that maximized benefits to farmers for a fixed economic cost, does not seem to apply (Hanson Vogel and Robinson, 1995; Sumner, 1995; Alston et al., 1997).

As with import barriers, the basic tools available to deal with export subsidies were relatively clear and the questions for negotiators related to definitions, modalities, and time schedules. The Uruguay Round disciplines require a phase down in both the quantities subsidized and the value of direct export price subsidies on a commodity by commodity basis (sometimes commodity groups), but not on a tariff line basis. These disciplines were chosen based on considerable economic analysis, including review of international markets in the 1980s and early 1990s and projections of the commodity price impacts of required policy reforms (Sumner, 1992). Under normal supply and demand conditions the disciplines were expected to limit EU exports and thus encourage policy reform by the EU. This in turn would allow export expansion and higher prices for other exporters, including the United States and members of the Cairns group. Much of the academic literature on export subsidies dealt with how these policies affected domestic welfare and was therefore less directly relevant to the negotiations.

2.3 Reform of Domestic Subsidies in a Trade Context

In the run-up to the Uruguay Round, trade rhetoric included not only trade policy and trade effects, but also accusations about the whole scheme of farm subsidy policy pursued by developed countries (Miller, 1986). Particularly, with the widespread use of the PSE concept, agricultural or trade ministers and other farm leaders latched on to the idea that, by stimulating domestic output, domestic subsidies would reduce imports or expand exports, even without border measures (USDA, ERS, 1989; and OECD, 1987).

The economic logic of the focus on domestic subsidies was straightforward. Domestic production subsides can and sometimes do substitute for border measures to some degree. The GATT and individual country trade laws had long recognized the trade effects of domestic subsidy policy. Provisions related to nullification and impairment (of tariff bindings) limited a country's use of indirect measures that reduces the trade benefits legitimately expected from a trade policy concession. In the GATT, a Subsidies Code had also been agreed upon during the Tokyo Round, and antidumping and countervail law also applied to trade effects of domestic subsidies (IATRC, 1990). For one specific case study see Moschini and Meilke (1992).

The linkage between border measures and domestic policies was also explicit in waivers and exceptions from broad GATT principles. For example, the famous Section 22 waiver of the United States explicitly acknowledged the primacy of domestic support policy and allowed the United States to apply quantitative import restrictions in cases in which imports threatened the effective operation of internal farm support programs. GATT Article XI:2(c) allowed members to use import quotas to limit imports if domestic production was effectively restricted through internal programs (see above, Section 1.1). Both of these GATT provisions acknowledged the close interaction between internal and border measures.

The two-way connection between internal policies and border measures was acknowledged, and even incorporated in trade policy debate and law, well before the Uruguay Round. However, as the Uruguay Round progressed there was a widespread sense that the failure to include the full set of farm policy instruments directly within GATT limits had allowed conflict between border measures and internal support to minimize the accomplishments of previous GATT rounds. The idea was to use multilateral negotiations to reduce all support for agriculture and thus directly limit the trade effects of internal subsidies. Failing better measures, outlays for farm programs were sometimes taken as a proxy for subsidy impact, so that, for example the United States would point to the size of the EU agricultural budget as evidence of trade distortion. When Producer Subsidy Equivalent (PSE) and Consumer Subsidy Equivalent (CSE) data became available from the OECD and the USDA, these figures were used despite regular warnings that the PSE concept did not apply directly to trade distorting policies (USDA, ERS, 1989, and see references to the empirical literature below in Section 3).

Some trade policy participants, a number of advisors, and others had an additional rationale for including domestic support measures in agricultural trade negotiations. These observers emphasized the negative welfare effects of farm programs generally, and were dismayed at the political success of program supporters. This group reasoned that if domestic farm programs could not be defeated directly in the domestic political realm perhaps they could be dealt with indirectly in the context of trade policy reform. In Europe, the farm interest opposed both trade liberalization and limits to domestic subsidy, and most farm subsidy was tied to trade measures anyway. The idea was to include internal supports to limit how much governments could substitute domestic subsidy for export subsidy and import barriers (Josling, Tangermann and Warley, 1996).

Domestic support programs mostly conform to a few basic policy types, but they have a withering variety of specific forms. This variety was one of the problems that plagued the GATT negotiators in devising effective modalities for constraining domestic support. It was

clearly impossible to specify particular policies to be reformed in enough detail to capture all the various ways domestic programs subsidize agriculture. One idea was to apply an index that summarized the trade consequences of the whole mix of agricultural policies for a commodity. However, the construction of an indicator to aggregate the trade effects of internal programs proved illusive in practice. It is not trivial to summarize trade or even production subsidy effects of commodity policies without detailed knowledge of supply and demand parameters, and these are known, at best, only as rough approximations.

Various aggregate measures of policy-induced distortions have been defined and analyzed. One of the most widely discussed recently is the "Trade Restrictiveness Index" (TRI) of Anderson and Neary (1992, 1994 and 1996). Anderson, Bannister and Neary (1995), Draaisma and Fulponi (1996), and Salvatici, Carter and Sumner (1997) discuss the TRI in an agricultural policy context. The idea of the TRI is to aggregate policies, using a uniform tariff index, according to their effect on a measure of domestic welfare of the country imposing the policy. Two sets of policies will have the same TRI if they impose the same aggregate welfare loss on the consumers, producers and taxpayers in a country. The TRI weighs individual policies according to their welfare consequences and includes both border measures and distorting domestic programs, while giving no weight to pure transfers that do not distort markets. As a welfare distortion index the TRI is built on relatively simple foundations and the analysis would be much more complex if national market power, market failures and public goods were added to the mix.

The TRI has appealing properties, but is does not seem to be suited for use as a negotiating tool or modality for international agreements. Besides its operational complexity, the TRI has a more fundamental characteristic that limits its use in an international context. Despite its name, the TRI seems to have little to do with trade per se, and it clearly is not an index of how much trade is restricted (Salvatici, Carter and Sumner, 1997). Two sets of policies with the same TRI can have quite different consequences for trade flows or market prices. Further, because the TRI is oriented to the home country welfare, it does not provide a guide to the degree that policies affect a country's trading partners. One can consider the "mercantilistic TRI" which aggregates policies based on the impact on import flows. In this context, one can also conceive of something like a Trade Partners Welfare Index (TPWI), built on the same conceptual foundation as the TRI, that focused instead on the welfare consequences of policies for a nations' trade partners. Using the TPWI, negotiators could agree to reform policies to lower the welfare consequences imposed on other countries on a non-discriminatory basis. Of course, to be operational such an index would need to be transparent and accepted as a reliable measure of

costs imposed externally. Because the TRI depends on a complex model and parameter estimates about which there is little consensus, we are a long way from implementing such an index in trade policy negotiations.

