

Open Regionalism in APEC: Impacts on U.S. Agriculture and Trade

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I. Introduction

The Asia Pacific Economic Cooperation (APEC) forum, a loose-knit 18-member regional institution, could assume a more pivotal role in the integration of the Pacific Rim, a market for more than 60 percent of U.S. agriculture and food exports. In 1994 APEC announced its “Bogor Declaration”, a plan to achieve free-trade in 2010 for developed members and 2020 for other members. Its free-trade plan calls for “open regionalism,” allowing benefits from trade liberalization undertaken by members to accrue not only to APEC members but to non-APEC members as well.

What is APEC?--The Asia Pacific Economic Cooperation (APEC) forum is made up of 18¹ diverse Pacific Rim economies (table 1), including the United States, and represents a significant regional market for U.S. food and agriculture trade. In FY 1997, the APEC region accounted for more than 60 percent of U.S. agriculture and food exports and 50 percent of imports. It also accounted for practically all the growth in U.S. non-bulk exports in the past 10 years. The region covers North America, East Asia including China, Southeast Asia, Oceania, and only Chile in South America.

The APEC has a relatively short history, initiated in 1989. It is an outgrowth of other loose-knit fledgling Pacific Rim institutions, the most influential being the business-oriented Pacific Economic Cooperation Council (PECC) that was founded in 1980 by Australia and Japan.

Growth in intra-APEC farm trade so far not attributable to the APEC institution--In the APEC region, intra-regional agricultural trade, a measure of integration, has grown significantly in the last 15 years. The APEC region now rivals the EU with respect to intra-regional agricultural trade; 68 percent of APEC's agricultural exports in 1995 went to other members of APEC, compared with almost 70 percent in the EU, and the share has been rising steadily. But this integration so far is not attributable to the APEC institution. Rather it is driven by economic growth, policy reform, and the freer play of comparative advantage independent of the APEC institution. Economic growth in the region has outpaced the world average by about 30 percent for the past 10 years. Many APEC economies around the Pacific Rim have liberalized both domestic farm policies and agricultural trade, sometimes on their own initiative, and sometimes as the outcome of bilateral, regional, or multilateral trade negotiations independent of the APEC institution. Examples are NAFTA (1994), Closer Economic Relations between Australia and New Zealand (1983), unilateral reforms undertaken by New Zealand initiated in 1984, ASEAN's free trade agreement (1994), Uruguay Round Agreement implementation, and a number of bilateral agreements, notably the Japan-U.S. beef and citrus agreement (1988).

The Bogor Declaration of 1994--APEC could assume a far more pivotal role in the future process of Pacific Rim integration than it has since its inception in 1989. About six months after the signing of the Uruguay Round Agreement, APEC leaders issued their "Declaration of Common Resolve" in Bogor, Indonesia, on November 15, 1994, announcing that members would adopt the long-term goal of free and open trade and investment in the Pacific Rim region. This goal would be pursued by reducing barriers to trade and investment and by promoting the free flow of goods, services, and capital within the region.

APEC members pledged to pursue regional free trade on a Most Favored Nation (MFN) basis and to promote "open regionalism," allowing benefits from trade liberalization undertaken by members also to accrue to non-members. Developed economies would fully liberalize their economies by 2010 and other members by 2020. At the Osaka Ministerial in November 1995, APEC members reaffirmed the free trade goal, calling for comprehensive treatment, including controversial sectors like agriculture, but flexibility in dealing with various trade sectors in meeting this goal. Action plans were tabled at the Manila Ministerial in November 1996 for implementation beginning in 1997. Peer pressure would be the vehicle for ensuring comparability in commitments among the 18 economies. Members would pursue "concerted unilateral liberalization", but in consultation with and under the scrutiny of other members. Action plans would be updated and revised periodically at the annual Ministerial meetings.

