Updating Study on the Impact of Trade Liberalization in APEC

*by CGE Modeling Unit, ERI/EPA**

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Chapter 1 Introduction

This paper presents a preliminary simulation for the economic impact of trade liberalization in APEC in line with the report on "Assessing APEC Trade Liberalization and Facilitation – 1999 Update" adopted by APEC in September 1999.

The "Manila Action Plan (MAPA)," which includes members' specified trade liberalization measures, was finalized at the APEC Ministerial Meeting in November 1996. Those specific liberalization measures of individual economies were quantified to changes in the exogenous variables in the Computable General Equilibrium (CGE) model. The EC undertook a series of studies on the impact of liberalization of trade and investment in APEC in 1997, and reports were submitted to the Ministerial Meeting in November 1997. *Impact of Trade Liberalization in APEC* was a research project that used a CGE model to assess the impacts of MAPA.

Facing several new demands to update the existing CGE component of the study, the Economic Research Institute of the Economic Planning Agency proposed to launch an update in 1999. It was desirable to revise the existing CGE estimate on the impact of APEC Individual Action Plans (IAPs) on each individual member economy, including the new members, once they submit their IAPs.

The database of the CGE Model used in the last study was updated in December 1998. The new database reflects more recent trade and industrial structures in the world. In the context of APEC, updating the database would provide us with background that reflects the rapid growth in the early 1990s.

The proposed study --"Updating the Estimates of the Impact of Trade Liberalization in APEC"-- includes:

- An update of CGE estimates by using new inputs reflecting IAPs improvements, and new IAPs of new members.
- A revision of the CGE model to enable the specific estimate of the impact

to selected new members. In the present version of the CGE database, the estimates to Russia (but including the former USSR only) and Vietnam are feasible, but that of Peru is not.

- An update of the CGE database. Most of the input-output tables and trade data have been significantly updated. The older version of the database was used for some data in 1980 or before, but the new version in principle uses data from 1990 and thereafter.

Our goals in this paper are threefold. The first goal is to calculate tariff data of APEC members, matching to the latest Individual Action Plans. The calculation is based on the Global Trade Analysis Project (GTAP) model's methodology. The second is to compare the economic effects of MAPA estimated by means of the Version 4 database to that by the Version 3 database. We try to examine whether the models used in the previous study are still appropriate to the new database. The last goal is to estimate the economic effects of the updated IAPs in various models.

This paper comprises four chapters. Chapter 1 is an introduction, and Chapter 2 reports on the practical operations of tariff data calculations, according to the Global Trade Analysis Project (GTAP) model's methodology. Chapter 3 reports on the building of the GTAP model, including key assumptions for running simulations, and Chapter 4 shows the outcome of model simulations, a comparison between database Version 3 and Version 4, and the effects of trade liberalization in APEC.

Chapter 2 Tariff Data Calculation[1]

This chapter reports on the practical operations of tariff data calculations, according to the GTAP methodology. In the GTAP database Version 4, tariff data are aggregated from detailed tariff line information using bilateral trade weight, denoted on an *ad valorem* basis.

The trade liberalization measures in the IAPs include two groups: those measures committed in the Uruguay Round (UR) negotiations, and those that go beyond the UR commitments. The latter measures include those committed in the Information Technology Agreement (ITA) as well as the unilateral liberalization in APEC. Twelve economies out of 21 APEC members joined the ITA. According to this classification, we calculate two cases. One is the baseline case, which presents the former, i.e., the tariff data only with measures committed in the UR negotiations, and the other is the controlled case, which includes unilateral measures beyond the UR commitments. Table 2-1 shows the highlights of the latest IAPs.

In this chapter, apart from the above classification, we take two time points: the base year point, and the future point. Here the base year point should be understood as the time point of the first IAP's submission date. The future point is the year 2010. We calculate four total datasets: 1) the base year case; 2) the baseline case of year 2010, which includes only UR (UR); 3) the controlled case of year 2010, which includes UR and MAPA (UR+MAPA); and 4) the controlled case of year 2010, which includes UR and updated IAPs (UR+IAP98). Figure 2-2 shows the image of time points and datasets.

[1] The method of calculation on this paper is based on that of the EPA (1998).

2.1 Liberalization Measures

a. Measures Committed in the Uruguay Round Negotiations

In the Uruguay Round (UR) negotiations, many trade liberalizing measures were agreed upon. Each WTO member economy has submitted implementation measures toward the UR commitments. The main elements of the UR commitments are shown below.

One of the most significant rule changes in agricultural trade set by the UR is tariffication, i.e., conversion of non-tariff measures (NTMs) into bound tariffs. After tariffication, the new bound tariffs must be reduced by at least 15 percent on each item and by 36 percent on a simple average basis over six years (1995-2000) in developed economies. The new bound tariffs must be reduced by at least 10 percent on each item and by 24 percent on a simple average basis over ten years (1995-2005) in developing economies. Concerning export subsidies, WTO member economies must reduce them by 36 percent on a total value basis over six years (1995-2000).

Many significant measures were also agreed upon in the UR negotiations in trade of manufactured goods. This liberalization includes the binding of previously unbound tariffs in both developed and developing economies and tariff reductions, as well as the phasing out of the discriminatory quantitative restrictions applied under the Multi-fibre Arrangement (MFA). Tariffs must be reduced by at least 33 percent (almost 40 percent in developed economies) from base rates on a trade weighted average basis over five years. The coverage of tariff binding was significantly expanded, especially in developing economies. The MFA will be abolished in January 2004.

b. Information Technology Agreement (ITA)

In the APEC Ministerial Meeting in Manila in November 1996, Ministers endorsed WTO efforts to conclude an information technology agreement by the Singapore Ministerial Conference (SMC), and urged all

other members of the WTO to work toward that end.[2] The liberalization of information technology products is being pursued because of the key role of trade in information technology products in the development of information industries and in the dynamic expansion of the world economy. 14 economies[3] have agreed to the ITA in the SMC. Table 2-3 reports the tariff elimination schedule of the ITA.

c. Individual Action Plans (IAPs)

Regarding tariffs, a sizable number of APEC economies submitted unilateral liberalization measures included in IAPs beyond the UR commitments.

For the quantitative assessment of IAPs, we created a tariff database consisting of baseline and controlled cases. Because each of two cases will be fed into models independently as exogenous variables, we are able to interpret the difference of simulation results as a trade liberalization effect due to IAPs. Table 2-4 shows the extent of tariff curtailment in terms of percentage point change of the future time point data from the base year date.

c. i. General Principles

The general principles across economies for calculating baseline data are as follows.

1) Database time points are of the base and the future years, i.e., 1996[4] and 2010. Data of the base year are calculated with trade and tariff information. The images of database time points and cases are shown in Figure 2-2.
2) Tariff rates are calculated according to the methodology of the GTAP

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[2] APEC (1996 c).

