Determining Winners and Losers
from a GATT Agreement:
The Importance of Base Periods and Rules

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ABSTRACT

To identify the winners and losers from a General Agreement on Tariffs and Trade (GATT) agreement on agriculture, it is necessary to know which countries will be required to reduce which subsidies by what amounts. Rules that seem fair may actually impose very different future obligations on the parties to the negotiations. The base period from which reductions must be made, the manner in which export subsidies are measured, and the exchange rate used to determine tariff-reduction requirements are examples of technical issues that determine the policy implications of a GATT agreement. The paper estimates credits that countries have earned for policy changes already enacted and for changes in world market conditions under various sets of rules. These credits vary greatly across countries and commodities and are extremely dependent on the specific rules assumed. Thus, an agreement requiring a 30 percent subsidy reduction from a particular base period may result in no required policy changes for some commodities in some countries and very large subsidy reductions for other commodities in other countries.

DETERMINING WINNERS AND LOSERS FROM A GATT AGREEMENT: THE IMPORTANCE OF BASE PERIODS AND RULES

Introduction

As this paper is written, the final form of a General Agreement on Tariffs and Trade (GATT) agreement on agriculture, if there is to be one, remains unclear. Because the major parties have had difficulty arriving at even a framework for agreement, relatively little attention has been given to the specific rules that will determine which countries must reduce which subsidies by what amount. A myriad of issues must be resolved before rules can be written that will clearly obligate countries to make specific policy changes.

The purpose of this paper is to demonstrate that the fine print of a final GATT agreement will play a crucial role in determining who gains and who loses. Three of the many issues before the negotiators are examined in this paper:

1. What is the base period from which cuts must be made?

2. How should export subsidies be measured?

3. What exchange rate should be used to determine tariff-reduction requirements?

There are many plausible ways to resolve each of these issues. Instead of relying on econometric models to estimate what would happen under one particular set of rules (as was done in the Center for Agricultural and Rural Development's GATT Research Paper 91-GATT1), this study calculates, under a variety of alternative rules, the "credits" that countries have earned for policy changes they already have implemented. The important conclusion of this study is that rules that seem to treat all countries and commodities equally may in reality impose very different future

obligations across countries and commodities. A rule that requires all countries to reduce internal supports by 30 percent from a 1986-88 base period, for example, may mean no future reductions in U.S. target prices, but large reductions in EC intervention prices.

The calculations presented here are incomplete and contingent on a set of simplifying assumptions that may not hold in practice, even if the rules are set exactly as assumed. Furthermore, the chance that all the many rules will be set precisely as assumed under any of the stylized scenarios presented here is remote. Thus, it is important that the specific numerical results be seen as illustrative, rather than definitive. The purpose of the study is not to identify the best or worst possible set of rules, but to encourage negotiators to examine the consequences of alternative rules more carefully.

The first section of this paper examines the effects of alternative base periods on Aggregate Measure of Support (AMS) calculations for different commodities and countries. The second section looks at alternative measures of export subsidies, and the third section considers the importance of the exchange rate in determining tariff reduction obligations.

Base Periods and AMS Calculations

One of the few areas of general (but not universal) agreement in the early rounds of the GATT negotiations was that an AMS would be used to determine obligations to reduce internal supports. There was less agreement, however, concerning how the AMS should be measured. Important issues include the following:

1. Which policies should be included in and excluded from the calculations? In common parlance, which policies are "green" (not subject to reduction), and which are "amber" (subject to reduction)?

2. Should market price support provided by border measures be included in the
   AMS calculations, or should such support be disciplined under the market access
   provisions?

3. How should reference prices be defined? Should the reference price be fixed, or
   should it change with world market prices?

4. What should be the base period from which AMS reductions must be made?

To focus on the base period issue, particular solutions are assumed for the other three sets of
issues. Included in the AMS calculations are direct government payments to farmers (e.g., U.S.
deficiency and diversion payments) and market price support provided by specific policy prices (e.g.,
EC intervention prices), even when border measures or export subsidies are used to implement the
price support. However, market price support greater than official policy prices is excluded from the
calculations. The reference price is the average world market price for the commodity during the
base period, expressed in terms of local currency and adjusted for transportation and marketing costs.
These assumed rules are plausible outcomes of the negotiations, but any or all of the issues may be
resolved differently.

In the early stages of the negotiations, 1986-88 was the most commonly discussed base period
for AMS calculations. Given a 1986-88 base period, Table 1 reports the calculated annual AMS
during the base period and during 1990 for important commodities in the United States, the European
Community, Japan, and Canada. The estimates are incomplete in that they exclude certain policies
and commodities, but they illustrate several points:

- The importance of particular commodities in determining the total AMS varies greatly across
  countries. Rice, for example, accounts for more than 70 percent of the AMS for Japan, but it
  is a relatively small component of the AMS for the United States, the European Community,
  and Canada.