With regard to agriculture, these initial action plans in some cases offered accelerated or broader implementation of commitments agreed to under the Uruguay Round Agreement. For example, Australia agreed to complete the reduction of bound rates for agricultural products by January 1999 instead of 2000. China, not a member of the WTO, but quite active in APEC, announced at the last APEC Ministerial in Vancouver that it would make significant tariff cuts on industrial and agricultural products by 2005. Other economies promised to accelerate trade-facilitating measures that would enhance food and agricultural trade such as liberalization of foreign investment in the transportation sector (Chile) and in expediting inspection procedures for highly perishable trade (South Korea).²

What is "open regionalism"?--The APEC plan for regional free trade is distinguished from other regional trade liberalization efforts by the ambiguous concept of "open regionalism," described in the report of the APEC Eminent Persons Group in 1993. This group was commissioned in 1992 to "enunciate a vision for trade in the Asia Pacific region..." and described "open regionalism" in their recommendations to leaders on regional trade liberalization, later adopted in the Bogor declaration:

...the [APEC] members would set a goal of achieving free trade in the region and indicate that they prefer to do so through further global liberalization but would pursue a regional path, on a GATT-consistent basis, if the favored strategy were not achievable. This would operationalize APEC's concept of "open regionalism" or "open economic association" in a new and effective manner.³

"Open regionalism", according to the report, would "obviate any charges that [APEC] was 'going regional',"⁴ a particular concern given the inconclusive status of the long drawn-out Uruguay Round negotiations at that time.

What are the pros and cons of "open regionalism"?--Detractors of APEC's "open regionalism" argue that the benefits from APEC liberalization should accrue only to members or to non-members who reciprocate with similar liberalization measures. Their view is that the non-discrimination principle embedded in the "open regionalism" concept should be applied conditionally by APEC to avoid the possibility that APEC liberalization would be exploited by "free riders", like the EU.⁵

Advocates of "open regionalism" argue that the nation doing the liberalizing is the greatest benefactor from such action; thus non APEC economies who free ride APEC's free trade measures by not offering reciprocal policy reform would not benefit as much as member economies. Remaining distortions would hamstring their ability to compete and take advantage of the opportunities in APEC. Therefore, what other economies do or do not do is not as important as what APEC members do. The APEC forum serves to encourage members to move forward on the "open regionalism" agenda.

Politically, it is viewed by some as naive to think that an economy will undertake liberalization without reciprocity. But recent examples suggest that the times may be changing. New Zealand unilaterally undertook extensive agricultural policy reforms in 1984. Left to face the market, New Zealand farmers, after going through a difficult adjustment period, have prospered. The recent Asian financial crisis also has demonstrated the importance of an economy's openness regarding trade, foreign investment and finance. The most severely affected economies in Asia were those whose economies were relatively closed and now face the *necessity* of unilateral reform to achieve economic recovery in a globalized world economy.

II. APEC's "open regionalism" in perspective

Given APEC's objective of free trade with "open regionalism" and the controversy around this approach, we evaluate the implications of APEC's "open regionalism" approach for the U.S. economy and

agriculture and compare it to two other alternatives: an exclusive APEC free trade area and multilateral free trade in which non-APEC economies undertake the same reform as APEC members. How does “open regionalism” compare with these other approaches with respect to impacts on national welfare⁶, trade creation and diversion, agriculture trade, farm income and prices? What are the impacts on APEC partners and economies outside the region? And what is the distribution of gains and losses across U.S. economic sectors in general and for agriculture in particular? The point of departure, the base case, assumes full implementation of the Uruguay Round, the NAFTA Agreement, and the 1996 FAIR Act. The reform scenarios assume eventual elimination of tariffs and some non-tariff barriers as well as export subsidies. Elimination of the Multi-Fiber Agreement (MFA) is assumed to be a part of the base case for WTO members and is eliminated in the case of the non-WTO members in the three liberalization scenarios [see the Box for details about the model and assumptions].