The most important practical problem of applying aggregate measures is that the trade or subsidy element of policy measures depends on world and domestic market prices, and these vary in accordance with climate driven crop conditions and policies in other countries. For example, the PSE, which aggregates budget outlays and differences between domestic prices and world prices, varies widely from year to year even when domestic support prices do not change. No country can make serious, credible commitments with respect to an index which it could control only, if it was prepared to adjust domestic support prices continuously to changing conditions on domestic and international markets.

Under the Uruguay Round Agreement, the total of those domestic support policies labeled as "trade distorting," in the sense that they tend to increase exports or reduce imports, must be reduced gradually from a base period. Total support in this category is measured by a single Aggregate Measurement of Support (AMS). The AMS is a relative, though a rather distant one, of the PSE measure as originally developed by Josling for FAO (FAO, 1973 and 1975) and later adopted by OECD in its Ministerial Trade Mandate (see above, Section 1.2). Differences between the two types of measurement, and the potential for and history of their use in the Uruguay Round have been discussed by Tangermann, Josling and Pearson (1987); IATRC (1990); van der Hammersvoort (1994); Josling, Tangermann and Warley (1996); and Silvis and van der Hammersvoort (1996). Design of quantitative measures of protection and support has a long history in modern economics, and is one of the prime examples where economics has made a direct contribution to international negotiations and agreements. Relationships between and comparative advantages of the various protection measures, including the PSE, are discussed, among others, by Scandizzo (1989), Josling and Tangermann (1987), and Laird (1996).

The AMS as agreed in the URA includes, in addition to direct payments, market price support provided through administered domestic prices, calculated against fixed external reference prices. One of the differences between the AMS and the PSE, hence, is that the AMS is not influenced by movements in international commodity prices. Another important difference is the fact that the AMS includes the gap between domestic and international prices only if there is an administered domestic support price, while the PSE includes the price gap also if it is implemented through border measures, i.e. tariffs and export subsidies. Though the AMS (like the PSE) is calculated on a commodity-specific basis, the constraint agreed in the URA applies only to its sector-wide aggregate. Hence, unlike for border measures, the internal

support disciplines were applied to the aggregate of all commodities. Support for some commodities could be increased so long as support was reduced enough for other commodities.

Two sets of internal support policies are not in the AMS, and they are referred to as "green box" and "blue box" measures. The “permitted” policies in the green box are many and varied. Conservation programs, research and extension, direct payments meeting strict criteria, and certain crop insurance and disaster aid programs are among those policies likely to qualify for the green box. These policies are also exempt from countervailing duty actions and such GATT challenges as nullification and impairment actions, and serious prejudice actions. The blue box exempts from the requirement for reduction in total support for the implementation period certain direct payments that are made on a fixed quantity and on less than base period production.

There are several reasons why internal support disciplines were less restrictive than those devised for border measures. First, the practical effects on trade of most internal support programs are relatively small compared to direct trade barriers or subsidies (Sumner and Hallstrom, 1997). Second, it seems nearly impossible to devise schemes to actually restrict indirect subsidies that have tangential trade effects. Third, the national political support of programs such as crop insurance and environmental subsidies is much larger than the international support for restricting them. Therefore, these programs were accepted in the green box, even though the supply effects of some of the policies may be as large as those of some direct income and price subsidies. However, it should be noticed that all policies for which green box status is claimed must also meet, in addition to the specific characteristics of the green box measures listed in the URA, some general criteria, in particular "that they have no, or at most minimal, trade distortion effects or effects on production" (Agreement on Agriculture, Annex 2:1). It will be interesting to see how strictly these general criteria are applied when and if it comes to WTO disputes over the green box status of some of the more questionable measures.

The so-called "peace clause" places restraints on increasing commodity specific subsidy rates. In particular, if direct payments conform with the agreement, and if the level of support is not raised above the level that applied in the 1992 marketing year for a specific commodity, then these measures are exempt from GATT actions against subsidies (Article XVI) or nullification and impairment. Direct payments exempt from reduction, and other internal supports subject to reduction, are not exempt from countervailing duty actions. The "non-distorting" permitted (green) policies are exempt from countervailing duty actions and other GATT challenges (for example, nullification and impairment actions, serious prejudice actions).

The specific language in the Uruguay Round on "peace" was among the most contentious elements. A key issue in interpreting the peace clause is to consider whether it can be used to protect trade practices that would have been subject to GATT disciplines before the Uruguay Round. Does the peace clause allow trade to be more distorted under the Uruguay Round rules than before? The distinction between green internal support policies and the category of non-reduced subsidies may become important in this regard.

The result of this approach to internal support has been that reduction commitments for internal support have been largely irrelevant for the major agricultural nations of Europe, North America and even Japan. (For documentation for the United States and other rich countries, see OECD, 1995; USDA/ERS, 1996; Young and Westcott, 1996; and Nelson, 1997.) Consistent with findings for developed countries, Konandreas and Greenfield (1996), find that the domestic support disciplines of the URA have little impact in developing countries. They argue that even though the URA provisions constrain developing countries not to exceed the low amounts of trade distorting domestic support that they have provided in the past, these limits are unlikely to be binding. The basic argument is that budget pressure, and an effort to meet economic efficiency goals, would temper trade-distorting domestic support for agriculture even without the URA. The financial “melt down” in East Asia in 1997 makes the prospects for large subsidies even less likely now.

Silvis and van der Hamsvoort (1996) argue that the AMS played a relatively minor role in the URA. They note that the PSE concept was inapplicable in trade negotiations and so the AMS idea was only used in the internal support disciplines, and most of those were designed to be non-binding. The OECD, which championed the use of an AMS in trade negotiations, disagrees and argues that inclusion of these disciplines limits the choice set of potential policies and will thus “profoundly influence future policy developments…” (OECD, 1995, p. 45). The OECD work, though, does not document that the “limits on the choice set” were in a feasible range and so it does not show that the URA limits have more than a theoretical effect.

3 Quantitative Analysis of Agricultural Trade Liberalization

In the period leading up to serious negotiations in the Uruguay Round, agricultural economists invested significant resources into projecting likely effects of trade liberalization in agriculture. Studies vary in degree of policy detail, commodity detail, international coverage, economy wide coverage, and specific questions posed, as well as in many details of

specification. Nonetheless, it is useful to compare modeling approaches and results. One of the early published attempts to do this was Gardner (1989), which met with expressions of frustration from the model builders and sponsors.

The general approach of quantitative studies in this arena has been to: (1) specify a set of supply and demand equations (or their equivalent) and an equilibrium point or path; (2) include in this initial specification a set of current policies or policy "wedges" between domestic and international prices; (3) perturb the initial equilibrium by removing (or modifying) the policies or wedges; and (4) observe the new set of equilibrium quantities, prices and other variables of interest. Results may be presented as deviations from base period reality or based period model results. The results of such liberalization experiments are in the form of counter-factual economic history. To apply these counter factual historical results to the questions about the impact of future trade liberalization, one must use them to inform conjectures about what the alternative futures are likely to bring. An alternative approach is to incorporate the applied questions more fully into the modeling such that the base case is projected forward and compared to the equilibrium with the policy wedges removed at some specified future date. In this way the practical question is posed, how would the future be different if the policies were changed?