[3] They are Australia, Canada, Chinese Taipei, European Union, Hong Kong, Iceland, Indonesia, Japan, Korea, Norway, Singapore, Switzerland, Turkey, and the United States (underlined nine economies are APEC members). In addition, Malaysia, New Zealand, the Philippines, and Thailand are committed to the ITA. Among these four APEC member economies, New Zealand will be reducing tariffs on relevant commodities to zero by 2000, since it is an industrialized economy.

[4] The base year 1996 should be understood as the time point of MAPA. Years of the trade and tariff information are reported in Table 2-6.

database. They are calculated directly from data sources such as UNCTAD/TRAINS and WTO/IDB.

3) Tariff rates will be reduced according to the Uruguay Round (UR) commitments for future time points.
4) Export subsidies on agricultural commodities will be reduced by 36 percent according to the UR commitments.
5) MFA duties will be reduced with linearity according to the UR commitments.
6) Voluntary export restraints (VER) will be abolished according to the UR commitments.

The general principle across economies for calculating controlled data is as follows.

7) Tariff rates of information technology products are reduced to zero in industrialized ITA-participating economies and with linearity by specific committed year in developing economies.

c. ii. Individual Economy's Principle of Controlled Data

To calculate controlled data, we take into account the economy-specific unilateral measures shown below, apart from the tariff reduction attributed to the ITA.

Australia: tariff rates on passenger motor vehicles (PMV and components and PMV replacement parts) and textiles, clothing, and footwear are reduced according to the schedule reported in Table 2-5.

Canada: the rates of 714 tariff lines will be reduced by 1999 and those of 64 tariff lines by 2004.

Chile: tariff rates are reduced to zero for the year 2010.

China: rates of each tariff line for industrial products in years 2010 are regarded to be equal to current tariff rates simply multiplied by 10.8/17. Moreover, the other products are regarded to be equal to current tariff rates

simply multiplied by 15/17.

New Zealand: tariff rates are reduced to zero for year 2010.

The Philippines: tariff rates are reduced to 5 percent for year 2010 with the exception of sensitive agricultural commodities.

Singapore: tariff rates are reduced to zero for year 2010.

Chinese Taipei: rates of each tariff line in year 2010 are regarded to be equal to current tariff rates simply multiplied by 6.0/8.25.

2.2. Process of Calculations

a. Data Sources

We utilize three types of data sources: IAPs, UNCTAD/TRAINS, and WTO/IDB. Apart from these data sources, the tariff reduction schedule according to the ITA provides very useful information.

Two types of IAPs are available. One indicates specific tariff line information according to the 6-digit or more detailed level of the HS code classification. The other does not include it but summarizes the outline of the tariff reduction schedule. As to the latter, we interpret the information reported in the IAPs to applicable items according to the HS code.

b. GTAP Database

We prepared this paper to present tariff data calculations, evaluating IAPs in accordance with the GTAP database version 4. The GTAP tariff database has several characteristics: 1) tariff data are aggregated from detailed tariff line information using bilateral import weights; and 2) tariff data are denoted on an *ad valorem* basis.[5]

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[5] Hertel eds. (1997). Another characteristic is that tariff data of agricultural commodities include tariff equivalents of non-tariff measures (NTMs).

In general, the tariff rates are generated according to the following formula.[6] In short, tariff rates of each commodity group are calculated as aggregations from detailed tariff line information, weighted by bilateral import data.

$$t_{i,j}^{n} = \frac{\sum_{e \in EXPG_i} \sum_{m \in IMPG_n} \sum_{j_k \in PROD_j} T_{j_k}^{m} w_{j_k}^{m,e}}{\sum_{e \in EXPG_i} \sum_{m \in IMPG_n} \sum_{j_k \in PROD_j} w_{j_k}^{m,e}}$$

where $t_{i,j}^{n}$:tariff rate of commodity i from economy j to economy n

$T_{j_k}^{m}$:tariff rate of importer m in tariff line j_k

$w_{j_k}^{m,e}$:value of trade between importer m and exporter e

$IMPG_n$:importer group n

$EXPG_i$:exporter group i

$PROD_j$:product group j

The protection database is composed of 10 goods and services and 21 regions, 18 of which are of APEC economies,[7] evaluating IAPs, with a supplement by UNCTAD/TRAINS. Moreover, the most detailed tariff data, which consist of 50 goods and services, based on the GTAP database version 4, are available in Appendix 1 of this paper[8]. Table 2-6 reports the years of the trade and tariff information.

c. Process of Calculations

We calculate four datasets: 1) the base year case; 2) the baseline case of year 2010 (UR); 3) the controlled case of year 2010 (UR+MAPA); 4) the controlled case of year 2010 (UR+IAP98). According to the methodology of

[6] Reincke (1996).

[7] The data of Brunei Darssalam, Papua New Guinea, and Peru are not incorporated in the GTAP database Version 4.

[8] The data of Viet Nam are from GTAP Version 4 because they are not available in UNCTAD/TRAINS.

the GTAP database, two types of data are required for the protection database: bilateral trade data, and tariff data at the HS 6-digit level.

We employ trade data from UNCTAD (1997), which reports bilateral trade data on imports classified by exporting economies at the HS 6-digit level. For all five datasets, the same trade data are used since future trade data are not available at present.

In comprehensive data sources of international organizations, tariff data are reported in both UNCTAD/TRAINS and WTO/IDB. All these tariff data are regarded as measures on an MFN basis.

Tariff data are reported at the HS 6-digit level in WTO (1995), and at the HS 8-digit level in UNCTAD (1997).[9] We include 6-digit level tariff data, simply averaged from more detailed data, including 8-digit ones, of the latter two data sources, when necessary.

Tariff data must be donated on an *ad valorem* basis in the GTAP database. We unqualifiedly employ *ad valorem* duties when two types of duties, such as *ad valorem* duties and specific duties, are listed in the same tariff line in UNCTAD/TRAINS and/or WTO/IDB. In some cases, *ad valorem* duties are not available. We therefore convert specific duties into those on an *ad valorem* basis when both trade quantity data and total tariff value are reported. On the other hand, when this conversion is not applicable, we have to ignore the tariff data reported only in a specific duties form or regard them as "not available."

Generally concerning the tariff data of current and baseline cases, the data reported in UNCTAD/TRAINS are widely employed for updating the current tariff rates as the current dataset. Those reported in WTO/IDB are employed for future tariff rates as the four future datasets. They are partially utilized for filling up the missing current data from UNCTAD /TRAINS, since WTO/IDB is not comprised of all HS code items.

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[9] Some tariff data are reported at the HS 9-digit level in WTO (1995).