Welfare rises regardless of liberalization approach. The results from the recursive dynamic CGE analysis show that with all three liberalization approaches--an exclusive free trade area, open regionalism, and multilateral free trade--the overall welfare impacts are positive and vary in magnitude, with global gains smallest for the APEC free trade area option and largest for multilateral free trade (figure 1). The “open regionalism” option is in the middle. However, the increases in welfare in the United States and the rest of APEC from “open regionalism” are less than both the free trade area and multilateral options (figure 2). According to the simulation results, APEC welfare rises \$144-197 billion above baseline levels for the three options in 2010 [.64 to .88 percent increase] and from \$238 to \$363 billion in 2020 [.78 to 1.19 percent increase] (figure 3). The jump between 2010 and 2020 is explained by reducing the higher protection levels in the developing APEC economies and the liberalization-induced higher rates of economic growth from 2010 to 2020. The range of our welfare estimates are somewhat larger than results (\$130-300 billion) from various other APEC free trade simulations using similar policy coverage because of the dynamic features of our model which account for the accumulating effect of rising incomes and investment levels from trade liberalization.⁷ Nevertheless, our results show that the percentage welfare gains for APEC and the world are still modest (table 3).

Agriculture makes major contribution to overall gains in three alternatives. According to the results, agriculture contributes 55 to 70 percent of total welfare gains from liberalization of merchandise trade in APEC. For the United States, the share is even higher, 75 to 85 percent.⁸ These results are consistent with Dee (1997). The large share from agriculture is explained by high initial protection rates for food and agriculture products in East Asia; agriculture is a major sector of unfinished business from the Uruguay Round (table 2). With the freer play of comparative advantage after APEC trade liberalization, more

efficient resource allocation across the region will lead to significant increases in import demand for food and agriculture products, particularly in East Asia.

ROW unable to “free ride” on trade expansion from APEC’s “open regionalism.” Exports from non-APEC economies to the APEC region only increase 4 and 5 percent in 2010 and 2020 (\$49 and \$87 billion), slower than the APEC to non-APEC export expansion of 9 and 14 percent (\$120 and \$262 billion) under “open regionalism” (table 3, right panel). Total exports for non-APEC economies actually fall except for slight growth for the EU. When non-APEC economies liberalize their markets also, their exports expand at almost the same rate as in the APEC economies. The remaining protection in the non-APEC region has a taxing effect on their own production and exports, thus reducing their competitiveness on world markets in the “open regionalism” case. This is an incentive for non-APEC economies to follow APEC’s lead in liberalizing their own markets.

U.S. agricultural exports rise in all three cases, the least under “open regionalism.” U.S. net agricultural exports rise above baseline levels in all three cases, with the multilateral and free trade area options showing greater benefit than the “open regionalism” case (18 to 30 percent higher)(table5). Australia and Canada, the other major net agricultural exporters in the APEC region, reflect a similar pattern. Net agricultural exporters outside the region benefit from the “open regionalism” option and from the multilateral liberalization option even more because some important non-APEC economies have relatively more abundant agricultural land resources than APEC members in East Asia. The free trade area option diverts to APEC economies about \$19 billion in agricultural trade in 2010 and \$41 billion in 2020 from outside the APEC region.

U.S. agriculture does better under freer trade conditions regardless of approach. U.S. farm production and exports expand under all three options because of the further realization of comparative advantage under freer trade conditions. All sectors of U.S. agriculture expand, with food grain production expanding the most, more than 20 percent in 2010 and more than 45 percent in 2020, under each of the three options (table 4). Feed grain and livestock production expand by similar rates in both 2010 and 2020. The labor-intensive textile and apparel and light manufacturing sectors decline by about the same percentage in 2010 and 2020 under all three options.

U.S. farm prices and incomes rise. U.S farm prices rise under all three option in both 2010 and 2020. U.S. farm income also rises because of higher prices and more efficient use of production resources (figure 4).

III. Conclusions and policy implications

It may be too early to assess APEC’s bold free-trade plan. It still remains a plan with distant target

dates and uncertain implementation. However, the plan clearly puts APEC in a *potentially* more visible role in encouraging future regional integration in the Pacific Rim.

It is also apparent from the empirical assessment that all three options raise global and U.S. welfare above baseline levels. The multilateral option is the best from both a global and U.S. perspective. The “open regionalism” approach is second best for global welfare, but the least attractive for the United States. However, the differences in the welfare gains for the United States from the three options are not large. The impacts of the three options on U.S. agriculture also vary but are not large.