3.1 Issues for Studies Projecting Effects of Trade Reforms

The studies that were most influential in motivating and setting the terms for the Uruguay Round generally dealt with several interrelated commodity markets with explicit linkages across commodity supplies and demands. Among the best known and influential studies was that of Tyers and Anderson (1986) and (1988), which was expanded, and refined in Tyers and Anderson (1992). Tyers and Anderson found, for example, if major trading countries had liberalized trade policy for major temperate-zone farm products, substantially higher world prices would have held during the period 1980 to 1982.

Simulation studies reported in Rausser (1995), though published after the conclusion of the Uruguay Round, were based on research completed before specific proposals became available for analysis. Thus, this work considered stylized reforms of farm policy, especially in the United States. A major focus of Rausser (1995) was how economic forces may exert pressure on political institutions to lead to unilateral or multilateral agricultural policy reform. This is pursued in a framework under which policies are classified as either contributing to additions to

national or global welfare (as conventionally defined) or contributing to redistribution, with a loss of national or global welfare. Agricultural commodity trade barriers generally fall into the redistribution class.

Income distribution often plays a large role in the political economy of the trade negotiations. Levy et al. (1994) and (1995) concentrate on the distributional impacts of trade policy reform in a general equilibrium model with the economy divided into urban and rural sectors. In their results the main beneficiaries of the trade policy reform are the wealthy in both urban and rural areas.

Because of the expense and effort involved in model building and data management, major empirical trade liberalization studies have often been conducted by international or governmental organizations or research centers, or with substantial grants of government funding. Relatively early work by OECD and USDA fits this description. The work by OECD helped set the stage for Uruguay Round negotiations by helping provide internationally credible support for the notion that trade liberalization would have global benefits (OECD, 1987). (See above, Section 1.2.) The USDA modeling and analysis helped to inform decision-makers in the United States (Roningen and Dixit, 1989). Both these studies and the organizations that sponsored them aided further research also by providing data, ready access to parameter estimates and a basic model structure that was used by others (for example, Vanzetti, et al. (1994).

Neoclassical trade theory within the Hecksher-Ohlin framework is usually developed in a 2-country, 2-good, 2-factor of production general equilibrium model. Obviously, real trade policy applications do not fit neatly into the strong version of this theory, which also assumes identical production and demand parameters. Empirical trade models therefore must deviate from the simplest of theoretical structures. In this context, applied general equilibrium models attempt to provide a complete and explicit representation of the relevant economies, while abstracting from much sectoral detail. These models facilitate analysis of (1) effects of non-agricultural economy-wide policies on the agricultural sector, (2) linkages between agriculture and the rest of the economy, and (3) factor market linkages (Hertel, 1998). As Hazledine and McDonald (1992) point out, there is often a trade-off between making the model general and making the model more representative in the sector of interest A partial equilibrium modeler has the advantage of being able to concentrate exclusively on a particular sector of interest. By striving for an exhaustive accounting of economic interrelationships, general equilibrium modelers forego sectoral detail. The result may be a complete model composed of questionable parts. Improvements depend upon refining the partial equilibrium specifications of the various sectors, and an ongoing dialogue between partial and general equilibrium modelers.

Differences between sector-specific and economy-wide models depend on the application or question posed for the models. Hertel (1992) obtains quite different partial and general equilibrium projections of the response in agriculture to a liberalization of all non-CAP farm and food policies. However, when he simulated the equilibrium response of a reform in the CAP starting from a position in which all non-agricultural distortions have already been removed, the partial equilibrium and general equilibrium results were similar. If agricultural policy is being reformed within a wider setting, such at the GATT, and the policy analyst wishes to calculate the total effect on agriculture of the trade policy reform, there may be sizeable errors unless economy-wide effects are incorporated. Of course, one may include effects of non-agricultural policy reform without using a full general equilibrium model. For example, the informal agricultural sector projections of URA effects that are cited below all include (exogenous) macroeconomic impacts of the overall URA on agriculture along with endogenous effects of agricultural policy reform.

In reviewing trade liberalization results reported by 1988, Gardner (1989) expressed concern that projected impacts of reform differed widely. He was right that the array of "results" was quite wide. Although it is never clear precisely why model results differ, that they do differ is not surprising. The studies that Gardner considered in 1988 were completed before serious negotiations were underway, and individual researchers had little guidance from the negotiations about how to frame policy relevant questions. Thus the "answers" they reported responded to quite different research questions. The results are most naturally reported as percentage differences from some actual or simulated base, and if the simulation experiment differs, and the base differs, the reported "results" would differ even if models were identical. Of course, results also differ because models differ, but given the complexity of the models and the data it is just about impossible to understand the source of differences in model results. The task of reconciling models was also of limited practical interest, because none of these results were directly relevant to the eventual policy changes implied by the URA itself. Thus, there is no "reality check" on the model results either. The value of these early models was in suggesting, in broad outline, the likely direction and orders of magnitude of the impacts of trade liberalization.

Implicit in partial equilibrium modeling is the assumption that inter-industry linkages are either small enough to be disregarded or may be specified as exogenous and unidirectional. Kilkenny and Robinson (1990) demonstrate the implications of this type of inter-industry linkage by examining a general equilibrium model under various factor mobility assumptions. They find that the impact of trade liberalization on the agricultural sector in the United States depends

strongly on the degree of factor mobility, both within agriculture, and out of agriculture into the rest of the economy. This result says that rents accrue to inelastic factors of production, and reminds us that assumptions about factor markets are crucial (Robinson et al., 1993).

3.2 Projections of Specific Trade Policy Options and Agreements

As the Uruguay Round negotiations progressed, economic analysis played a role in informing the negotiators about the projected consequences of specific proposed reform alternatives. Little of that work was released publicly, rather it was used by the various negotiating teams and in discussions with interest groups in building support for the negotiations. Projections that were released were tailored to particular proposals and were based on a relatively informal mix of partial models and expert knowledge. The USDA work focused particularly on effects of multilateral reform for agricultural interests in the United States (USDA, Office of Economics, 1992). Similar work was done with respect to the NAFTA agreement (USDA, Economic Analysis Staff, 1993). The directions of impacts found in these studies were generally consistent with those in the earlier studies. At the conclusion of the Uruguay Round, the informal studies were updated and applied to the final Uruguay Round Agreement (USDA, Office of Economics, 1994). These studies all considered real proposals in detail. To do that they relied on an ad hoc combination of formal models and specific industry knowledge. They also included exogenous economy wide projections that were used to provide input on income growth in the agricultural models. (See also Helmar, et al., 1994; Rossen et al. (1994) and Ingco, 1995.)