Apart from these calculation principles, we also pay close attention to sub-regional preferential trade agreements, such as NAFTA and CER. According to NAFTA, bilateral tariff rates on manufactured goods among Canada, Mexico, and the United States are set to zero from 2000 onward. Concerning CER, bilateral tariff rates on all goods between Australia and New Zealand are set to zero at all time points of the protection database. These treatments of the sub-regional preferential trade agreements are subject to the GTAP database Version 4.

Table 2-1: IAP98 Highlights -- Tariff Action Plans of APEC

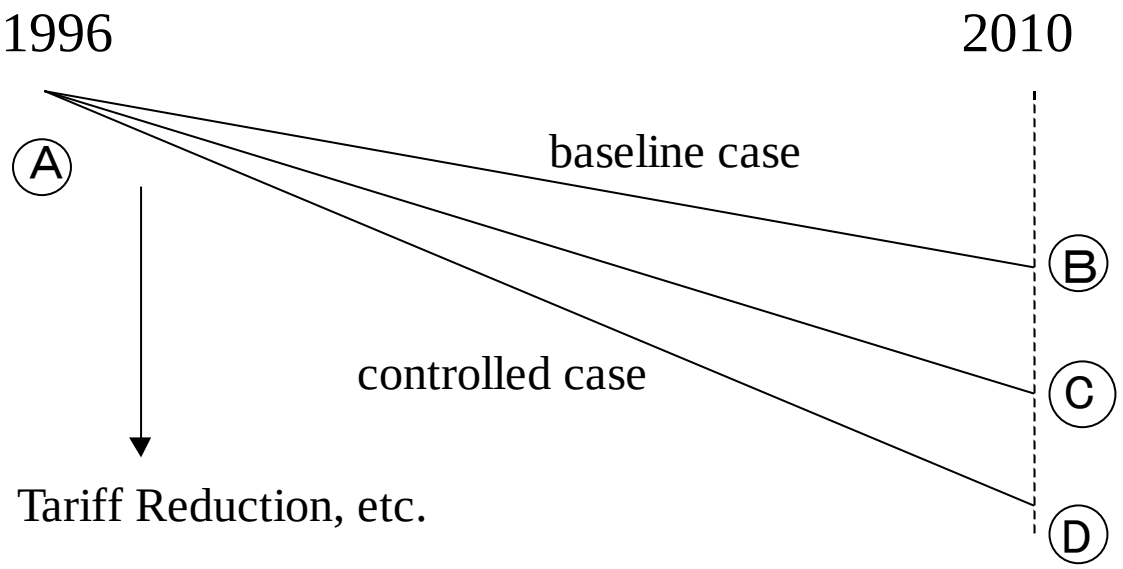
Economy	IAP Implementation and Improvements
Australia	● Reduced import tariffs on passenger motor vehicles (by 2.5%), as well as on textile, clothing and footwear (by between 1 and 3%) ● Bring forward the removal of tariffs on most Information Technology Agreement products by 18 months to 1 July 1998. ● Remove tariffs on a range of medical and scientific equipment.
Brunei	● All of the specific tariffs (87 tariff lines) will be converted to ad valorem and itemised all tariff lines at the 9-digit level.
Canada	● Tariff simplification initiative implemented on January 1, 1998, introduced several measures, including acceleration of UR reductions, to bring the average tariff under 1.1%(1997 level).
Chile	● Will reduce general applied tariff rates by 45%, from 11% to 6% across-the-board, in a five-year period, at a rate of 1 percentage point per annum, starting on January 1st, 1999.
China	● Will reduce by 2005 the average tariff rate of 5,669 manufactured commodities to 10.8%, with the weighted average rate declining to 6.6%. ● Tariffs for 185 information technology products to be eliminated by 2005, except a few of them by 2007.
Hong Kong	● Implement autonomously in 1999 the tariff elements of all sectoral proposals under EVSL, on the basis of product coverage and end rates endorsed by Trade Ministers in June 1998.
Indonesia	● Lowered a significant number of tariffs in 1998, including: ● -tariffs on all food items (reduced to a maximum of 5%) ● -tariffs on non-food agricultural products, chemical products and steel/metal products (reduced by 5 percentage points) ● -tariffs between 15-25% by five percentage points ● Will reduce tariffs on chemical, steel/metal, and fishery products to 5-10 % by the year 2003.
Japan	● Undertook tariff reductions in accordance with commitments under UR and ITA.
Korea	● In addition to its UR tariff concessions, unilaterally reduced its tariffs on 182 tariff rates lines of raw materials and intermediate/ semi-finished goods to 1-5% as of 1January 1998.
Malaysia	● Reduced tariffs on 65 tariff lines, including those committed under the WTO and ITA. Abolished duties on 12 lines. ● Will review 300 tariff lines with specific, mixed or alternative duties, for conversion into ad valorem tariffs
Mexico	● Implemented unilateral tariff reductions on, among others, certain chemicals, vehicle parts, tractors and other vehicles, and environmental machinery and equipment. ● Will review further tariff reductions, especially in the case of inputs and machinery produced in APEC economies.
New Zealand	● Removed tariffs on automobiles and light commercial vehicles from 15 May 1998. ● All imports will be duty free by 1 July 2006.

PNG	● To introduced comprehensive Tariff Reform (TRF) on 1.1.99 ● Will lower all base tariff from 8% to 5%.
Philippines	● Reduced applied tariffs bringing the simple average tariff down from 12.11% in 1997 to 9.44% in 1998.
Russia	● To improve the customs tariff taking into account the process of accession of the Russian Federation to the WTO. ● To scale down consistently the average weighted rate of import customs tariff taking into account Russia's commitments that should be accepted in WTO.
Singapore	● Singapore has bound 85% of its tariff lines at 8.0% and below as per the schedule in its IAP.
Chinese Taipei	● Has promulgated the 1996 Amendment of Customs Import Tariff Schedule in June 17, 1998 which reduces the average nominal rate of tariff from 8.64% to 8.25%. ● Have implemented temporary tariff reductions of 16 items in order to fulfill the commitment of the WTO negotiations
Thailand	● Review the possibility of revising its tariff concession schedule. ● Regularly review the level of import duties with a view to reducing domestic protection and enhancing trade liberalization.
U.S.	● From January 1, 1998, the U.S. implemented the fourth phase of tariff reductions under the Uruguay Round agreements
Viet Nam	● Reduce the current number of tariff rates from 25 to less than 15. ● Prepare for the implementation of GATT Customs Valuation Agreement.

Source : SOM Chair's Summary Report (APEC, 1998)

Figure 2-2 Images of Database Time Points and Cases[1]

	Time Point	Cases
A : Base Year	1996	---
B : UR	2010	baseline
C : UR+MAPA	2010	controlled
D : UR+IAP98	2010	controlled



[1] These figures describe the images of tariff reduction schedules and are not based on actual schedules.