Ironically, the least attractive economic option for the United States, “open regionalism”, may be the best when both economics and politics are considered. Economically, its benefit is not much less than the other two and the adjustment cost to the U.S. economy is almost the same. Politically, “open regionalism” has the advantage of being non-discriminatory with regard to non-APEC members, a more acceptable, less threatening option from the perspective of the non-APEC world. It also has the advantage of being an agreement that would involve only 18 parties, not 132 as would be the case of multilateral liberalization under the auspices of the WTO.

A key point is that the “open regionalism” case assumes that the rest of the world does not offer reciprocal reforms. This assumption is used for convenience to highlight the differences in the three options. In reality, it is likely that as APEC pursues a course of “open regionalism,” the rest of the world would not stand still and free ride, given the widespread interest of many countries to participate in more open global markets. According to the simulation results, the non-APEC economies are unable to take advantage of free access to the APEC region because remaining distortions in their own markets act as a tax, limiting production efficiency and reducing exports. Non-APEC economies have a compelling incentive to follow the lead of APEC in liberalizing their own markets if they want to remain competitive with the APEC economies. Therefore, the United States under “open regionalism” might even be better off than our results indicate depending on the policy response from the non-APEC world. This analysis suggests that APEC “open regionalism” could very well be a vehicle for promoting not only regional but global free trade as well.

Finally, the results also point out the critical role of agriculture policy reform to the overall gains in welfare in the APEC region, particularly for the United States. Without liberalization in the region's agriculture, the United States would have much less incentive to participate in APEC's overall liberalization program

Endnotes

1. Russia, Vietnam, and Peru will be joining in 1998, making 21 economies the total membership.
2. Unpublished memorandum by Jeff Clark, ERS, January 5, 1996.
3. Report of the Eminent Persons Group to APEC Ministers, *A Vision for APEC, Towards an Asia Pacific Economic Community*, October 1993, pp 27-28.
4. Ibid., p. 28.
5. Trade Policy Forum, *Asia-Pacific and Western Hemisphere Regional Initiatives: Cooperation for Increasing Competition, Background Paper for Experts Roundtable*, Pacific Economic Cooperation Council, 12th General Meeting, Santiago, Chile, Sept. 29, 1997, p. 17.
6. We measure changes in national welfare by changes in household consumption, evaluated at base year prices.
7. Peter A. Petri, *Computable General Equilibrium Studies of APEC: Preliminary Review*, unpublished paper distributed at the PECC XII meeting in Santiago, Sept. 29, 1997.
8. Based on additional simulation which decomposes the welfare contribution from agriculture.

The Model and Assumptions Behind the Results

To estimate the impact of APEC trade liberalization on U.S. agriculture and trade, we used a recursive dynamic computable general equilibrium model of world production and trade. The model divides the world into 12 regions, and classes all goods and services into 12 sectors, produced by five production factors--agricultural labor, unskilled labor, skilled labor, land and capital.

There are four sources of economic growth in the model: labor force growth, accumulation of physical capital, changes in the skill composition of the labor force, and total factor productivity (TFP) growth.

The labor force growth rate is set exogenously. It was calculated from the International Labor Office's population and labor force projections from 1990 to 2020, which take the demographic structure and labor force participation rates into consideration.

Capital stock in each simulation period equals the last period's capital stock plus total investment minus depreciation. No optimal behavior is assumed for investment and capital accumulation. All net investments in the previous period are assumed to become new production capital in the next period.

Agricultural labor and urban unskilled labor are not substitutable in production, but linked by rural-urban migration flows, which are endogenous in the model and driven by the rural-urban wage differential and structural changes in production and trade. The increase in the skilled labor force is based on the growth in the stock of tertiary educated labor in each region estimated by the World Bank (Ahaja and Filmer, 1995), which provides an indication of changes in the numbers of those qualified for employment as professional and technical workers.

TFP growth rates are obtained from econometric estimates by the World Bank (Martin and Mitra, 1996).

The major data source for the model is the Global Trade Analysis Project (GTAP) database, version 3. The model was implemented in General Algebraic Modeling System (GAMS) software. Detailed description of the structure and algebraic specification of the model can be found in Wang (1997a).