Projections of the effects of the Uruguay Round for individual commodities markets could apply detailed knowledge of specific policies and provide reasonable estimates, even if the scope of the analysis was limited. Such research represents a sound approach for commodities that were, in some sense, insulated from broader effects that are important in integrated grain, feed and livestock markets. Rucker, Thurman and Borges (1994) consider the effects of the Uruguay Round for peanut markets and capitalize on their detailed specification of the policies involved.

After the completion of the Uruguay Round Agreement, there were a number of simulation studies that assessed its impacts on global agriculture. Sharma, Konandreas and Greenfield (1996) presented a synthesis of the results from five models that were used to assess the impacts of the URA. As in the studies conducted prior to the Uruguay Round, results vary from model to

model. This is no longer due to differences in the reality to which they are applied. It turns out, however, that the modelers chose to specify the URA in quite different terms and, of course, the models also differ in closure, breadth, specificity, levels of aggregation, and parameter specification.

Of the models considered by Sharma, Konandreas and Greenfield (1996), the Agriculture Trade Policy Simulation Model (ATPSM) from UNCTAD (1995), and the World Food Model (WFM) from FAO (1995) are multi-commodity partial equilibrium models. The Rural-Urban North-South (RUNS) model from Goldin and van der Mensbrugghe (1995), the FMN model, done for the World Trade Organization by Francois et al. (1995), and the Multi-Regional Trade Model (MRT), by Harrison et al. (1995), are general equilibrium models.

The partial equilibrium models include results for many countries that have small global effects. ATPSM includes 145 countries, while WFM covers over 130 countries and 10 country aggregates. The general equilibrium models are more aggregated across countries. The models also differ in how they handle tariff reduction, market access quantity requirements, exports subsidies, and domestic support. Tariff reduction is incorporated into the WFM, RUNS and MRT models by using PSEs. Tariff reduction is then achieved by reducing the market price support component of the PSE. All of the models incorporate export subsidy restrictions, but two of the models used quite rough approximations to these commitments. In the RUNS model, per unit export subsidies were first translated into *ad valorem* rates, in the MRT model export subsidy restrictions were treated as reductions in expenditures on export subsidies. Domestic support disciplines are incorporated in ATPSM, RUNS, and MRT, while the remaining two models assume they are non-binding. Minimum access requirements are ignored in the RUNS model and MRT.

Table 3.2.1 summarizes the projects changes in world market prices for several commodities covered various models that examined trade liberalization. All the results except Tyers and Anderson (1992) were specified to related to the results of the Uruguay Round agreement. i Modeled summarized include the WFM, ATPSM and RUNS models that are reviewed in Sharma et al. (1996). Table 3.2.1 also includes, results from Vanzetti, et al. (1994), Tyers and Anderson (1992), and the less formal projections by the USDA, Office of Economics (1994). Almost all the price changes are positive and those for the most protected or subsidized sectors tend to rise most as some of the protection is removed. Of course that statement could have been made with no model and any model that produced a contrary result would likely be considered suspect.

The most striking feature of these results is that the projected percentage price effects differ widely from model to model. The models differ in which price serise they project, the exact time period and other characteristics. The differences in price projections must be due to a complex mix of model specification and empirical experiment. These differences do not seem to be due to model type (CGE or partial equilibrium) or any other easily identified characteristic. Each of the models results are defensible within the context of that model and a detailed analysis of each model and associated results could probably account for differences across models. Nonetheless, without specialized knowledge of model particulars, or prior knowledge about which model to trust most for which specific question, readers are left without any real guidance about the projected effects of Uruguay Round trade liberalization on commodity prices.

Table 3.2.1: International Market Price Effects of Trade Liberalization: A Summary of Projections

Commodity	Model Projections[a] (Percentage Changes) T&A	WFM	ATPSM	RUNS	ABARE	USDA	FAPRI
Wheat	2.6	6.9	1.0	6.3	6	4.5	18[b]
Course Grains	-4.3	4.4	3.2	3.2	6	2.5	9[b]
Rice	4.1	7.3	0.7	0.8	7	12.5	3[b]
Cotton	na	Na	Na	-0.3	3	1.5	Na
Sugar	12.3	Na	4.5	2.5	3	3.5	Na
Beef [c]	18.3	8.0	5.3	1.4	4	3	1
Dairy Products	39.7	7.6	4.5	2.3	12[d]	na	17[d]

a) T&A: Tyers and Anderson (1992). Based on a 50 percent phased reduction in agricultural protection in industrial countries as reported in Table 7.1 for year 2000. Alternative estimates for full liberalization are in their Table 6.3. WFM: World Food Model, FAO(1995). Entries are from Table 2, Sharma et al. (1996). Percentage changes are from a year 2000 base. ATPSM: Agricultural Trade Policy Simulation Model, UNCTAD (1995). Entries from Table 2, Sharma et al. (1996). Percentage changes are from a year 2000 base with assumed policy response in non-OECD counties. Impacts are large in the scenario with no policy response to world market prices in these countries. RUNS: Rural-Urban North-South model, Goldin and Van der Mensbrugge (1995). Percentage changes are from a year 2002 base, with adjustments in policies from the 1991-1993 average levels. The price changes using a 1982-1993 average policy base were all between +1.2 (wheat) and -1.5 (rice), but showed no clear direction of difference compared to those reported here. ABARE: Australian Bureau of Agricultural and Resource Economics, Vanzetti, et al. (1994). Based results reported in Table 13.2 for percentage changes from a 1989 base for the Uruguay Round Agricultural Agreement as represented in the Blair House Accord using the SWOPSIM Model (Roningen and Dixit, 1989). USDA: United States Department of Agriculture, USDA, Office of Economics (1994). Projections include both agricultural sector impacts and economic growth impacts from the overall Uruguay Round Agreement. Projected changes refer to percentage changes from baseline projections for the year 2000. They represent explicit or implied world price changes. FAPRI: Food and Agricultural Policy Research Institute, Helmar, Meyers and Hayes (1994). Based on projections of the Uruguay Round Agreement, including CAP reform as part of the overall package as reported in Table 12.8.

b) Based on the change in CIF Rotterdam prices, except rice which is FOB Bangkok.

c) Tyers and Anderson (1992) aggregate ruminant meal. For the RUNS model, this includes bovine and sheep meat. ABARE provides estimate for FMD-free and FMD-affected markets. This figure is a weighted average based on an estimated 60% of trade in the FMD-free market. For FAPRI, this is the Nebraska Direct Fed Steer price.

d) For ABARE, Dairy includes a single average of butter, milk powder (both 10 percent) and cheese (17 percent). For FAPRI, this is the average FOB Northern Europe price change where the cheese price rose by 40 percent, butter price rose by 10 percent and nonfat dry milk price fell by 1.5 percent.