Table 2-3 Tariff Elimination Schedule on the ITA

Data for tariff elimination	2000	2002	2004	2005
Economies which represent to join the ITA at SMC	Australia Canada Hong Kong Japan Singapore USA	Chinese Taipei	Korea	Indonesia
Economies which represent to join the ITA after January, 1997	New Zealand			Malaysia Philippines Thailand

Source : EPA (1998)

Table 2-4 Summary of Tariff Reduction[2]

(unit : percent point)

	Australia			Canada			Chile		
	UR	IAP96	IAP98	UR	IAP96	IAP98	UR	IAP96	IAP98
AGR	-0.0	-0.0	-0.0	-4.0	-4.0	-4.0	-2.6	-11.0	-11.0
MNG	0.0	0.0	0.0	-0.1	-0.3	-0.3	0.0	-11.0	-11.0
PFD	-0.3	-0.3	-0.3	-15.1	-15.1	-15.1	-2.6	-11.0	-11.0
TXL	-2.5	-6.7	-10.1	-3.9	-3.9	-3.9	0.0	-11.0	-11.0
CHM	-0.2	-0.3	-0.3	-1.6	-2.1	-2.1	0.0	-11.0	-11.0
MTL	-0.1	-0.1	-0.1	-2.9	-3.1	-3.1	0.0	-11.0	-11.0
TRN	-0.2	-0.4	-0.6	-1.6	-1.9	-1.9	0.0	-11.0	-11.0
OME	-0.1	-0.5	-0.5	-1.4	-2.0	-2.0	0.0	-11.0	-11.0
OMF	-0.1	-0.3	-0.4	-2.1	-2.3	-2.3	0.0	-10.2	-10.2

	China			Hong Kong			Indonesia		
	UR	IAP96	IAP98	UR	IAP96	IAP98	UR	IAP96	IAP98
AGR	0.0	-10.7	-11.7	0.0	0.0	0.0	-0.0	-0.0	-0.0
MNG	0.0	-3.3	-3.6	0.0	0.0	0.0	-0.2	-0.2	-0.2
PFD	0.0	-15.9	-17.3	0.0	0.0	0.0	-4.0	-4.0	-4.0
TXL	0.0	-11.7	-15.9	0.0	0.0	0.0	-0.0	-0.0	-0.0
CHM	0.0	-6.4	-8.6	0.0	0.0	0.0	-0.2	-0.2	-0.2
MTL	0.0	-5.5	-7.5	0.0	0.0	0.0	-0.1	-0.1	-0.1
TRN	0.0	-9.4	-12.4	0.0	0.0	0.0	-2.5	-2.5	-2.5
OME	0.0	-8.0	-11.6	0.0	0.0	0.0	-0.1	-0.9	-0.9
OMF	0.0	-13.8	-19.2	0.0	0.0	0.0	0.0	0.0	0.0

[2] Figures are denominated as a percentage point change of the future time point data from the base year data (*e.g.* when tariff rate of future time point data is 8 percent and that of base year data is 10 percent, -2 is given in the table).

(unit : percent point)

	Japan			Korea			Malaysia		
	UR	IAP96	IAP98	UR	IAP96	IAP98	UR	IAP96	IAP98
AGR	-0.8	-0.8	-0.8	-4.6	-4.6	-4.6	-7.3	-7.3	-7.3
MNG	-0.0	-0.0	-0.0	-1.0	-1.0	-1.0	-3.4	-3.4	-3.4
PFD	-1.2	-1.2	-1.2	-4.1	-4.1	-4.1	-9.6	-9.6	-9.6
TXL	-1.6	-1.6	-1.6	-0.2	-0.2	-0.2	-2.1	-2.1	-2.1
CHM	-0.6	-0.6	-0.6	-1.6	-1.6	-1.6	-4.0	-4.0	-4.0
MTL	-1.4	-1.4	-1.4	-2.1	-2.1	-2.1	-2.6	-2.6	-2.6
TRN	0.0	0.0	0.0	-0.6	-0.6	-0.7	-4.3	-4.3	-4.3
OME	-0.1	-0.1	-0.1	-1.0	-1.0	-1.7	-3.4	-3.8	-3.8
OMF	-1.2	-1.2	-1.2	-2.7	-2.7	-2.7	-5.1	-5.1	-5.1

	Mexico			New Zealand			The Philippines		
	UR	IAP96	IAP98	UR	IAP96	IAP98	UR	IAP96	IAP98
AGR	-0.1	-0.1	-0.1	-0.3	-0.9	-0.9	-0.1	-13.3	-13.3
MNG	0.0	0.0	0.0	-0.4	-0.8	-0.8	-0.1	-9.5	-9.7
PFD	-0.1	-0.1	-0.1	-0.6	-4.4	-4.4	-0.3	-15.3	-15.3
TXL	-4.8	-4.8	-4.8	-2.1	-11.6	-11.6	-0.3	-18.5	-22.4
CHM	-0.1	-0.1	-0.1	-0.4	-2.5	-2.5	-0.2	-9.0	-11.1
MTL	-0.0	-0.0	-0.0	-0.7	-4.3	-4.3	-0.0	-9.6	-13.8
TRN	-0.0	-0.0	-0.0	-0.8	-7.3	-7.3	-0.0	-5.5	-10.8
OME	-0.0	-0.0	-0.0	-0.8	-5.5	-5.5	-0.1	-8.7	-10.6
OMF	-1.1	-1.1	-1.1	-3.0	-6.9	-6.9	-0.3	-12.6	-19.2

(unit : percent point)

	Russia			Singapore			Chinese Taipei		
	UR	IAP96	IAP98	UR	IAP96	IAP98	UR	IAP96	IAP98
AGR	0.0	0.0	0.0	-0.2	-0.4	-0.4	0.0	-2.8	-3.8
MNG	0.0	0.0	0.0	0.0	-0.9	-0.9	0.0	-0.1	-0.1
PFD	0.0	0.0	0.0	-0.5	-0.9	-0.9	0.0	-5.2	-6.5
TXL	0.0	0.0	0.0	-0.0	-1.3	-1.3	0.0	-1.9	-2.5
CHM	0.0	0.0	0.0	-0.0	-0.1	-0.1	0.0	-1.0	-1.1
MTL	0.0	0.0	0.0	-0.0	-0.0	-0.0	0.0	-1.3	-1.5
TRN	0.0	0.0	0.0	-0.0	-4.3	-4.3	0.0	-2.1	-2.7
OME	0.0	0.0	0.0	-0.0	-0.0	-0.0	0.0	-1.6	-1.8
OMF	0.0	0.0	0.0	-0.1	-0.2	-0.2	0.0	-1.0	-1.1

	Thailand			The United States			Viet Nam		
	UR	IAP96	IAP98	UR	IAP96	IAP98	UR	IAP96	IAP98
AGR	-13.0	-13.0	-13.0	-1.4	-1.4	-1.4	0.0	0.0	0.0
MNG	-3.8	-3.8	-3.8	-1.1	-1.1	-1.1	0.0	0.0	0.0
PFD	-17.0	-17.0	-17.0	-4.8	-4.8	-4.8	0.0	0.0	0.0
TXL	-7.6	-7.6	-7.6	-2.3	-2.3	-2.3	0.0	0.0	0.0
CHM	-4.1	-4.1	-4.1	-1.0	-1.0	-1.0	0.0	0.0	0.0
MTL	-3.6	-3.6	-3.6	-2.1	-2.1	-2.1	0.0	0.0	0.0
TRN	-8.6	-8.6	-8.6	-0.5	-0.5	-0.5	0.0	0.0	0.0
OME	-3.2	-3.8	-3.8	-0.7	-1.0	-1.0	0.0	0.0	0.0
OMF	-8.3	-8.3	-8.3	-1.0	-1.0	-1.0	0.0	0.0	0.0

Source : The authors' calculation.