Four scenarios are simulated by the model. In the base scenario, the world economic growth path from 1992 to 2025 is generated, driven by the four sources of growth, assuming full implementation of the Uruguay Round and NAFTA, and that China and Taiwan do not participate in the Uruguay round liberalization process. For the baseline domestic agricultural support in the United States is assumed to be reduced by 95 percent as a result of the provisions of the 1996 FAIR Act and domestic support in other OECD countries and newly industrialized Asia is assumed to be lowered by 40 percent.

Three scenarios are compared with the base scenario: an APEC free trade area (FTRA), APEC trade liberalization on an MFN basis, the case of open regionalism (OPEN), and global trade liberalization under which non-APEC economies undertake policy reform in the same way as APEC (FULL). Liberalization means reducing import protection and export subsidies in the developed and newly industrialized economies [the United States, Canada, Japan, Australia, Korea, and Taiwan] of APEC to zero by 2010, and removing all import barriers of all other APEC economies [Mexico, China, and ASEAN] by 2020. China and Taiwan obtain the benefit from elimination of the MFA since they are not members of the WTO. The reduction in protection is equally distributed over the simulation period. All exogenous forces driving economic growth are the same as in the base scenario. The only differences among the three scenarios and the baseline are changes in each country's trade policy.

The model is a highly stylized simplification of the world economy that is far from perfect (Wang, 1997b). Liberalization of the service sector is not modeled. There are also uncertainties about the size of parameters, such as elasticities of substitution and initial rates of protection. Therefore, the numbers reported in this paper need to be interpreted with caution: they can be viewed as indicative but not as precise forecasts.

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Table 1-Factor endowment, intensity, and relative size of model regions, 1992