Table 1. Aggregate Measure of Support (AMS) under a 1986-88 base period

	United States		European Community		Japan		Canada	
	Base Period	1990	Base Period	1990	Base Period	1990	Base Period	1990
	(Million Dollars)		(Million ECUs)		(Billion Yen)		(Million Canadian Dollars)	
Feed Grains	7,696	5,156	4,888	3,803	51	44	368	141
Corn	6,713	4,545	1,973	1,439	0	0	0	0
Barley	214	94	2,915	2,364	51	44	368	141
Sorghum	764	517	0	0	0	0	0	0
Oats	5	0	0	0	0	0	0	0
Food Grains	3,789	3,286	4,708	4,453	2,647	2,448	1,240	682
Wheat	3,047	2,560	4,621	4,344	144	143	1,240	682
Rice	742	726	87	109	2,503	2,305	0	0
Oilseeds	0	0	1,409	1,087	66	63	237	113
Soybeans	0	0	346	209	66	63	0	0
Rapeseed	0	0	1,063	878	0	0	237	113
Sugar	1,394	1,232	4,289	4,370	67	64	0	0
Cotton	1,355	1,003	0	0	0	0	0	0
Crop Subtotal	14,234	10,677	15,294	13,713	2,830	2,619	1,845	935
Dairy Products	4,859	4,334	15,484	14,667	532	558	1,687	1,825
Butter	1,007	690	4,162	3,256	NA	NA	373	376
Cheese	3,353	3,192	9,975	10,266	NA	NA	1,138	1,284
Nonfat Dry Milk	317	285	1,347	1,145	NA	NA	176	165
Net Payments	182	167	0	0	NA	NA	0	0
Livestock	0	0	21,173	19,362	0	0	0	0
Beef	0	0	12,108	11,573	0	0	0	0
Pork	0	0	9,065	7,789	0	0	0	0
Total	19,093	15,011	51,951	47,742	3,362	3,176	3,533	2,760

Note: AMS is calculated by using a constant reference price equal to the average of 1986-88 world market prices. The calculations incorporate the most important policies providing support to the agricultural sector in each country, but exclude a variety of policies and commodities. For the United States, the calculated AMS includes deficiency, diversion, and Farmer-Owned Reserve payments and market price support offered by Commodity Credit Corporation purchase prices for dairy products and the loan rate for sugar. For the European Community, the calculated AMS includes market price support offered by intervention or threshold prices, adjusted (where appropriate) for stabilizer programs. For Japan, the calculated AMS includes market price support offered by government purchase prices (dairy product support is measured on a milk-equivalent basis, so no breakdown by product is available). For Canada, the calculated AMS includes the Western Grains Transportation Act, the Western Grains Stabilization Act, the Agricultural Stabilization Act, the Special Canadian Grains Programs, and market price support offered by dairy support prices.

- For most countries and commodities, the calculated AMS for 1990 is less than the average AMS during the 1986-88 base period, which implies that there have been reductions in direct payments, support prices, and/or quantities subsidized. Because fixed reference prices are used, changes in AMS cannot be ascribed to changes in world market prices or exchange rates.

- The calculated changes in AMS between 1986-88 and 1990 are not uniform. For the same commodity (e.g., dairy products), levels of support have fallen in some countries and increased in others. Within the same country, the AMS has been sharply reduced for some commodities, whereas it has actually been increased for others.

The variability in AMS changes across countries and commodities makes it difficult to generalize about what a certain percentage reduction in AMS from a 1986-88 base would mean in terms of future support reductions. One way to summarize the information in Table 1 is to calculate the credits each country has earned for reducing its AMS for each commodity. This method provides estimates that are useful in examining the implications of various levels of required AMS reductions. A second way is to calculate the AMS reductions from 1990 levels that are required to achieve a certain percentage reduction from the base period. This second method has more intuitive appeal than the first, but it necessitates an assumption about the AMS reduction requirement.

Table 2 reports AMS credits for 1990, as well as the future reductions necessary to satisfy the terms of an agreement requiring a 30 percent reduction in AMS from a 1986-88 base period. The principal conclusion from Table 2 is that there is great variation in the reported credits, implying significant differences in the required future reductions to meet the terms of a plausible GATT agreement. Other important results include the following:

- Primarily because of policy changes mandated by the Food Security Act of 1985 (FSA-85), the United States earns significant credits for most commodities. The total AMS was reduced by

Table 2. 1990 AMS credits under a 1986-88 base period and required AMS reductions from 1990 levels to achieve a 30 percent AMS reduction from a 1986-88 base

	1990 AMS Credit				Required Reductions from 1990 Levels			
	United States	European Community	Japan	Canada	United States	European Community	Japan	Canada
	(Percent)				(Percent)			
Feed Grains	33.0	22.2	12.9	61.8	0.0	10.0	19.6	0.0
Corn	32.3	27.1	NA	NA	0.0	4.0	NA	NA
Barley	56.1	18.9	12.9	61.8	0.0	13.7	19.6	0.0
Sorghum	32.3	NA	NA	NA	0.0	NA	NA	NA
Oats	100.0	NA	NA	NA	0.0	NA	NA	NA
Food Grains	13.3	5.4	7.5	45.0	19.3	26.0	24.3	0.0
Wheat	16.0	6.0	0.8	45.0	16.7	25.5	29.4	0.0
Rice	2.2	-25.3	7.9	NA	28.5	44.1	24.0	NA
Oilseeds	NA	22.9	4.8	52.6	NA	9.3	26.4	0.0
Soybeans	NA	39.6	4.8	NA	NA	0.0	26.4	NA
Rapeseed	NA	17.4	NA	52.6	NA	15.3	NA	0.0
Sugar	11.6	-1.9	4.4	NA	20.8	31.3	26.8	NA
Cotton	26.0	NA	NA	NA	5.4	NA	NA	NA
Crop Subtotal	25.0	10.3	7.5	49.3	6.7	21.9	24.3	0.0
Dairy Products	10.8	5.3	-4.8	-8.1	21.5	26.1	33.2	35.3
Butter	31.5	21.8	NA	-0.7	0.0	10.5	NA	30.5
Cheese	4.8	-2.9	NA	-12.9	26.5	32.0	NA	38.0
Nonfat Dry Milk	10.1	15.0	NA	6.7	22.1	17.7	NA	25.0
Net Payments	8.2	NA	NA	NA	23.7	NA	NA	NA
Livestock	NA	8.6	NA	NA	NA	23.5	NA	NA
Beef	NA	4.4	NA	NA	NA	26.8	NA	NA
Pork	NA	14.1	NA	NA	NA	18.5	NA	NA
Total	21.4	8.1	5.5	21.9	11.0	23.8	25.9	10.4

Note: AMS is calculated as described in the note to Table 1. Credits are defined as the percentage reduction in the AMS between the 1986-88 base period and 1990. Required reductions are the percentage AMS reductions from 1990 levels required to achieve a 30 percent reduction in AMS from the 1986-88 base period levels. Credits and required reductions do not sum to 30 percent because credits are measured relative to the base period, whereas future reductions are measured relative to 1990 levels.