(note) Aggregation of Commodity/Industry Group

Name	Aggregation	Commodity/Industry in GTAP Model
AGR	Agriculture, Forestry and Fishery	Paddy rice, wheat, Cereal grains n.e.c., Vegetables, fruit, nuts, Oil seeds, Sugar cane, sugar beet, Plant-based fibers, Crops n.e.c., Bovine cattle, sheep and goats, horses, Animal products n.e.c., Raw milk, Wool, silk-worm cocoons, Forestry, Fishing
MNG	Mining	Coal, Oil, Gas, Minerals n.e.c.
PFD	Food and Beverages	Bovine cattle, sheep and goat, horse meat products, Meat products n.e.c., Vegetable oils and fats, Dairy products, Processed rice, Sugar, Food products n.e.c., Beverages and tobacco products
TXL	Textiles	Textiles, Wearing apparel
CHM	Chemicals	Petroleum, coal products, Chemical, rubber, plastic products, Mineral products n.e.c.
MTL	Metals	Ferrous metals, Metals n.e.c., Metal products
TRN	Transport Equipment	Motor vehicles and parts, Transport equipment n.e.c.
OME	Machinery and Equipment	Electronic equipment, Machinery and equipment n.e.c.
OMF	Other Manufacturing	Leather products, Wood products, Paper products, publishing, Manufactures n.e.c.
EGW	Electricity, Gas and Water	Electricity, Gas manufacture, distribution, Water

Source : GTAP Version 4

Table 2-5 Tariff Reduction Schedule of Beyond-UR Measures of Australia

Industry/Year	1998	1999	2000	2005
PMV and Components	20%	17.5%	15%	10%
PMV and Replacement Parts	15%	15%	15%	10%
Apparel and certain finished textiles	31%	28%	25%	17.5%
Cotton sheeting and woven fabrics	19%	17%	15%	10%
Other fabrics	19%	17%	15%	10%
Sleeping bags, table linen, tea towels	12%	11%	10%	7.5%
Footwear	21%	18%	15%	10%
Footwear parts	10%	10%	10%	7.5%
Carpets	19%	17%	15%	10%

Source : APEC (1998)

Table 2-6 Years of Trade and Tariff Information

Import Economy	Trade	Tariff
Australia	1996	1996
Canada	1996	1996
Chile	1996	1995
China	1996	1996
Hong Kong	1996	1994
Indonesia	1996	1995
Japan	1996	1996
Korea	1996	1995
Malaysia	1996	1995
Mexico	1995	1995
New Zealand	1996	1996
The Philippines	1996	1996
Russian Federation	1996	1997
Singapore	1996	1996
Chinese Taipei	1996	1996
Thailand	1995	1995
The United States	1996	1996
Viet Nam	1995	N.A.

Source:1) trade data from UNCTAD (1997); 2) tariff data from UNCTAD (1997) and UNCTAD (1996); 3) the data of Viet Nam from GTAP Version 4

Chapter 3 Model Building[1]

3. 1 Introduction of GTAP

The Global Trade Analysis Project (GTAP) was established in 1992, with the objective of lowering the cost of entry for those seeking to conduct quantitative analyses of international economic issues in an economy-wide framework. The GTAP database combines detailed bilateral trade, transport, and protection data characterizing economic linkages among regions, together with individual country input-output (I/O) databases that account for intersectoral linkages within regions. The Project consists of several components:

— a fully documented, publicly available, global database
— a standard general equilibrium modeling framework
— software for manipulating the data and implementing the standard model
— a global network with a common interest of multi-region trade analysis and related issues
— a consortium of national and international agencies providing leadership and a base level of support for the Project, and
— a Web site for dissemination of data, software and Project-related information.

The components of this multi-region, applied general equilibrium model are relatively standard. However, it does have distinguishing features: the treatment of private household behavior, international trade and transport activity, and global savings/investment relationships. Also, a significant number of auxiliary variables have been introduced to facilitate a variety of alternative closures.[2]

The GTAP database is regularly updated. The latest version is Version 4, which was released in December 1998. The main differences between Versions 3 and 4 are the following:

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[1] This chapter is based on EPA (1997).

[2] Hertel (1997).

1) The new base year for the database is 1995 (it was 1992 in Version 3).
2) Version 4 database expands its sectoral classification to 50 sectors, from 37 sectors in Version 3.
3) Version 4 database expands its regional coverage to 45 regions, from 30 regions in Version 3.
4) Considerable numbers of regional input-output tables are updated.

3.2. Model Building – Aggregation

As we mentioned in the previous section, the GTAP Version 4 database has 45 regional classifications and 50 industrial classifications. The size is usually too big to calculate or analyze. An aggregated version of the database will be desired for GTAP simulations. We have to build a suitable aggregated database for our analysis.

The region was aggregated incorporating four concerns: i) aggregation of the non-APEC economies where appropriate, ii) sub-regional arrangements in the APEC region, iii) disaggregation of the APEC member economies which produces meaningful results, and iv) sequence to the first report submitted in 1997.

From the viewpoint of modeling, it should be noted that differences in the economic structures are measured in key parameters in the model. However, substitution elasticities, both in value-added and in sources of origin, are common among the regions in the current model based on sufficient evidence and reason. Moreover, income and price elasticities of demand vary across economies, but only marginally so.

However, the APEC member economies will primarily be concerned with the effects on their own individual economies. Moreover, the economic effects--according to the main discriminatory features in the IAP measures among the economies--should be key interests.

Taking into account those interests of participants, regions are aggregated into 21 areas, and 18 areas are allocated to APEC economies.

The APEC member economies are disaggregated individually where data are available. But we should re-examine regional aggregation from the viewpoint of sequence between the GTAP database Version 3 and Version 4 of the GTAP databese.[3]

As for commodity classification in Version 4 database, agriculture or agricultural products are divided more in detail, "Motor vehicles and parts" is separated from "Transport equipment," "Electronic equipment" is separated from "Machinery and equipment" and "Electricity," and "Gas" and "Water" are separated. These revisions enable to make a strategic aggregation focusing on key sectors and regional interest. However, in this paper, 14 commodities are aggregated following a standard classification in the national accounts, considering the importance of industries in the economy as a whole and the sequence to the previous study.