Table 3.2.2 summarizes projections on income or net welfare effects of Uruguay Round trade liberalization. The projections from the two general equilibrium models, MRT and FMN, are taken from Table 4 in Sharma et al.(1996). These models provide results for agricultural liberalization alone and for the economy-wide liberalization accomplished in the Uruguay Round. Projection results from the agricultural sector models of Vanzetti et al. (1994) (ABARE) and Tyers and Anderson (1992) (T&A) are also presented. Gains in global income for economy-wide liberalization 39.6 billion US$ in the FMN model and 92.9 billion $US in the MRT model. Total gains from agricultural reform are about $5 billion in the FMN model and $58 billion in the MRT model. For both these models (FMN and MRT), the aggregate benefits of agricultural reform are far larger for the developed than for developing countries. The Tyers and Anderson (1992) results are provided for the developed (industrialized countries. Gains from agricultural liberalization projected by MRT and T&A are large, especially in the protectionist importers. The gains from agricultural liberalization are quite small for both the FMN and ABARE models.

The modeling completed after the URA is troublesome in that, even with the reform commitments spelled out in detail, modelers have not been able to incorporate the implied policy changes into their models in any real detail. For example, the use of a PSE to capture trade effects of policy change will always be suspect and even model builders know that this is at best a very rough approximation. Further, researchers seem to have found no standard way to report results of projection such that they may be meaningfully compared across models.

Table 3.2.2: Effects of Uruguay Round Trade Liberalization on Incomes (US & Billion)

	Model[a]					
	T&A	MRT		FMN		ABARE
	Agricultural Reform	Agricultural Reform	Economy-wide Reform	Agricultural Reform	Economy-wide Reform	Agricultural Reform
United States	0.4	1.7	12.8	0.1	10.1	0.2
EU-12	14.1	28.5	38.9	4.8	14.6	0.7
Japan	17.9	15.2	16.7	-0.5	1.3	1.1
Australia/ New Zealand/Canada	1.6	1.4	2.7	0.6	0.3	1.2[b]
Developed	35.6	49.1	75.2	4.3	26.9	na
Developing	na	9.2	17.7	-0.2	10.3	na
World	na	58.3	92.9	4.6	39.6	3.5

a) Tyers and Anderson (1992). Table entries based on a year 2000 net economic welfare effects of a phased 50% reduction in agricultural protection in industrial market economies. Changes reported in 1985 US dollars in Table 7.7. MRT: Multi-Regional Trade Model, Harrison et al. (1995). Reported in 1992 US dollars in Sharma et al. (1996) Table 4.
FMN: Prepared for the World Trade Organization, Franscois et al. (1995). Reported in 1992 US dollars in Sharma et al. (1996) Table 4. ABARE: Australian Bureau of Agricultural and Resource Economics, Vanzetti et al. (1994) Table 1.3.

b) Includes entire Cairns group except Fiji.

Given the range of projected effects and the general inability of these models to specify fully the policy reforms imposed by the Uruguay Round, it seems reasonable to treat these efforts as contributions to model building rather than contributions to reliable knowledge about the Uruguay Round. Nonetheless, more recent research has begun to build upon both the models and the results just reviewed. This second generation of analysis of the impacts of the URA is represented by recent work by Anderson (1997). Anderson uses a small CGE model to examine the welfare impacts of the URA on several developing countries basing his analysis on output from the larger CGE results from the RUNS model by Golden and van der Mensbrugghe (1995). Anderson notes that the international price increases implied by the URA have two broad impacts on national welfare. The first, labeled the terms of trade effect, indicates the gains or losses experienced from changing import and export prices. The magnitude of the terms of trade effect is approximated by the quantity of net trade times the size of the price change. The second effect, labeled the "distortion effect," measures the degree by which changes in international prices offset or reinforce distortions created by domestic agricultural policies. K. Anderson and Tyers (1993) provide similar quantitative analysis using their sector specific multi-commodity model.

Most developing countries are net importers of agricultural products, but these same countries have often biased internal prices against agriculture. Thus, if they are allowed to penetrate to the domestic markets, the higher world prices caused by the URA may partially offset the low prices experienced by developing country farmers and consumers. Anderson estimates that the distortion effects dominate the terms of trade effects for most of the 15 commodities and 9 countries he examines. As Anderson notes, his results depend crucially on the (for him) exogenous estimates of the world price impacts and internal price policies. For a measure of price distortion, Anderson uses USDA calculations of the PSE and CSE by commodity for each country. Of course the PSE and CSE estimates provide only a very rough guide to price distortions. This problem is compounded in this application because missing observations are assigned zero values and because the PSE and CSE data are seriously out of date for a forward-looking analysis of the impact of price increases likely to occur mainly in the period after 1999.

In summary, the ex post quantitative analysis of the Uruguay Round seems sadly limited in providing a solid basis for understanding the likely impacts of the agreement. The models we use are on the one hand complex enough to defy comprehension of what drives the results and

on the other hand so simple that they cannot incorporate crucial features of a complex policy reform.

Further, these quantitative models are built on a parameter base that seems mostly lacking, or inappropriate to the specific questions being posed. Sumner (1993), Just et al. (1995), and McDonald and Sumner (1998) discuss such parameter problems in more detail in the context of agricultural supply functions. They suggest much more attention to defining and devising estimates that are tailored to each application. Standard econometric estimates from historical data are simply not appropriate for most policy analysis questions because they are based on a set of ceteris paribus conditions that no longer apply. Researchers must devote much more attention to the empirical basis of simulation models before projections can be treated as reliable evaluations of trade agreements or other policy shifts (Carter and Gardiner,1988).

4 Issues for Future Research and Policy Reform

In spite of the progress made in the Uruguay Round, international agricultural trade is still far from being truly liberalized. Indeed, some of the new rules and commitments agreed in the Uruguay Round have opened up new questions, as discussed in the preceding sections. Moreover, economic research and the political debate have indicated a number of new issues that need to be dealt with in the future. Another multilateral round of negotiations on agricultural trade will have to be initiated in 1999, as stipulated in the Uruguay Round Agreement on Agriculture. In this next round of agricultural negotiations, the unfinished business of the Uruguay Round, as well as some of the new issues will have to be tackled. Josling (1996a, 1997), Tangermann (1997) and Tangermann et al. (1997) have discussed issues for the next round in detail. Some of the more pressing itemsinclude future treatment of state trading (Section 4.1), further development of rules on sanitary and phytosanitary measures (Section 4.2), reduction of tariff dispersion (Section 4.3), and improvements in the administration of tariff rate quotas (Section 4.4).

4.1 State Trading

State trading was not much dealt with during the Uruguay Round, except for the negotiations which finally led to the Understanding on the Interpretation of Article XVII of the GATT 1994. However, this Understanding does not change or strengthen GATT rules for state

trading.[13] Hence, a number of important issues still remain to be settled. As rules for agricultural trade are tightened in the WTO, state trading becomes an increasing anomaly, and the next round of negotiations should deal in more detail with the issues arising out of this anomaly. In agriculture, state trading enterprises (STE) still play a large role[14], and there are a number of issues where state trading in agriculture is different from state trading in other areas. Moreover, the importance of tightening rules on state trading in agriculture has grown as countries such as China and Russia are about to join the WTO.