21.4 percent between 1986-88 and 1990, implying that only an 11.0 percent reduction in AMS after 1990 would be required to satisfy a 30 percent reduction agreement. Policy changes resulting from the Food, Agriculture, Conservation, and Trade Act of 1990 (FACTA-90) and the Omnibus Budget Reconciliation Act of 1990 (OBRA-90) are not reflected in the 1990 estimates, but would result in even larger credits for most commodities.

- For feed grains, the reduction in target prices, the elimination of paid land diversion programs, and the reduction in Farmer-Owned Reserve payments were sufficient to bring the United States into compliance with a 30 percent reduction agreement. The reduction in target prices was almost sufficient to bring cotton into compliance. On the other hand, credits for wheat and rice were much smaller because lower target prices were offset by reduced acreage reduction requirements that increased the quantity of production receiving support. Dairy credits are primarily a result of reductions in support prices for butter and other dairy products. Sugar receives a modest credit only because poor growing conditions limited 1990 production and thus the quantity receiving support.

- Reduced intervention prices and the effects of stabilizer programs result in significant credits for most commodities in the **European Community**. Credits for corn and barley are larger than those for wheat, in part because the 1990 wheat crop was exceptionally large. Oilseed credits reflect severe penalties for overproduction under the oilseed stabilizer programs. Dairy credits can be attributed to a reduction in milk delivery quotas that, in turn, reduced production levels for butter and nonfat dry milk. Pork support prices were reduced in 1990, and beef production was lower than the 1986-88 level. The total AMS for the European Community was reduced by 8.1 percent between 1986-88 and 1990.

- In **Japan**, the total AMS is reduced by 5.5 percent, primarily because of reductions in the government purchase price for rice. Milk prices also fell, but production increased substantially, resulting in an increase in the AMS for dairy products.

- **Canada** earns very large credits in the crop sector because the Special Canadian Grains Programs were phased out and payments under other programs were abnormally low in 1990. Recent policy changes in Canada are likely to result in an increase in the AMS for 1991 and later years. A negative credit for the dairy sector results from rising support prices for butter and nonfat dry milk and an increase in cheese market prices (Canadian cheese prices are supported by import restraints and marketing quotas, not support prices, and so it is arguable whether an AMS should have been calculated for Canadian cheese). The total AMS is reduced by 21.9 percent between 1986-88 and 1990.

The results reported in Tables 1 and 2 assume a 1986-88 base period, but a variety of different base periods have been proposed. The Hellstrom proposal made at the December meeting in Brussels used a 1990 base, but the European Community found that base period unacceptable, so 1986-90 and 1988-90 have been suggested as possible compromises. The original EC proposal used a 1986 base, and the de Zeeuw framework paper used a base year of 1988 for policy prices and 1986-88 for reference (world market) prices. Table 3 reports AMS credits by sector and country under alternative base period rules. The corresponding future reductions needed to meet a 30 percent AMS reduction requirement are reported in Appendix Table A.1. Important results include the following:

- Different countries and interest groups would clearly rate the various base period proposals differently. Total U.S. credits are maximized with a 1986-88 or 1986-90 base period, but U.S. dairy credits are greatest with a 1986 base. Total EC, Japanese, and Canadian credits are maximized with a 1986 base, but Canadian dairy credits are actually minimized with a 1986 base. Under all the base periods examined, the calculated total U.S. AMS credit for 1990 is

Table 3. 1990 AMS credits under alternative base periods

	1986-88	1986-90	1988-90	1986	1988/ 1986-88
United States			(Percent)		
Crops	25.0	24.0	14.2	20.0	16.6
Dairy	10.8	10.3	8.4	14.2	5.4
Total	21.4	20.7	12.6	18.7	13.7
European Community					
Crops	10.3	8.0	2.7	12.7	1.5
Dairy	5.3	4.0	2.3	10.2	1.8
Livestock	8.6	6.6	5.1	9.8	8.4
Total	8.1	6.2	3.7	10.9	4.5
Japan					
Crops	7.5	4.4	-2.0	18.3	-4.6
Dairy	-4.8	-2.6	-1.4	-0.6	-5.1
Total	5.5	3.2	-1.9	15.5	-4.7
Canada					
Crops	49.3	34.0	-38.7	63.7	-99.1
Dairy	-8.1	-5.9	-2.3	-13.2	-1.9
Total	21.9	12.6	-13.2	33.3	-22.2

Note: Credits are defined as the percentage reduction in the AMS between the base period and 1990. Each column reports the results of using a different base period. The column labeled 1988/1986-88 utilizes a 1986-88 average world market price as the reference price, but uses 1988 data for all other variables.

larger than that for the European Community or Japan. Canadian credits are particularly sensitive to the choice of base period.

- For the **United States**, the AMS credits are uniformly larger for the crop sector than for the dairy sector. Not only were target prices reduced for the grains and cotton, but paid diversion programs were eliminated and Farmer-Owned Reserve payments were sharply reduced. Credits generally are larger the earlier the base period because support prices were reduced consistently in the late 1980s.