(Table 3-1 : Regional and Commodity Aggregation)

3.3. Model Building – Key Assumptions

Changes in trade and output are sensitive to the key economic assumptions in the model. First of all, the theoretical background of the assumptions will be surveyed, highlighting available usage and modifications in this section. Quantitative evaluation of those assumptions is also given by model simulations.

a. Impact of Induced Savings and Investment

The more efficient utilization of productive resources followed by trade liberalization will lead to an increase in GDP. However, it is well known that the projection of static efficiency effects tends to be relatively small as a percentage change of GDP because of the fixed capital stock in the standard static model. One shortcoming of the standard static model is that it fails to account for the positive relationship between trade, investment, and

[3] See Chapter 4.

growth.

Francois, McDonald, and Nordstrom (1996) explore the interaction between trade policy and capital accumulation in the GTAP model.[4] According to the growth theory, a medium-run growth or accumulation effect induces additional savings and investment, which yields more output. In general, a permanent shock to the GDP is translated into a shock to the steady state level of capital. The magnitude of this effect crucially depends on the assumed underlying saving behavior. Under the assumption of a fixed saving ratio, the change in steady states capital stock is proportionate to the change in the steady states level of GDP.

In contrast, with endogenous saving--which is determined by the condition that the opportunity cost of postponed consumption should equal the net marginal return of capital--the medium-run impact can differ quite substantially from the static impact.[5] They point out that the traditional focus on static effects was potentially misleading, and that more attention needs to be given to savings behavior in the assessment of trade policy reform.

b. Capital Movement

The assumption of flexible capital movements across regions would enable the trade balance to change as a result of implementation of trade

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[4] In the GTAP model, the capital accumulation effect can be estimated by adding the following equation:

EXPAND(Capital, r) = qcgds(r) – qo(Capital, r) ,

where qcgds(r) is quantity change of investment in region r, and qo(Capital,r) is quantity change of capital stock in region r. EXPAND is exogenous. qcgds and qo are endogenous.

[5] In the GTAP model, endogenous saving ratio can be estimated by adding the following equation:

REAL_RET(r) = [rorc(r)] – [yp(r) – up(r)] ,

where rorc(r) is change of current net rate of return on capital stock in region r, yp(r) is change of private household expenditure in region r, and up(r) is change of per capita utility from private household expenditure in region r. REAL_RET is exogenous. rorc, yp and up are endogenous.

liberalization measures, while the trade surplus (deficit) is balanced by capital outflows (inflows). Estimated changes in exports in certain economies may be different from those in imports.

c. Trade Facilitation

The objective of trade facilitation measures is to reduce the cost of doing business by liberalizing trade, eliminating unnecessary administrative burdens, and bringing down technical barriers to trade through the use of new technologies and/or cost-effective processes. Table 3-2 summarizes the limited references on empirical estimates of the impact of trade facilitation: the Cecchini Study on intra-EC trade facilitation; the UNCTAD study; and a study by the Australian Industry Commission (IC95).

Based on the above, it appears that the range of two to three percent of total import value is a consensus of the potential direct cost savings from various trade facilitation measures. Our previous study used one percent of import prices for the direct cost savings from trade facilitation for the newly industrializing economies of Korea, Chinese Taipei and Singapore, and two percent for the other developing economies.[6] These estimates were on the conservative side, in the range of about half the consensus estimates. This conservative approach is prudent when the wide variety of APEC members is taken into account.

[6] EPA(1997)

Table 3-1 : Regional and Commodity Aggregation

Economies/Regions

I.a. AGGREGATION	(NAME)	IN GTAP Model
1. AUSTRALIA	(AUS)	Australia
2. NEW ZEALAND	(NZL)	New Zealand
3. JAPAN	(JPN)	Japan
4. INDONESIA	(IDN)	Indonesia
5. MALAYSIA	(MYS)	Malaysia
6. PHILIPPINES	(PHL)	Philippines
7. THAILAND	(THA)	Thailand
8. CHINA	(CHN)	China
9. KOREA	(KOR)	Korea
10.SINGAPORE	(SGP)	Singapore
11.Hong Kong	(HKG)	Hong Kong
12.CHINESE TAIPEI	(TWN)	Chinese Taipei
13.UNETED STATES OF AMERICA	(USA)	United States of America
14.CANADA	(CAN)	Canada
15.MEXICO	(MEX)	Mexico
16.CHILE	(CHL)	Chile
17.VIET NAM	(VNM)	Viet Nam
18.RUSSIAN FEDERATION	(RUS)	Former Soviet Union
19.LATIN AMERICA	(LTN)	Central America and Caribbean, Venezuela, Colombia, Rest of the Andean Pact, Argentina, Brazil, Uruguay, Rest of South America
20.WESTERN EUROPE	(WEU)	United Kingdom, Germany, Denmark, Sweden, Finland, Rest of European Union, European Free Trade Area
21.REST OF THE WORLD	(ROW)	India, Sri Lanka, Rest of South Asia, Central European Associates, Turkey, Rest of Middle East, Morocco, Rest of North Africa, South African Union, Rest of Southern Africa, Rest of Sub Saharan Africa, Rest of World

Note : Brunei, Papua New Guinea and Peru are not included in the GTAP database.

Commodities/Industories

AGGREGATION	(NAME)	IN GTAP Model
1. AGRICULTURE, FORESTRY & FISHERY	(AGR)	Paddy rice, wheat, Cereal grains n.e.c., Vegetables, fruit, nuts, Oil seeds, Sugar cane, sugar beet, Plant-based fibers, Crops n.e.c., Bovine cattle, sheep and goats, horses, Animal products n.e.c., Raw milk, Wool, silk-worm cocoons, Forestry, Fishing
2. MINING	(MNG)	Coal, Oil, Gas, Minerals n.e.c.
3. FOOD & BEVERAGES	(PFD)	Bovine cattle, sheep and goat, horse meat products, Meat products n.e.c., Vegetable oils and fats, Dairy products, Processed rice, Sugar, Food products n.e.c., Beverages and tobacco products
4. TEXTILES	(TXL)	Textiles, Wearing apparel
5. CHEMICALS	(CHM)	Petroleum, coal products, Chemical, rubber, plastic products, Mineral products n.e.c.
6. METALS	(MTL)	Ferrous metals, Metals n.e.c., Metal products
7. TRANSPORT EQUIPMENT	(TRN)	Motor vehicles and parts, Transport equipment n.e.c.
8. MACHINERY & EQUIPMENT	(OME)	Electronic equipment, Machinery and equipment n.e.c.
9. OTHER MANUFACTURING	(OMF)	Leather products, Wood products, Paper products, publishing, Manufactures n.e.c.
10.ELECTRICITY, GAS & WATER	(EGW)	Electricity, Gas manufacture, distribution, Water
11. CONSTRUCTION	(CNS)	Construction
12. TRADE & TRANSPORT	(T_T)	Trade, transport
13. OTHER SERVICES(PRIV.)	(OSP)	Financial, business, recreation services, Dwellings
14. OTHER SERVICES(GOVT.)	(OSG)	Public admin and defense, education, health service