One fundamental requirement of better rules on state trading is a proper definition of what constitutes STE. The Uruguay Round Understanding came up with an institutionalist definition, which though leaves a number of key questions unresolved (Dixit and Josling, 1997). More important, however, are decisions on what STE can and what they must not do. Josling (1996b), Dixit (1996), and Dixit and Josling (1997) have discussed approaches that could be used.

On the import side, the major issues involved in state trading are that import volumes are likely to be lower than those that would be achieved under competition and an equivalent tariff barrier. Also, STE are more likely to discriminate between different national sources of imports. In theory, no such problems should arise after the Uruguay Round. After all, tariffication has included those cases where state enterprises conduct imports (with the exception of the "rice clause"). Hence, tariffs are now bound, and where state enterprises sell imports domestically at a price higher than the world market price plus tariff, such mark-ups have also been bound. Article II:4 of the GATT 1994 requires state trading enterprises not to provide more protection than bound in the Schedule of the country concerned. Therefore, importing STE should now be operating under tightly defined rules. In theory this should result in a situation where the domestic price of the product concerned is no higher than the lowest available international price plus tariff and mark-up. If this were the case, then discrimination between sources would also not occur, as the supplier offering the lowest price would determine the domestic price in the importing country.

In practice, however, the operations of STE often lack transparency, and it is therefore not clear whether they actually honor these fundamental rules. This would, however, not need to be

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[13] However, as stipulated by the Understanding, a WTO Working Party on State Trading was established, and WTO Members are required to notify their state trading enterprises to it.

[14] On international wheat markets, for example, 40 percent of total wheat trade in 1996 was imported by countries identified as relying on STE (Abbot and Young, 1997). In 1995 and 1996, 30 countries notified the WTO of more than 100 STE involved in agricultural trade (Dixit and Josling, 1997).

the case, if the outcome of the operations of state trading enterprises were monitored more closely, with regard to two basic criteria. First, domestic prices in the importing country should, indeed, not be higher than international prices plus bound tariffs and mark-ups. Second, the quantities imported should be fully sufficient to satisfy domestic demand at those prices. Neither of these concepts is new. Hence, it may be sufficient to reconfirm their applicability, and to agree on practical modalities for monitoring consistency of state trading operations with these rules.

Among the issues relating to exporting state trading enterprises, discrimination among destinations ("pricing-to-market"), and price pooling between domestic and export sales are probably the most controversial potential problems. Pricing-to-market is a very difficult issue to deal with. To an extent it is a normal commercial practice, related to transport costs, quality differences and other similar factors. However, pricing-to-market can also be used as predatory pricing. Even then it can be a "normal" commercial practice, also used by private trading companies. Price discrimination among different destinations is not prohibited by the Agreement on Agriculture, or by the GATT 1994, as long as no subsidies are involved. STE, though, have to honor Article XVII:1(a) of the GATT 1994 which requires them to "act in a manner consistent with the general principles of non-discriminatory treatment prescribed ... for governmental measures affecting imports or exports by private traders". Whether this provision also prohibits price discriminating state agency exports where no subsidies are involved (and hence no "governmental measure affecting exports" is used) is a question to be answered by lawyers.

In general one should not forget that it is difficult in practice to determine price discriminating export subsidies. The Tokyo Round Subsidies Code (now defunct) had provisions against agricultural export subsidies displacing other countries' exports or resulting in "prices materially below those of other suppliers". However, panels had major difficulties to find such practices, and in no single case has it been ruled that a country violated these provisions. It should also be noted that price discrimination on export markets is not limited to cases where state agencies operate. It can also occur where governments grant export subsidies to private traders and do so in a differential manner, depending on the destination. Of course, remaining export subsidies must be notified and are being reduced.

Price pooling between domestic and export markets, as often done by exporting STE (or resulting from domestic state agencies with similar powers) should be easier to deal with. After all, the issue in this case is essentially one of export subsidies, and therefore falls under the export subsidy provisions of the Agreement on Agriculture. Where a state agency sells

domestically at a price above the price charged for exports, while domestic producers are paid the average price, exports are implicitly subsidized. In this case, both domestic consumers and domestic produces have prices above the export price. In some cases the subsidy element is even more than would be achieved through direct export subsidy programs (Alston and Gray, 1998). Countries should, therefore, not be allowed to escape their export subsidy commitments by using price pooling. It should be clear that an effective constraint on the extent of price pooling is established through the commitments on export subsidies. It may be useful to confirm the applicability of the export subsidy provisions to these cases explicitly in the next round of negotiations.

Indeed, price pooling is much broader than state trading and appears often in the context of internal price regulation schemes. For example, cooperatives (which may have some government backing or tax advantages) apply price pooling across markets without any direct government regulations. Many countries regulate dairy prices to facilitate price discrimination across end-uses of milk and use price pooling to distribute the returns of the rents from price discrimination. Where they contribute to export price discrimination, such schemes are a substitute for export subsidies and are quite similar in trade effect to price discrimination with price pooling as practiced by some STE exporters (Sumner 1996).

4.2 Analysis of Sanitary and Phytosanitary Trade Barriers

The Uruguay Round Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) was negotiated to clarify the rights of governments to take protective actions, and the conditions that must be met to ensure that these actions are not unjustified barriers to trade. The key provision in this agreement is that all measures must be scientifically based. To meet this condition, countries have two options. They can either use international standards, or set their own standard if there is scientific justification based upon an assessment of risk (Stanton, 1997). In either case, the commitment to a given level of protection must be reflected domestically. Equivalent regulations are to be applied to both domestically produced products and imports. Also, the measures are not to be more restrictive to trade than necessary to provide the desired level of protection.

Analysis of the impacts of SPS trade barriers remains a difficult subject, both theoretically and empirically. Analysis requires the tools of traditional trade policy analysis, and risk assessment. If the effects of agricultural imports on human, animal and plant health were known

with certainty, policy analysis of SPS measures could be performed using standard trade models. The sheer number and variety of regulations adds to the complexity of the analysis. However, the problems in this case are ones with which economists are relatively comfortable. (Sumner and Lee, 1997, discuss how SPS regulations may be incorporated into a multi-commodity model.) SPS effects are not known with certainty, and this raises the complexity of the analysis. The empirical challenge is to quantify the tradeoffs between the risks and benefits of allowing agricultural imports. Higher degrees of protection are typically associated with lower import levels. This means that any gain in health related benefits from a SPS policy must be balanced against the costs imposed on consumers of the imported commodity.

The first step in an analysis of this type is determining the range, and probabilities over this range, of possible health related consequences associated with trade in the commodity. Protection offered by a SPS measure is then characterized by the conditional probabilities over the range of consequences given that measure is in place. Tradeoffs between a higher degree of health certainty and the costs associated with trade restricting regulations can then be quantified by simulating how the distributions of consequences, both health related and economic, change in response to proposed regulatory actions. Performing such an analysis requires a large amount of detailed and site specific information on the physical and the economic characteristics of the region of interest. However, analysis of this type has been used in other contexts to examine trade, health, and environmental linkages (see, for example, Antle et al., 1996), and is feasible if sufficient time and resources are available.