- The effect of different base periods on the reference price somewhat confuses matters. For most commodities, world prices were very low in 1986 and 1987, but very high in 1988. A given change in target prices or dairy support prices results in approximately the same absolute change in AMS, regardless of the base period, but the percentage change depends on the base period AMS level, which in turn depends on the average world price during the base period.

- In the **European Community**, levels of support generally have been reduced over time; thus, as in the United States, AMS credits generally are larger the earlier the base period. Unlike the U.S. crop sector, where fixed program yields and base acreages limit the production eligible for support, the AMS for EC crops varies proportionately with the size of the crop. The EC AMS for dairy products, on the other hand, is limited by the size of the marketing quota, whereas there is no restriction on the amount of U.S. dairy production eligible for support.

- For **Japanese** crops (primarily rice), credits are generally larger the earlier the base period because of consistent reductions in the government purchase price for rice between 1986 and 1988. Negative credits with a 1988-90 or 1988/1986-88 base period can be attributed to increases in production since 1988. For Japanese dairy products, increasing production results in small negative credits for 1990, regardless of the base period.

- Government payments to the crop sector in **Canada** were very high in 1986 and 1987 because of the Special Canadian Grains Program. Payments were very low in 1988, but then increased in 1989 and 1990. Thus, Canadian crop sector credits are greatest when the base period includes 1986 and 1987 and smallest when it includes 1988. Rising support prices mean that dairy sector credits become more negative the earlier the base period.

For the United States, 1990 AMS estimates do not incorporate the effects of new agricultural and budget legislation. Particularly important is the triple-base program mandated by OBRA-90. By reducing the amount of production eligible for payments, the triple-base program should reduce the calculated AMS for U.S. grains and cotton. Table 4 presents estimates of 1991 U.S. AMS credits under alternative base period rules. Appendix Table A.2 reports the corresponding future AMS reductions necessary to achieve a 30 percent reduction from the base period. These estimates incorporate provisions of FACTA-90 and OBRA-90, as well as announcements by the secretary of agriculture concerning Acreage Reduction Program (ARP) rates and other parameters of the 1991 farm program.

AMS calculations depend on a variety of factors not known with certainty at this time, such as the participation rate in the grain and cotton programs and production levels for sugar and dairy products. For these variables, Food and Agricultural Policy Research Institute (FAPRI) (1991) estimates are utilized. Important results include the following:

- The United States earns even larger AMS credits in 1991 than in 1990 for most commodities. In fact, if the base period is 1986-88 or 1986-90, the total AMS reduction is sufficient in 1991 to meet a 30 percent AMS reduction requirement (although the commodity-specific reductions for sugar, rice, and dairy products are not). If the Hellstrom proposal is adopted and a 1990 base year is used, the United States earns credits in 1991 for the grains and cotton and a total credit of 14.7 percent.

Table 4. 1991 U.S. AMS credits under alternative base periods

	1986-88	1990	1986-90	1988-90	1986	1988/ 1986-88
Feed Grains				(Percent)		
Corn	44.1	17.8	43.4	36.6	35.7	36.8
Barley	61.8	13.4	65.0	100.0	41.6	53.3
Sorghum	47.3	22.2	45.5	36.6	42.2	40.2
Oats	100.0	-223.3	100.0	100.0	55.1	100.0
Food Grains						
Wheat	38.5	26.8	38.4	31.9	40.9	27.4
Rice	15.9	13.9	15.2	13.5	12.6	15.4
Sugar	0.2	-13.0	0.1	-1.4	-14.6	5.2
Cotton	38.5	16.9	35.8	22.3	42.1	32.3
Crop Subtotal	37.1	18.7	36.6	28.4	33.1	30.0
Dairy Products	12.7	3.6	12.8	12.4	15.6	7.4
Butter	29.7	-2.5	28.3	27.6	32.3	28.1
Cheese	4.2	-0.7	5.1	3.7	4.9	-1.1
Nonfat Dry Milk	7.9	-2.5	-5.2	-119.0	30.2	-25.5
Net Payments	83.0	81.4	82.1	81.7	84.7	83.4
Total	30.8	14.7	30.7	23.9	29.1	24.1

Note: Credits are defined as the percentage reduction in the AMS between the base period and 1991. Each column reports the results of using a different base period. The column labeled 1988/1986-88 utilizes a 1986-88 average world market price as the reference price, but uses 1988 data for all other variables.

- For **feed grains**, the United States earns more than a 30 percent credit in 1991 under all base periods except 1990. With a 1990 base year, the triple-base program results in a 17.8 percent credit for corn and comparable credits for sorghum and barley (the AMS for oats actually increases in 1991 because of a projected sharp increase in the oat program participation rate).

- The situation for **wheat** is similar to that for feed grains, although the exact credits vary somewhat. With a 1990 base year, the 1991 wheat AMS credit of 26.8 percent is larger than the corresponding credit for corn. The amount of wheat eligible for support is reduced both by the triple-base program and by an increase in ARP rates (from 5 percent in 1990 to 15 percent in 1991), and the triple-base effect for corn is partially offset by a reduction in ARP rates.

- **Rice** AMS credits generally are smaller than those for other grains. One reason is that the proportional decline in rice deficiency payment rates is less than that for other grains. Another reason is that the proportional decline in ARP rates is larger than that for most other commodities.

- **Sugar** loan rates have not changed since 1986. The variation in 1991 AMS credits under different base years is primarily attributable to changes in production. The large negative credit with a 1990 base year reflects the expected increase in sugar production in 1991 relative to the weather-damaged crop of 1990.

- For **cotton**, the picture is similar to that for feed grains and wheat. The 1991 credit with a 1990 base year is comparable to that for corn because the 1991 ARP rate for cotton is also reduced relative to the 1990 level.