	USA	Canada	Mexico	Japan	Australia	Korea	Taiwan	China	ASEAN5	EU12	Rest OECD	Rest World
GDP and trade flows												
	<i>Billion U.S. dollars</i>											
GDP	5671.8	572.3	327.9	3644.9	285.4	307.3	211.5	461.2	389.9	6616.4	900.4	3047.7
Exports	573.8	140.0	56.2	378.4	48.7	83.4	92.0	122.0	176.0	734.0	267.6	453.5
Imports	640.5	144.0	72.7	309.5	52.8	90.2	83.3	141.3	183.2	788.8	254.4	544.6
Relative size in the world												
	<i>Percent</i>											
GDP	25.3	2.6	1.5	16.3	1.3	1.4	0.9	2.1	1.7	29.5	4.0	13.6
Exports	18.4	4.5	1.8	12.1	1.6	2.7	2.9	3.9	5.6	23.5	8.6	14.5
Imports	19.4	4.4	2.2	9.4	1.6	2.7	2.5	4.3	5.5	23.9	7.7	16.5
Trade dependence												
	<i>Percent</i>											
Exports/Output	10.1	24.5	17.1	10.4	17.1	27.1	43.5	26.5	45.2	11.1	29.7	14.9
Imports/Absorption	11.3	25.2	22.2	8.5	18.5	29.4	39.4	30.6	47.0	11.9	28.3	17.9
Share in world factor endowment												
	<i>Percent</i>											
Land	13.4	3.2	1.8	0.3	3.6	0.2	0.1	6.9	4.0	5.9	0.6	60.1
Agricultural Labor	0.2	0.0	0.8	0.3	0.0	0.4	0.1	41.7	6.1	0.8	0.1	49.4
Unskilled labor	8.1	1.0	1.8	4.7	0.6	1.3	0.7	17.7	6.0	11.0	1.1	46.1
Skilled labor	15.7	1.4	1.5	4.2	0.8	0.8	0.4	23.3	3.5	13.6	2.4	32.6
Total labor	5.2	0.6	1.3	2.6	0.4	0.8	0.4	29.4	5.8	6.5	0.8	46.2
Capital	23.3	2.2	1.4	17.5	1.5	1.0	0.6	1.8	1.4	30.6	4.7	14.0
Factor share in value-added												
	<i>Percent</i>											
Land	0.3	0.6	2.7	0.8	1.2	5.6	1.9	7.4	6.3	0.4	0.8	2.7
Agricultural Labor	1.3	2.9	4.9	2.3	1.5	5.5	4.8	17.1	7.3	3.5	2.6	7.0
Unskilled labor	33.6	33.2	12.5	41.5	34.7	35.6	45.4	17.8	17.5	39.4	29.4	27.6
Skilled labor	29.2	21.8	14.3	15.2	23.8	8.4	7.4	18.1	8.3	24.8	28.2	13.6
Total labor	64.1	57.9	31.7	58.9	59.9	49.4	57.6	53.0	33.2	67.7	60.2	48.1
Capital	35.6	41.5	65.6	40.3	38.8	45.0	40.5	39.6	60.5	31.9	39.1	49.2
Skill distribution of regional labor force												
	<i>Percent</i>											
Agricultural Labor	2.2	3.0	28.7	5.8	4.7	22.6	12.1	65.7	48.8	5.5	5.1	49.5
Unskilled labor	66.8	72.6	59.4	77.8	72.2	67.7	76.9	26.1	45.0	72.9	62.8	43.3
Skilled labor	31.1	24.5	11.9	16.4	23.1	9.7	11.0	8.2	6.2	21.6	32.2	7.3
Annual Wages												
	<i>US\$ 1,000 per worker</i>											
Agricultural Labor	26.6	38.0	1.6	21.1	10.0	3.3	8.5	0.1	0.4	26.1	23.8	0.4
Unskilled labor	22.0	18.0	2.0	28.2	15.4	7.2	12.6	0.4	0.9	22.3	21.9	1.6
Skilled labor	41.0	35.1	11.3	48.9	33.1	11.8	14.5	1.2	3.2	47.4	41.0	4.7
Average wages	28.0	22.8	3.0	31.2	19.3	6.7	12.4	0.3	0.8	27.9	28.1	1.2
Average land rent												
	<i>US\$ 1,000 per hectare</i>											
Average land rent	8.5	7.2	31.1	612.6	6.6	730.6	406.1	28.4	37.5	29.9	74.3	9.1
Average capital rental												
	<i>Percent of capital stock</i>											
Average capital rental	12.1	14.6	19.3	11.2	10.2	17.3	19.4	11.4	20.5	9.7	10.2	14.3
Capital(land) intensity												
	<i>US\$ 1,000 per worker</i>											
Capital/labor	128.5	112.0	31.8	191.0	122.4	35.5	44.8	1.8	7.1	135.2	179.1	8.7
	<i>Hectares per worker</i>											
Land/labor	1.50	3.33	0.80	0.07	6.07	0.10	0.10	0.14	0.41	0.53	0.47	0.76
Relative factor prices												
	<i>Ratio</i>											
Rental/wage	0.4	0.6	6.5	0.4	0.5	2.6	1.6	41.3	25.6	0.4	0.4	11.7
Land rent/wage	0.3	0.3	10.5	19.6	0.3	108.5	32.9	102.5	46.7	1.1	2.6	7.5
Rental/land rent	1.4	2.0	0.6	0.0	1.6	0.0	0.1	0.4	0.6	0.3	0.1	1.6

Data source: Calculated from the 1992 multi-regional SAM estimated by the author from Version 3 GTAP database (Hertel, 1997) and additional factor endowment data collected by the authors (Wang, 1997).

Table 2 - Trade Average Protection Rate Faced by Each Region's Exports, post UR and NAFTA

	Merchandise average			Agricultural products			Non-agricultural products		
	APEC	Non-APEC	World	APEC	Non-APEC	World	APEC	Non-APEC	World
	<i>Percent</i>								
United States	9.28	7.53	8.47	60.57	20.8	43.57	4.68	9.32	6.66
Canada	2.64	6.52	3.23	28.09	15.26	24.06	0.8	5.86	1.41
Mexico	3.95	4.94	4.13	32.79	31.63	32.66	2.16	6.22	2.76
Japan	16.32	14.99	15.86	22.89	25.32	23.44	17.69	17.12	17.49
Australia	16.2	8.42	13.77	57.48	17	43.83	3.72	6.4	4.55
Korea	11.42	17.45	13.39	32.14	19.07	29.73	12.32	19.05	14.59
Taiwan	15.71	7.87	13.78	82.67	16.15	79.23	13.81	8.65	12.53
China	12.34	10.96	11.76	59.31	19.51	43.1	9.92	13.76	11.43
ASEAN 5	7.52	12.57	9.4	32.75	27.18	30.12	5.68	13.39	8.23
European Union	7.62	9.77	8.89	30.73	25.25	27.07	9.26	11.27	10.49
Rest of OECD	7.82	3.72	4.55	36.99	31.73	33.47	6.97	3.31	4.03
Rest of World	6.42	7.08	6.77	32.17	32.93	32.67	4.96	3.54	4.23