Powell (1997) and Hillman (1997) review the role of science in SPS trade disputes. They note that the scientific risk assessment needed for effective dispute resolution is not generally available and may not be unbiased. Powell examines two “headline cases” where scientific evidence has been strongly supportive of relaxing trade barriers. Based on scientific evidence that US industry supporters continue to question, the U.S. government agreed to allow Mexican fresh avocados a small and geographically limited market in the United States. The WTO panel and appeal process has now ruled that the EU ban on beef from cattle fed growth hormones is not supported by science, but the ban continues pending additional risk analysis in the EU. Powell goes on to provide lessons about how future disputes in this area are likely to proceed and how scientific evidence is likely to be used.

Roberts (1997) also reviews the progress of a number of SPS disputes that have appeared before the WTO. She concludes that disputes are likely to continue in this area as new products, such as genetically modified organisms, are released onto international markets. The cases to date have yet to settle issues of law or evidence that would allow traders to predict well the

outcome of disputes and respond with preventative policy change. Thus we may expect to see disputes in this area until issues are clarified. We also do not yet know if large and powerful traders, such as the EU, will actually allow internal SPS rules to be dictated from Geneva.

A standard concern is that the use of SPS regulations would increase as other means of restricting trade were reduced under the Uruguay Round. One reason for this concern is the difficulty in distinguishing disguised trade barriers from trade restrictions due to legitimate health concerns. Because the comparison is between a distribution of consequences with and without the regulation, it is not possible to draw conclusive results from past experiences, as any such experience is only one realization from the distribution of possible outcomes. Also, the causes and mechanisms of the health risks associated with trade in agricultural commodities are often poorly understood and hard to quantify. This makes it difficult to come up with a scientific consensus on the nature and probabilities of the risks involved. There are a number of public choice studies in this area trying to understand the complex web of economic and political factors that determine a final regulatory decision (see, for example, Roberts and Orden, 1997). However, there is still much to be learned about the conditions under which international trade agreements can discipline the use of SPS measures as disguised trade barriers.

4.3 Tariff Dispersion

In the Uruguay Round it was agreed that agricultural tariffs had to reduced by a simple unweighted average rate of 36 per cent (in developed countries), with a minimum rate of reduction of 15 per cent for each tariff line. This provision opened up the possibility of spreading the reduction requirement rather unevenly across products. For example, it was possible for a country to reduce tariffs on three items with an initial tariff of more than a hundred per cent by only 15 per cent each, and still meet the overall 36 per cent unweighted average reduction by eliminating (i.e. reducing by 100 per cent) the four per cent initial tariff of one other product. As a result, countries were enabled to continue providing particularly high protection to their "sensitive" products. Countries have used this flexibility differently, but in many cases with a tendency to reduce high tariffs less than low ones. The result is that after the implementation period of the Uruguay Round many tariff peaks will remain, and tariff dispersion will in many cases be even more pronounced than it was at the beginning of the implementation period. For example, as shown in Table 4.3.1, in major industrialized countries (EU, Japan, United States) the unweighted average of tariff rates will, at the end of the Uruguay Round implementation period, be reduced by less than 36 per cent compared to the base level (row 4),

and dispersion of final tariff rates, indicated by the coefficient of variation, will be higher than dispersion of the base rates (compare rows 5 and 6).

Table 4.3.1: Average Tariff Reductions Agreed in the Uruguay Round

	EU	Japan	USA
(1) Base period average tariff level (%)	26.2	52.3	11.3
(2) Final period average tariff level (%)	17.7	40.2	7.9
(3) Average of reduction rates (%)	37.7	36.8	38.8
(4) Difference (1a) - (1b) (in % of (1a))	32.4	23.2	30.0
(5) Coefficient of variation of base tariffs (%)	163.7	399.8	213.6
(6) Coefficient of variation of final tariffs (%)	169.6	426.4	259.0

All averages are unweighted
Source: Tangermann (1995)

The detrimental implications of the approach to tariff cutting adopted in the Uruguay Round may be significant. Economic theory and quantitative analysis suggest that uneven rates of protection among products closely related in production or use can distort the use of resources in world agriculture even more than a slightly higher but more uniform level of protection (Corden, 1971; and Koester et al., 1988).

An issue related to tariff dispersion, though of a more specific nature, is tariff escalation along given processing chains. Depending on the share of value added through processing in a given product, even slight increases in tariff rates along the processing chain can afford very significant protection to the processing activity involved.[15] Exporting countries then find it difficult to access the market for the processed product concerned, and may have to export the unprocessed raw material, even though their domestic processing industries could be competitive. This is a particular problem for developing countries in their efforts to diversify their traditional commodity exports into higher value-added products. Recent empirical results show that tariff escalation has at least not become more pronounced as a result of the Uruguay Round reductions in agricultural tariffs (Lindland, 1996).

[15] Even constant rates of tariffs along a processing chain provide protection to processing, at the rate of those tariffs. Thus, in order to avoid effective protection of processing activities, tariffs would actually need to de-escalate along processing chains. See Tangermann (1989).

It seems clear, though it has not been studied in great detail, that a serious effort to reduce tariff dispersion and tariff escalation would provide substantial welfare gains. This is an area in which additional empirical analysis would be helpful. A flat-rate uniform reduction of all tariffs would yield some gains. Of course, an agreement to reduce higher tariffs by more than lower tariffs would reduce dispersion even more. This is exactly what was achieved for industrial tariffs during the Tokyo Round, through use of the so-called Swiss formula for tariff reductions.[16] However, there is good reason to believe that higher tariffs are more likely to be prohibitive and perhaps higher than required to continue to limit imports severely. This means that dropping these tariffs most would expand trade less in the short run, but allow more to be achieved later. An interesting variation on this theme may be an approach by which countries are allowed to choose among (a) a flat-rate reduction of all tariffs, and (b) a formula cut which yields an agreed somewhat smaller average reduction of tariffs but attenuates tariff dispersion.