- **Dairy** product AMS credits generally are smaller than those for crops. The largest credits are for butter because butter purchase prices have been sharply reduced in recent years. The AMS for nonfat dry milk has actually increased since 1988 because nonfat dry milk purchase prices were increased. The large credits listed for Net Payments in Table 4 reflect the effects of

producer assessments included in the new legislation. Negative 1991 credits for butter, cheese, and nonfat dry milk are reported for a 1990 base year because support prices remain unchanged and production is expected to increase in 1991 relative to 1990.

- The essential point to be gained from Table 4 is that the choice of base period has important implications that differ across commodities. For many commodities and base periods, the U.S. AMS credits for 1991 are sufficiently great that no further support reductions would be required under a GATT agreement mandating modest AMS reductions. For other commodities and base periods, credits may actually be negative. No single base period is best for producers of all commodities.

Export Subsidy Measures

In the GATT negotiations, the United States and the Cairns Group of exporting countries (including Canada) have argued that export subsidies are especially pernicious and that specific disciplines are needed to sharply reduce their use. At least three ways of measuring export subsidies have been suggested:

1. Total budgetary expenditures on export subsidies,

2. Per-unit export subsidies, and

3. The quantity exported with subsidies.

In addition, some parties have argued that deficiency payments on exported quantities be considered export subsidies, whereas the United States has argued that deficiency payments should be disciplined only under internal supports. As in the previous section, a number of simplifying assumptions are used to make the problem tractable:

1. No attempt is made to estimate the quantities exported with subsidies because such information is often difficult to obtain. This omission is important because a

quantitative rule would be very likely to give different estimates of reductions than the per-unit or budgetary expenditure rules would give.

2. In general, export subsidies are assumed to equal the difference between internal and world market prices. Quality differences, the timing of sales, and a variety of other factors mean that this assumption may be inappropriate in many circumstances.

3. For the United States, export expenditures for the major crop commodities are assumed to consist of Export Enhancement Program (EEP) expenditures and, under one alternative, deficiency payments on exported commodities. The total expenditure estimates are simply divided by total exports to provide an estimate of per-unit subsidies. This results in a downward bias in the per-unit subsidy estimates because some commodities are exported without subsidy.

4. Only the United States and the European Community are considered. Export subsidies by other major trading countries are generally insignificant.

As with AMS measures, a base period for comparison is necessary. Table 5 reports percentage reductions in export subsidies between a 1986-88 base period and 1990. The corresponding estimates of required export subsidy reductions from 1990 levels needed to achieve a 30 percent reduction from the base period are reported in Appendix Table A.3. It should be noted that the U.S. estimates assume that EEP expenditures for the current fiscal year will be limited to $425 million. Pending legislation would remove the cap on EEP expenditures, and higher EEP expenditures would reduce the reported export subsidy reductions. Important results include the following:

● Given the assumed EEP level for 1990/91, the **United States** achieves significant export subsidy reductions relative to a 1986-88 base period for all crop commodities. This result holds, regardless of whether subsidies are measured on a per-unit basis or in terms of total

Table 5. 1990 export subsidy reductions under a 1986-88 base period

| | United States | | | | European Community | |
| | Per Unit | | Total Expenditure | | Per | Total |
	Excluding Deficiency	Including Deficiency	Excluding Deficiency	Including Deficiency	Unit	Expenditure
Feed Grains	(Percent)		(Percent)		(Percent)	
Corn	NA	45.3	NA	33.2	100.0	100.0
Barley	21.0	25.6	41.8	49.4	-9.6	-4.6
Sorghum	NA	36.9	NA	36.1	NA	NA
Food Grains						
Wheat	26.7	26.6	41.8	40.6	-32.3	-63.3
Rice	37.5	26.3	41.8	34.9	NA	NA
Cotton	NA	73.8	NA	71.8	NA	NA
Crop Subtotal	NA	NA	41.8	42.0	NA	-37.7
Dairy Products	NA	NA	71.8	71.8	NA	35.9
Butter	39.3	39.3	-40.4	-40.4	2.4	74.6
Cheese	58.8	58.8	70.7	70.7	10.5	-9.2
Nonfat Dry Milk	37.1	37.1	95.8	95.8	20.9	16.7
Livestock	NA	NA	NA	NA	NA	-11.7
Beef	NA	NA	NA	NA	-10.0	10.5
Pork	NA	NA	NA	NA	-134.8	-123.9
Poultry	NA	NA	NA	NA	-30.6	-92.2
Total	NA	NA	52.1	44.0	NA	1.1

Note: Reductions are defined as the percentage reduction in the export subsidy between the base period (1986-88) and 1990. For the United States, export subsidies include Export Enhancement Program (EEP) expenditures, subsidized dairy product sales, and (in the second and fourth columns) deficiency payments on exported commodities. For the European Community, export subsidies are equal to the difference between internal and world prices.

expenditures and whether the measures include or exclude deficiency payments on exported commodities. The fact that results are similar whether or not deficiency payments are included for barley, wheat, and rice is coincidental. Lower deficiency payment rates would result in export subsidy reductions, whether or not EEP expenditures had been reduced.

- For U.S. dairy products, per-unit expenditure subsidies are reduced in 1990 because world market prices (in U.S. dollars) are higher than they were during the 1986-88 base period. Butter expenditures increase because of an increase in U.S. butter exports from government stocks. Nonfat dry milk expenditures fall because of the very low level of U.S. nonfat dry milk exports in 1990.

- Low world prices combined with an appreciation of the European Currency Unit (ECU) relative to the U.S. dollar have resulted in an increase in per-unit subsidies for wheat and barley, despite lower internal prices in the European Community. An increase in wheat exports since 1986-88 results in an even larger percentage gap when subsidies are measured in terms of total expenditures. This result is very important because it poses a dilemma for the European Community. EC AMS credits are maximized when a base period extending back to 1986 is utilized, but using an early base period would require very large reductions in wheat export subsidies if an expenditure (or quantity) rule is used.