Table 3-2: Reference Summary of Cost Savings from Trade Facilitation

Source	Scope	Impact	Note
Commission of the European Communities "Cecchini Report" and other related studies (1988)	Intra-EC Trade Customs Procedures	1.6-1.7% of total intra-EC trade value for administrative costs to firms. (approximately 5% if lost business opportunities are included.)	Surveyed by extensive interviews of firms in the area.
	Removing barriers affecting overall production (protective public procurement, divergent technical standards and other restrictions)	2.0-2.4% of GDP in the area	Assessed by welfare gain approach
UNCTAD "Columbus Ministerial Declaration on Trade Efficiency" (1994)	Trade Efficiency Measures: · Banking and Insurance · Customs · Business Information · Transport · Telecommunication	Costs of trade transactions are 7-10% of the total trade value. Trade efficiency measures would result in the reduction of the costs above by 25% or by up to US$100 billion annually by 2000. This means cost saving of 2-3% of prices of arrived goods.	Recommended measures are largely comparable to Osaka Action Agenda.
Australia Industry Commission "The Impact of APEC's Free Trade Commitment" (IC95) (1995)	Facilitation measures in the Osaka Action Agenda · Direct cost savings from administration and delays associated with customs controls and some limited action on facilitation · Direct cost savings from above plus a more extensive set of facilitation measures.	5% of total trade value 10% of total trade value	The figures are used for inputs of CGE model.

(Source) APEC (1997)

Chapter 4 Simulations

4. 1 Comparison of Version 3 and Version 4

The database Version 3 of GTAP was used in the previous report, "the Impact of Trade Liberalization in APEC" in 1997.[1] In our current study, Version 4 is used. Because the new simulation in our current study must be in harmony with that of the previous report, we must compare the results coming from both databases. In the previous report, the aim of our analysis was to estimate the effect of the Manila Action Plan (MAPA). The shock we give to the simulation in this section is the same as that of the previous report.

The first simulation is the standard case that includes neither the capital accumulation effect, capital movement effect, nor the economic scale effect. Table 4-1 shows the results of the comparison. In this simulation, the major effect is trade expansion by price effect due to tariff reduction in APEC economies. There is little difference between the two simulations. As for impact on APEC economies, the change of export volume would be 2.14% in Version 3 and 2.07% in Version 4, and the change of real income 0.07% in Version 3 and 0.06% in Version 4.

The next simulation includes the capital accumulation effect as well as tariff reduction effect. Case 0 of Table 4-2 shows the results by using the original Version 4 database. As for impact on APEC economies, there is little difference between the two simulations. The change of export volume would be 2.99% in Version 3 and 2.63% in Version 4, and the change of real income 0.39% in Version 3 and 0.27% in Version 4. Breaking down the impact of MAPA into each APEC economy, some would be different between the two simulations. In the simulation using database Version 3, all the members of APEC would gain positive GDP growth by MAPA, but the GDP of Hong Kong and Mexico would be negative in the simulation using database Version 4, while the others would be positive. Taking the capital accumulation effect into account, a balance between flow data and stock

[1] APEC (1997).

data in the database is important for stable simulation.

The original dataset of Hong Kong in Version 4 includes a negative savings rate that perhaps reflects an underestimate of re-exports or investment and an overestimate of consumption.[2] In the previous report, consumption had been moved to investment. It may be also necessary to amend the database in this study.

The database of Mexico in Version 4 has two problems. One is the reference year of GTAP database, 1995, when the currency crisis in Mexico occurred and the economy was in a slump. The ratio of investment to GDP in Mexico was 20.9% in Version 3 but it dropped to 14.1% in Version 4. There may be an imbalance between flow data and stock data in Mexico. The other problem is that the database introduced NAFTA's trade structure. Protection data of Version 4 among NAFTA members is set at zero. The ration of exports to GDP in Mexico increased from 18.6% in Version 3 to 31.3% in Version 4.

In this section, we try to change the database of Hong Kong so as to make savings, investment, and consumption well balanced.[3] To amend the distortion of the Mexican database, the saving rate only in Mexico is endogenous (Case 1).[4] We have tried to change the regional aggregation of NAFTA members into a single region (Case 2). The change of real income in Hong Kong would be positive; 0.15% in Case 1 and 0.07% in Case 2. The change of real income in Mexico would be also positive; 1.05% in Case 1. The impact on the other regions would hardly be affected by these amendments of database or model closure.

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[2] Hong Kong's savings rate to GDP is minus 10% in Version 4. However, the actual savings rate to GDP was 30.5% in 1995 according to the Hong Kong Statistical Bureau.

[3] We move consumption to investment until the rate would be plus 10% to GDP as a minimum amendment.

[4] In the closure of endogenous savings rate, real return to capital goods and the price of the current composite consumption goods should be determined equally. [rorc(r) = yp(r) – up(r)]
When savings rates in all regions are endogenous, simulation results are very unstable.

4. 2 The Economic Impact of Trade Liberalization in APEC

To clarify the relative significance of key assumptions in the model discussed in the former chapter, simulations were carried out for reducing protection according to the scenarios of trade liberalization in APEC. We prepared three scenarios of trade liberalization for the simulation: 1) Uruguay Round (UR), 2) UR and MAPA (UR+MAPA), 3) UR, MAPA and the latest IAP (UR+IAP98).

Based on the standard model below, properties of individual key assumptions were simulated by introducing them one by one into a model while not modifying the other parts of the model. Those assumptions are compared in Table 4-3.

(Table 4-3 : Assumptions)

a. Standard Model (STD)

A standard simulation is carried out using the GTAP database Version 4 without modifying any parameters or model specifications. First, capital movements are not flexible to changes in rate of return, and trade balances are fixed. Second, a "dynamic" income effect (accumulation of capital stock) is not assumed. Third, perfect competition--therefore constant return to scale--is assumed, while imperfect substitution in goods and services between home and abroad and those among different origins of economies are assumed by Armington parameters, as currently incorporated in the database. Effects on trade (exports) and output are shown in Tables 4-6 and 4-7 both by regions and by industries.