4.4 Tariff Rate Quotas

The host of new tariff rate quotas (TRQ) in agriculture which have resulted from the Uruguay Round arrangements for agriculture, mainly under the minimum access and current access provisions, constitute one of the most strongly criticized elements of the current WTO regime for agriculture (Hathaway and Ingco, 1995). Under TRQ, there is a strong flavor of managed trade. TRQ are considered to be a tool of tariffication because they may be viewed as simply two (or more) tariffs applied to the same product and conditional on the quantity of prior imports. Where above-quota tariffs are prohibitive (which often was the case after the Uruguay Round), TRQ function similarly to quantitative trade barriers. Governments get heavily involved in trade as they are allocating licenses under TRQ. Major monetary gains may be derived from such licenses. Where the difference between the domestic price and the world price exceeds the within-quota tariff, a quota rent accrues to the holder of the license. In these cases, interest in obtaining licenses is high among the agents concerned, and some form of allocation mechanism has to be established. The mechanism used has direct implications for the income distribution resulting from quota rents, but it may also affect trade flows. For example, in some cases administration of TRQ is left to parties directly interested in the outcome, with the

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[16] The Swiss formula is $y = 100 - (100a)/(a+x)$, where y is the percentage tariff reduction, x is the original *ad valorem* (equivalent of the) tariff rate, and a is an agreed number determining the average size of tariff reductions. In the Tokyo Round, a was set at 14. See Senti (1986, p. 85). For results which would have been obtained had that formula been used for agricultural tariff cuts in the Uruguay Round, see Tangermann (1995).

expected questionable results for quota fill.[17] Many TRQ are, openly or silently, administered on a bilateral basis, thereby undermining the MFN principle. On the other hand, in many cases TRQ commitments were the only tangible improvement of market access achieved in the Uruguay Round. For the next round of negotiations, the objective should be to preserve the trade expansion features of this instrument, and to minimize its trade distorting effects.

The trade expanding features of the TRQ which have resulted from minimum access provisions can be preserved if the respective quantities are further increased. At the same time, it could be agreed that the lower within-quota tariffs must not exceed a given percentage of the base tariffs. In the Uruguay Round it was essentially left to countries to decide by how much they wanted to reduce their "normal" tariffs within minimum-access TRQ. As a result, the ratio between within-quota and above-quota tariffs now differs very much from case to case (for some evidence, see Tangermann, 1996). In the longer run, the issue of TRQ could gradually fade away as "normal" (i.e. above-quota) tariffs are reduced more and more and the gap between within-quota and above-quota tariffs is reduced and finally eliminated.

Minimization of the trade distorting implications of TRQ requires that transparent and impartial methods are used to allocate import licenses. Indeed, there is one clear and simple, neutral approach—the auctioning of licenses. The advantages of auctioning import quotas, have been discussed in detail by Bergsten, Elliott, Schott and Takacs (1987), who also suggest approaches to overcoming potential drawbacks of this approach. Some countries (for example Iceland, Korea and Norway) have already begun to auction some of their agricultural TRQ after the Uruguay Round. However, exporting countries have raised doubts as to whether the resulting auctioning fees do not constitute (GATT illegal) extra duties, over and above the bound tariffs. Economic reasoning clearly suggests that auctioning fees do not add to the costs of imports. In an auction, an importer would not offer (and pay) fees that are higher than the rent he can expect to gain from the import activity concerned. For the exporter it is, therefore, irrelevant whether a rent flows to the importing company or an equivalent fee is paid to the government of the importing country. As a corollary, fees paid in an auction do not reduce the volume of trade and do not impair incentives to use quotas fully.

As a matter of fact, under an auctioning system there is competition among trading companies, and the most efficient company will get access to the licenses. That company, being

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[17] For example, licenses for butter imports may be given to processors (rather than retailers); licenses for broiler chicks may be given to domestic hatcheries, in proportion to the number of chicks hatched in the preceding year

efficient, is also likely to pay the exporter the highest possible price. This price may, therefore, well turn out to be higher than the price paid by an inefficient trading company which received a license just because it used to be in the business in the past, or because it was the first to apply for licenses, or because it had particularly good relations with the agency responsible for allocating licenses. Moreover, as an auctioning system fosters competition, the most competitive exporting country is bound to get the best access to the market of the importing country concerned. This is exactly what the MFN principle requires. Hence, the requirement to implement quantitative government measures such that the MFN principle is honored, as laid down in GATT Art. XIII, is best (if not only) met if licenses are auctioned. Competition as fostered through auctions also means that trading companies cannot simply rely on past performance. Sometimes it is argued that this can disrupt established trading relations among companies and countries (Bergsten, Elliott, Schott and Takacs, 1987), and some exporting countries have taken this as an argument against auctioning (and in favor of quota allocation on the basis of past performance). However, an auctioning system need not disrupt established trade relations because provisions can be introduced which allow for "correcting" the immediate outcome of an auction. In particular, licenses can be made tradable after auctions. Moreover, exporters' rights could be improved by giving them full access to auctions.

Another objection occasionally raised against auctioning is that individual importing companies can try to buy up all licenses and then monopolize the import market. Monopoly rents may be earned by "short shipping" the product concerned by not actually using the whole amount of licenses. (This also allows the monopolist to outbid other participants in the auction.) If this were to occur, it would disadvantage not only domestic consumers in the importing country, but also the other exporters concerned. However, antitrust provisions could be used to mitigate this threat, and specific regulations (such as "use-it-or-lose-it" requirements) can also be introduced (see Bergsten, Elliott, Schott and Takacs, 1987, pp. 53-4).

It would, therefore, be advisable to agree generally in the WTO that auctioning is an appropriate (if not the only appropriate) approach to the administration of TRQ. Possible legal concerns regarding the consistency of license auctioning with various GATT provisions (see Bergsten, Elliott, Schott and Takacs, 1987, pp. 125-33) should be openly discussed, and if necessary the legal framework should be adjusted such that auctions can replace the many questionable approaches which so far are being used to allocate TRQ licenses.

5 Conclusions

This chapter has looked at the history, results and analysis of international negotiations on agricultural trade, with an emphasis on the GATT and in particular on the Uruguay Round. For a long time, international negotiations as pursued in the framework of the GATT have done little to discipline national agricultural policies and liberalize agricultural trade. National interests were stronger than the international rules. Moreover, because of the predominance of protectionist tendencies in so many countries, the international rules for agricultural trade as embedded in the GATT were formulated such that they remained largely ineffective. The Uruguay Round can be described as the first serious attempt to overcome this situation. New and more stringent disciplines have been established for market access, export competition and domestic support in agriculture. This chapter has looked into the issues dealt with in each of these three areas covered in the Uruguay Round negotiations, and highlighted their specific characteristics. It concludes that progress has been made, but also that the effects on national policies and the liberalization of agricultural trade achieved remain limited for the time being. Much unfinished business remains in the area of international negotiations on agricultural trade.

Agricultural economics has made important contributions to the analysis of the issues that have plagued agricultural trade for a long time. This chapter has highlighted these contributions. Academic analysis has helped negotiators to understand better the implications of policies and the potential effects of alternative negotiating approaches. Much progress has been made in this regard, too. Some of the solutions adopted in the Uruguay Round directly reflect the results of research done by agricultural economists over the years. However, this chapter also concludes that much unfinished business remains in the analysis of international trade issues in agriculture. For example, further progress is needed in the design of distortion measures and in the quantitative analysis of the trade impacts of policy changes as agreed at the international level.

The next round of WTO talks provides an opportunity to settle some of the unfinished business and to make further progress towards international agricultural policy reform. However, it will probably require a number of further negotiating rounds before agricultural trade is truly liberalized. In agricultural economics, major efforts are required to keep up with the growing demand for sound analytical results that can foster and underpin these negotiations.

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