- For dairy products, the European Community has achieved small reductions when export subsidies are measured on a per-unit basis. For butter, the export expenditure reduction is much larger because of a sharp reduction in subsidized EC butter exports. Cheese exports, on the other hand, have increased since 1986-88.

- Increases in per-unit meat subsidies in the European Community can be attributed in large part to the increase in the value of the ECU since 1986-88. Beef exports declined

significantly between 1986-88 and 1990, resulting in a reduction in export subsidy expenditures.

The importance of the base period in establishing rules to restrict export subsidies is shown in Table 6. The estimates of 1990 export subsidy reductions are based on an expenditure rule that excludes U.S. deficiency payments. The corresponding estimates of future export subsidy reductions required to meet a 30 percent reduction requirement are reported in Appendix Table A.4. Important results include the following:

- U.S. export subsidy reductions vary dramatically as the base period changes, primarily because of changes in EEP expenditures and in subsidized dairy product exports. At one extreme, estimated export subsidies increased by 22.5 percent between 1988 and 1990, largely because EEP expenditures are now higher than they were in 1988/89. At the other extreme, a 1986 base period yields a 1990 reduction of 56.7 percent because EEP expenditures are now lower than they were in 1986/87 and subsidized exports of butter and other dairy products have been reduced.

- Regardless of the base year, EC 1990 export subsidies are greater than those in the base period for crop and livestock products and less than those in the base period for dairy products. These effects approximately offset each other, so that the total export subsidy reduction ranges from negative 7.7 percent with a 1986 base to 2.8 percent for a 1988 base. It is interesting to note that the base period that results in the largest U.S. reduction (1986) results in the largest 1990 subsidy increase for the European Community.

- One reason that export subsidy reductions are very sensitive to base periods is that, unlike AMS estimates, export subsidy estimates do not utilize a fixed reference price. Where export subsidies are the difference between a fixed internal price and actual world prices (as in the European Community), per-unit export subsidy calculations will depend on all the factors that

Table 6. 1990 export subsidy expenditure reductions under alternative base periods

	1986-88	1986-90	1988-90	1986	1988
United States			(Percent)		
Crops	41.8	25.5	-26.2	33.9	-21.4
Dairy	71.8	62.6	14.7	81.7	-26.9
Total	52.1	38.0	-15.0	56.7	-22.5
European Community					
Crops	-37.7	-30.9	-27.3	-33.4	-40.3
Dairy	35.9	24.0	15.3	17.4	39.1
Livestock	-11.7	-5.0	-1.2	-6.6	-12.8
Total	1.1	-3.1	-5.6	-7.7	2.8

Note: Reductions are defined as the percentage reduction in export subsidy expenditures between the base period and 1990. Deficiency payments are excluded from the U.S. figures.

affect world prices, as measured in domestic currency. In addition, export expenditures depend on the quantity exported, which is often a residual category (e.g., EC exports of most commodities and U.S. exports of dairy products) that is very sensitive to changes in such factors as weather and internal demand.

- Rules restricting export subsidies are likely to have a greater effect on the European Community than on the United States. One reason is simply that U.S. export subsidies are much smaller than EC export subsidies, even if deficiency payments are included in U.S. subsidy estimates. The other reason is that restrictions on export subsidies are likely to place limits on the difference between internal EC prices and world prices, at least at the margin. This is likely to imply more variability in prices received by EC producers as changes in world market prices are transmitted to the internal market. This imposition of world price variability on the internal market is a major reason that the European Community has resisted separate export subsidy disciplines.

Exchange Rates and Tariffs

Reducing tariff and nontariff barriers to imports has long been a primary focus of the GATT. The United States and Cairns Group countries have proposed that existing nontariff barriers to agricultural imports be converted into tariffs and that these tariffs be reduced over time. The European Community has been reluctant to endorse tariffication unless it is done in such a way as to buffer changes in world prices and exchange rates.

For purposes of this section, tariffs or tariff equivalents are defined as the absolute difference between internal and world prices, adjusted for transportation and marketing costs where appropriate. In Table 7, 1990 tariff reductions are reported for two different base periods (1986-88 and 1988-90) and two different rules regarding exchange rates (using the actual exchange rate for each year or fixing the exchange rate at the average exchange rate during the base period). Appendix Table A.5

Table 7. 1990 tariff reductions under alternative exchange rate and base period rules

	1986-88		1988-90	
	1990 Exchange Rate	1986-88 Exchange Rate	1990 Exchange Rate	1988-90 Exchange Rate
United States	(Percent)		(Percent)	
Sugar	39.1	39.1	13.8	13.8
Butter	66.3	66.3	33.0	33.0
Cheese	16.5	16.5	-16.0	-16.0
Nonfat Dry Milk	-22.4	-22.4	-89.0	-89.0
European Community				
Wheat	9.5	12.9	-8.9	-8.1
Barley	8.8	12.1	-8.0	-7.0
Corn	16.0	19.4	-0.7	0.2
Rice	6.8	10.7	-4.3	-3.4
Sugar	27.4	35.8	6.4	11.6
Butter	2.4	8.5	-5.2	-1.6
Cheese	10.5	17.4	-4.1	0.2
Nonfat Dry Milk	20.9	40.3	-77.0	-50.9
Beef	-10.0	18.3	-4.5	8.4
Pork	-134.8	-40.6	-6.0	12.7
Poultry	-30.6	10.5	-31.2	-11.6
Japan				
Wheat	16.7	15.3	-2.5	-4.5
Barley	16.1	14.2	-2.0	-4.5
Rice	3.6	2.8	0.1	-0.6
Milk Products	6.4	5.3	-2.6	-5.1
Beef	32.9	32.6	18.6	15.4
Pork	12.0	11.8	12.2	6.1
Canada				
Butter	-4.4	0.6	-9.4	-8.4
Cheese	-5.0	0.4	-7.5	-6.5
Nonfat Dry Milk	-2.1	11.4	-42.5	-38.2
Poultry	-131.3	-53.5	-36.5	-26.0