Data source: Calculated from the 1992 multi-regional SAM estimated by the author from version 3 GTAP database (Hertel, 1997).

The import protection rates for the food and agricultural sectors in China and South Asia were negative in version 3 GTAP.

They reflected government consumer price subsidies on living necessities in those countries.

We eliminated all negative protections and treated them as consumer price subsidies in the global SAM.

Protection rates for food and agricultural sectors in China and South Asia are based on an earlier version of the GTAP database except China's crop sectors, which are tariff equivalence of non-tariff barriers based on Zhang, et. al., 1997.

Table 3 The Impact of Alternative Scenarios on APEC Trade Liberalization

	Real Consumption						Exports					
	2010			2020			2010			2020		
	FTRA	OEPO	GLOBAL	FTRA	OEPO	GLOBAL	FTRA	OEPO	GLOBAL	FTRA	OEPO	GLOBAL
	<i>Percent change from base scenario</i>											
United States	0.17	0.09	0.19	0.45	0.31	0.51	11.0	13.4	13.6	10.0	11.8	12.2
Canada	-0.01	-0.10	-0.04	0.28	0.16	0.30	1.3	2.7	2.3	0.2	1.8	1.2
Mexico	-0.16	-0.32	-0.28	-0.35	-0.60	-0.53	1.4	2.9	2.2	3.6	6.4	5.6
Japan	1.39	1.36	1.68	1.67	1.59	1.99	18.2	16.6	18.6	20.4	18.3	20.6
Australia	0.82	0.49	0.71	1.68	1.09	1.58	9.4	11.1	10.8	7.5	9.5	9.1
Korea	1.59	1.61	2.24	2.04	1.91	3.05	28.7	31.5	33.9	30.5	32.6	37.0
Taiwan	2.14	1.78	1.84	3.11	2.49	2.65	19.0	20.3	20.3	21.2	21.8	22.0
China	1.74	1.86	2.18	1.24	1.54	2.05	29.1	34.6	36.0	47.4	56.0	57.9
ASEAN5	0.23	0.08	0.85	-0.29	-0.35	1.08	6.8	9.2	10.4	17.6	21.8	24.5
APEC	0.71	0.64	0.88	0.89	0.78	1.19	14.1	16.2	17.1	19.5	22.4	23.9
EU	-0.07	0.18	0.45	-0.06	0.31	0.86	-1.8	0.7	11.8	-2.5	0.8	12.9
Rest of OECD	0.16	0.47	0.61	0.23	0.76	1.10	-1.7	-1.6	3.6	-2.9	-2.6	2.9
Rest of the World	-0.21	0.01	-0.17	-0.31	0.14	-0.51	-2.9	-0.7	16.5	-3.5	-1.0	30.9
Total	0.33	0.41	0.58	0.41	0.54	0.77	7.2	9.2	15.1	10.2	13.0	22.3

Table 4 Impact of Alternative Scenarios on APEC Trade Liberalization on Structure of U.S. Economy