Note: Reductions are defined as the percentage reduction in tariff rates or tariff equivalents between the base period and 1990. Tariff equivalents are defined as the absolute difference between world and domestic prices, allowing for transportation costs.

converts the 1990 reductions reported in Table 7 to estimates of future reductions in tariff rates needed to achieve a 30 percent commitment from the base period. Important results include the following:

- Both base periods and exchange rate rules have an important effect on 1990 tariff reductions. In addition, changes in world and internal prices since the base period mean that reductions vary considerably across countries and commodities.

- Using the actual 1990 exchange rate rather than the average exchange rate during the base period reduces tariff reductions for the European Community. The difference is not constant across all commodities, primarily because the base period tariff equivalent is much larger for certain commodities (e.g., corn) than for others (e.g., pork). For Japan, the exchange rate rule seems to make little difference, in part because Japanese prices are so much higher than world prices, regardless of the exchange rate utilized. For Canada, fixing the exchange rate at base period levels results in larger positive or smaller negative reductions.

- Whether it is in the interest of a particular country to argue for fixed or actual exchange rates depends not only on the reductions achieved in 1990, but on the future path of exchange rates. If the U.S. dollar continues to depreciate over the next decade, as projected by The WEFA Group and others, then U.S. producers would benefit from using actual exchange rates and foreign producers would benefit from using fixed rates.

- As with the AMS and export subsidies, the choice of base period is crucial. To take an extreme example, the estimated 1990 EC pork tariff equivalent exceeds the 1986-88 level by 134.8 percent using actual exchange rates, but is 12.7 percent less than the 1988-90 level using fixed exchange rates. Average world prices for most other commodities were lower from 1986 to 1988 than from 1988 to 1990. As a result, 1990 reductions are generally

smaller when the later base period is used. In fact, many tariffs increased in 1990 because 1990 world prices are generally lower than those of 1988 and 1989.

- With few exceptions, most of the changes in tariffs from the base period have little or nothing to do with changes in agricultural policies since the base period. Effects of changes in world market prices and exchange rates have tended to swamp any effects of changing policies. For a very few of the products listed in Table 7 are import barriers currently in the form of fixed import tariffs. Tariffying existing barriers will introduce price variability where it has not previously existed and will have important distributional effects that will depend crucially on the rules concerning base periods and exchange rates.

Concluding Comments

The primary objective of this paper is to demonstrate that the specific rules incorporated in a GATT agreement will have a significant effect on who benefits and who loses. To oversimplify slightly, U.S. producers would benefit most from rules that would require other countries to sharply reduce subsidies and protection while U.S. programs remain in place. The estimates reported here indicate that it is possible to devise sets of rules that seem fair, but that impose very different future obligations on the parties to the negotiations. This paper has focused on some of the rules that seem crucial to determining future obligations; it is hoped that more effort will be devoted to these and other related issues before an agreement is reached.

Many of the issues discussed in this paper would be less important if the GATT agreement were actually the beginning of a process to eliminate all trade barriers in agriculture. If that were the case, the way in which these issues are resolved would have effects only in the short term because the eventual elimination of all protection and subsidies would create the much-heralded "even playing field." However, the negotiations are expected, at best, to result in only a modest reduction in

barriers to free trade in the intermediate term. Thus, the way in which the various technical issues are resolved will have important distributional effects that will persist for quite some time.

APPENDIX

Table A.1. Required AMS reductions from 1990 levels to achieve a 30 percent AMS reduction from
           alternative base periods

	1986-88	1986-90	1988-90	1986	1988/ 1986-88
United States			(Percent)		
Crops	6.7	7.9	18.5	12.4	16.1
Dairy	21.5	21.9	23.5	18.4	26.0
Total	11.0	11.8	19.9	13.9	18.9
European Community					
Crops	21.9	23.9	28.1	19.8	28.9
Dairy	26.1	27.1	28.3	22.0	28.7
Livestock	23.5	25.1	26.3	22.4	23.6
Total	23.8	25.3	27.3	21.4	26.7
Japan					
Crops	24.3	26.8	31.4	14.3	33.1
Dairy	33.2	31.8	30.9	30.4	33.5
Total	25.9	27.7	31.3	17.2	33.2
Canada					
Crops	0.0	0.0	49.5	0.0	64.9
Dairy	35.3	33.9	31.6	38.2	31.3
Total	10.4	19.9	38.1	0.0	42.7

Note: Required reductions are the percentage AMS reductions from 1990 levels required to achieve a
30 percent reduction in AMS from base period levels. Each column reports the results of using a
different base period. The column labeled 1988/1986-88 utilizes a 1986-88 average world market
price as the reference price, but uses 1988 data for all other variables.

Table A.2. Required U.S. AMS reductions from 1991 levels to achieve a 30 percent AMS reduction from alternative base periods

	1986-88	1990	1986-90	1988-90	1986	1988/ 1986-88
Feed Grains			(Percent)			
Corn	0.0	14.8	0.0	0.0	0.0	0.0
Barley	0.0	19.2	0.0	0.0	0.0	0.0
Sorghum	0.0	10.0	0.0	0.0	0.0	0.0
Oats	0.0	78.3	0.0	0.0	0.0	0.0
Food Grains						
Wheat	0.0	4.4	0.0	0.0	0.0	3.6
Rice	16.8	18.7	17.5	19.1	19.9	17.3
Sugar	29.9	38.1	29.9	31.0	38.9	26.2
Cotton	0.0	15.8	0.0	9.9	0.0	0.0
Crop Subtotal	0.0	13.9	0.0	2.2	0.0	0.0
Dairy Products	19.8	27.4	19.7	20.1	17.1	24.4
Butter	0.4	31.7	2.4	3.3	0.0	2.6
Cheese	26.9	30.5	26.2	27.3	26.4	30.8
Nonfat Dry Milk	24.0	31.7	33.5	68.0	0.0	44.2
Net Payments	0.0	0.0	0.0	0.0	0.0	0.0
Total	0.0	17.9	0.0	8.0	1.3	7.8

Note: Required reductions are the percentage AMS reductions from 1991 levels required to achieve a 30 percent reduction in AMS from base period levels. Each column reports the results of using a different base period. The column labeled 1988/1986-88 utilizes a 1986-88 average world market price as the reference price, but uses 1988 data for all other variables.

Table A.3. Required export subsidy reductions from 1990 levels to achieve a 30 percent export
subsidy reduction from a 1986-88 base period

| | United States | | | | European Community | |
| | Per Unit | | Total Expenditure | | | |
	Excluding Deficiency	Including Deficiency	Excluding Deficiency	Including Deficiency	Per Unit	Total Expenditure
Feed Grains	(Percent)		(Percent)		(Percent)	
Corn	NA	0.0	NA	0.0	0.0	0.0
Barley	11.4	5.9	0.0	0.0	36.1	33.1
Sorghum	NA	0.0	NA	0.0	NA	NA
Food Grains						
Wheat	4.5	4.6	0.0	0.0	47.1	57.1
Rice	0.0	5.0	0.0	0.0	NA	NA
Cotton	NA	0.0	NA	0.0	NA	NA
Crop Subtotal	NA	NA	0.0	0.0	NA	49.2
Dairy Products	NA	NA	0.0	0.0	NA	0.0
Butter	0.0	0.0	50.1	50.1	28.3	0.0
Cheese	0.0	0.0	0.0	0.0	21.8	35.9
Nonfat Dry Milk	0.0	0.0	0.0	0.0	11.5	16.0
Livestock	NA	NA	NA	NA	NA	37.3
Beef	NA	NA	NA	NA	36.4	21.8
Pork	NA	NA	NA	NA	70.2	68.7
Poultry	NA	NA	NA	NA	46.4	63.6
Total	NA	NA	0.0	0.0	NA	29.2

Note: Required reductions are the percentage export subsidy reduction from 1990 levels required to
achieve a 30 percent reduction in export subsidies from the base period levels. For the United States,
export subsidies include Export Enhancement Program (EEP) expenditures, subsidized dairy product
sales, and (in the second and fourth columns) deficiency payments on exported commodities. For the
European Community, export subsidies are equal to the difference between internal and world prices.

Table A.4.   Required export subsidy expenditure reductions from 1990 levels to achieve a 30 percent export subsidy reduction from alternative base periods

	1986-88	1986-90	1988-90	1986	1988
United States			(Percent)		
Crops	0.0	6.0	44.5	0.0	42.3
Dairy	0.0	0.0	17.9	0.0	44.8
Total	0.0	0.0	39.1	0.0	42.9
European Community					
Crops	49.2	46.5	45.0	47.5	50.1
Dairy	0.0	7.9	17.4	15.3	0.0
Livestock	37.3	33.3	30.8	34.3	37.9
Total	29.2	32.1	33.7	35.0	28.0

Note: Required reductions are the percentage export subsidy expenditure reductions required to achieve a 30 percent reduction in export subsidy expenditures from the base level. Deficiency payments are excluded from the U.S. figures.

Table A.5.   Required tariff reductions from 1990 levels to achieve a 30 percent tariff reduction
under alternative exchange rate and base period rules

	1986-88		1988-90	
	1990 Exchange Rate	1986-88 Exchange Rate	1990 Exchange Rate	1988-90 Exchange Rate
United States	(Percent)		(Percent)	
Sugar	0.0	0.0	18.8	18.8
Butter	0.0	0.0	0.0	0.0
Cheese	16.2	16.2	39.7	39.7
Nonfat Dry Milk	42.8	42.8	63.0	63.0
European Community				
Wheat	22.7	19.6	35.7	35.2
Barley	23.2	20.4	35.2	34.6
Corn	16.7	13.2	30.5	29.9
Rice	24.9	21.6	32.9	32.3
Sugar	3.6	0.0	25.2	20.8
Butter	28.3	23.5	33.5	31.1
Cheese	21.8	15.3	32.8	29.9
Nonfat Dry Milk	11.5	0.0	60.5	53.6
Beef	36.4	14.3	33.0	23.6
Pork	70.2	50.2	34.0	19.8
Poultry	46.4	21.8	46.6	37.3
Japan				
Wheat	16.0	17.4	31.7	33.0
Barley	16.6	18.4	31.4	33.0
Rice	27.4	28.0	29.9	30.4
Milk Products	25.2	26.1	31.8	33.4
Beef	0.0	0.0	14.0	17.3
Pork	20.5	20.6	20.3	25.5
Canada				
Butter	33.0	29.6	36.0	35.4
Cheese	33.3	29.7	34.9	34.3
Nonfat Dry Milk	31.4	21.0	50.9	49.3
Poultry	69.7	54.4	48.7	44.4

Note: Required reductions are the percentage tariff or tariff-equivalent reductions from 1990 levels
required to achieve a 30 percent reduction from base period levels. Tariff equivalents are defined as
the difference between world and domestic prices, adjusted for transportation costs.

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