	Real Consumption						Production					
	2010			2020			2010			2020		
	FTRA	OEPO	GLOBAL	FTRA	OEPO	GLOBAL	FTRA	OEPO	GLOBAL	FTRA	OEPO	GLOBAL
	<i>Percent change from base scenario</i>											
Food grains	0.00	0.00	0.00	-0.73	-0.73	-0.73	29.4	20.0	24.6	55.8	44.8	49.5
Feed grains	0.00	0.00	0.00	0.00	0.00	0.00	9.8	8.1	10.3	6.6	6.2	7.1
Non-grain crops	0.20	0.61	0.54	0.03	0.43	0.37	11.0	6.7	22.6	22.0	17.3	32.1
Livestock products	-0.08	-0.03	-0.05	-0.15	-0.10	-0.11	10.9	6.8	9.4	11.9	6.8	10.1
Processed food	0.05	0.12	0.15	0.09	0.16	0.22	1.5	1.5	2.4	1.6	1.3	3.6
Agriculture	0.03	0.12	0.13	0.02	0.11	0.14	7.0	4.7	8.1	9.7	6.9	11.1
Forestry and fishery	0.21	0.15	0.29	0.59	0.43	0.69	1.4	1.7	1.7	0.9	1.3	1.6
Mining	0.00	0.00	0.00	0.00	0.00	0.00	-0.2	2.6	-0.1	-2.4	1.3	-3.4
Energy	0.05	-0.18	0.11	0.45	0.05	0.69	0.2	0.6	0.1	-0.1	0.5	-0.5
Textile and apparel	5.20	5.77	5.99	7.70	8.30	8.82	-16.2	-17.3	-17.3	-20.9	-21.9	-22.0
Other light manufactur	0.71	0.75	0.93	1.34	1.30	1.66	-0.8	-1.1	-1.4	-1.6	-2.0	-2.5
Durable goods	0.29	0.24	0.34	0.56	0.45	0.66	-0.6	-0.7	-0.7	-1.2	-1.4	-1.4
Services	-0.06	-0.19	-0.09	0.17	-0.02	0.15	0.3	0.5	0.5	0.5	0.7	0.7
Total	0.17	0.09	0.19	0.45	0.31	0.51	0.2	0.2	0.3	0.2	0.1	0.3

Table 5 Impact of Alternative Scenarios in APEC Trade Liberalization on U.S. Food and agricultural Trade

	Real exports						Real Imports					
	2010			2020			2010			2020		
	FTRA	OEPO	GLOBAL	FTRA	OEPO	GLOBAL	FTRA	OEPO	GLOBAL	FTRA	OEPO	GLOBAL
	<i>Percent change from base scenario</i>											
Food grains	46.3	31.2	36.2	76.1	61.2	67.1	6.9	5.3	6.0	20.7	17.5	19.3
Feed grains	11.3	15.2	25.8	-2.3	6.1	9.9	-2.7	-12.8	-9.2	5.7	-10.3	-7.1
Non-grain crops	43.0	41.0	53.6	57.1	52.3	61.8	44.7	72.5	76.6	59.6	83.4	91.5
Livestock products	93.2	66.2	76.7	78.8	50.4	61.8	9.8	28.3	24.7	12.8	30.5	26.1
Processed food	9.5	11.5	17.2	9.9	9.5	24.5	6.1	6.7	11.4	12.4	11.9	18.3
Agriculture	39.5	33.6	42.9	44.2	37.0	47.3	19.3	32.4	35.1	27.1	37.7	42.2
Forestry and fishery	12.3	15.5	16.5	10.1	14.3	17.2	1.4	1.6	2.8	2.9	2.6	4.0
Mining	2.5	11.3	5.8	-1.0	10.0	2.9	2.0	-1.0	3.2	3.9	-0.1	7.3
Energy	4.4	11.1	8.5	2.1	10.1	4.7	1.9	-1.1	3.3	4.5	0.1	8.6
Textile and apparel	11.3	15.6	19.9	1.5	5.0	13.1	39.9	44.1	45.6	47.4	51.1	53.9
Other light manufactur	-0.2	0.0	-3.0	-4.8	-4.9	-9.9	9.2	10.9	12.1	13.4	14.9	17.1
Durable goods	9.8	12.4	12.3	6.3	8.4	8.3	13.4	16.2	16.9	14.9	17.1	18.8
Services	1.4	7.0	3.2	-2.2	4.9	-0.2	0.4	-3.6	-0.8	3.2	-2.1	1.5
Total	11.0	13.4	13.6	10.0	11.8	12.2	12.8	14.5	16.1	15.2	16.0	18.9