(Table 4-4 : Effects on Export in STD model)
(Table 4-5 : Effects on Output in STD model)

The estimated export volumes and income gains are different among the APEC economies. Differences reflect the following factors: i) *The relative magnitudes of the economies* (the larger the economy, the larger the

absolute dollar gain); ii) *The degree of liberalization undertaken* (economies that liberalize the most gain the most); iii) *The expected interactions of domestic and foreign economies*. In some cases, the liberalization of one economy would involve a reduction of the income in other economies, because the liberalization of an economy might cause a deterioration in the terms of trade of other economies. [5]

b. Capital Movement (CM)

Full flexibility in international capital movement is assumed in the model, setting the parameter of RORDELTA equal to one. If RORDELTA equals one, changes in expected return on capital across regions are equalized. In other words, international capital movements are allowed in the model. Trade balance is also endogenous, a "dynamic" income effect (accumulation of capital stock) is not assumed, and constant return to scale is assumed.

(Table 4-6 : Effects on Export in CM model)
(Table 4-7 : Effects on Output in CM model)

As concerns trade expansion, differences emerge when they are looked at either by industries or by regions, although the size of world trade expansion as a whole is not affected. Nor is trade expansion by commodities affected by incorporation of flexible capital movement. However, capital movement would enable trade balances to change across regions, a feature fixed in the standard model.

c. Capital Accumulation (CA)

In the CA model, capital formation is linked to changes in income. The fixed ratio of initial increases in income will be saved and invested. Capital stock would increase and derive a further increase in output, and

[5] APEC (1997).

therefore income. Trade balance as well as capital flows are fixed. Constant return to scale is assumed. Adding these income effects to capital formation, output expands compared with the model simulation, which does not assume it. The savings rate of Mexico is endogenous in CA1 model. Canada, Mexico, and the United States are aggregated into NAFTA in CA2 model.

(Table 4-8 : Effects on Export in CA1 model)
(Table 4-9 : Effects on Output in CA1 model)
(Table 4-10 : Effects on Export in CA2 model)
(Table 4-11 : Effects on Output in CA2 model)

The estimated income gains are more different among the APEC economies than the results in STD model. Differences reflect the degree of capital deepening caused by the policy shocks as well as the three factors mentioned in STD model. The CA model tends to magnify the income effects more so when the tariff reduction and trade facilitation are capital friendly, i.e. the measures shift the economy toward more capital intensive production, and when the savings rates are higher. Generally, the developing economies display these conditions.[6]

Although the model closure or regional aggregation is changed and the database of Hong Kong are amended in CA1 and CA2, the effects of this amendment to APEC economies except NAFTA or Hong Kong are very small.

4.3 Conclusion

This study estimates the impact of trade liberalization in APEC based on the method of calculating which the previous study had done by.[7] The major shocks are; import price decline by tariff reduction by IAPs, decline of import prices for the direct cost saving from trade facilitation.

The trade liberalization measures in the MAPA/IAP are not limited to tariff reductions, which were quantified and interpreted into changes in

[6] APEC (1997).

[7] EPA (1997) and EPA (1998).

the exogenous variables in the model. These savings and investment effects will be important for economic development and growth, particularly over the medium and long term. In this paper, we tried to measure such effects as capital movement and capital accumulation by changing model closures.

However, several uncertainties and remarks in the studies by the current model, which comprehensively analyzes the economic aspects of trade liberalization measures given in the IAP, are evident. Estimated economic effects may vary due to such factors, and are more likely to be underestimated. For example, economic effects depend on the initial trade barriers and on the degree of liberalization. Trade liberalization measures as a whole, which will take place in the coming years, are not limited to implementation of the IAP measures. The model solves the net result of all direct and indirect effects that follow major trade liberalization measures in the IAP. However, the amount of detail that can be built into the model is limited.

Moreover, there could be certain limitations in the current model as a tool to evaluate the economic effects by trade liberalization measures. For example, since GTAP is largely concerned with international trade data, there are some contradictions among macroeconomic data, such as savings in Hong Kong. And the database reflects the structure of the base year.

Taking these factors into consideration, we conclude the findings of our study as follows:

First, the GTAP database Version 4 includes a change of structure from Version 3's base year. Even if the same shocks are given, the results of simulation using Version 4 would be different from those of Version 3, especially in NAFTA area. But the effects of measures beyond the Uruguay Round are almost identical.

Second, Russia and Vietnam, which have newly joined APEC in 1998, would also gain positive effects on real income through the trade liberalization of APEC.

Third, the effects of the updated IAPs would generally be larger than those of the MAPA. This means measures taken for trade liberalization in APEC are progressing gradually.

Table 4-1 Comparison of GTAP databases (Standard model)

Estimated change in Merchandise Export Volume and Real Income

(1) Impact on APEC

	Export		Real Income	
	Ver3	Ver4	Ver3	Ver4
UR Commitment	8.6	7.28	0.25	−0.03
MAPA Total	2.14	2.07	0.07	0.06
UR and MAPA	10.7	9.34	0.3	0.04

(2) Impact on WORLD

	Export		Real Income	
	Ver3	Ver4	Ver3	Ver4
UR Commitment	6.7	4.34	0.2	0.01
MAPA Total	1.38	0.96	0.04	0.04
UR and MAPA	8.0	5.30	0.3	0.05

(3) Impact on Each Economy

	Export		Real Income	
	Ver3	Ver4	Ver3	Ver4
AUS	1.62	0.98	0.11	0.03
NZL	3.17	3.66	0.28	0.09
JPN	0.90	0.82	0.02	0.01
IDN	1.12	0.63	0.11	0.04
MYS	1.89	1.44	0.48	0.49
PHL	17.63	16.47	1.27	1.68
THA	1.81	1.24	0.34	0.15
CHN	8.07	8.49	0.82	0.74
KOR	2.18	0.82	0.19	0.08
SGP	2.49	2.10	−0.07	−0.05
HKG	1.04	0.78	−0.02	−0.01
TWN	2.76	2.38	0.14	0.15
USA	1.69	1.43	0.01	0.01
CAN	1.40	1.01	0.04	0.04
MEX	1.82	0.73	0.05	0.01
CHL	6.98	9.40	0.37	0.21
LTN	0.56	0.23	0.01	0.01
WEU	0.59	0.07	0.00	0.00
ROW	0.41	0.11	0.01	0.01

(Note) Figures are the effect beyond UR, i.e. the difference between “UR+MAPA” and “UR”.

Russia and Viet Nam were not disaggregated in the previous report.

(4) Impact on Each Industry / Commodity in the world

	Export Volume		Production	
	Ver3	Ver4	Ver3	Ver4
AGR	1.00	1.30	0.00	0.03
MNG	0.68	0.74	0.03	0.06
PFD	0.97	1.34	0.01	0.03
TXL	3.49	3.10	−0.11	0.05
CHM	1.39	1.19	0.05	0.08
MTL	2.01	1.67	0.06	0.07
TRN	2.09	1.91	0.09	0.07
OME	1.85	1.75	0.14	0.20
OMF	1.54	1.62	0.03	0.07
EGW	−0.35	0.10	0.02	0.03
CNS	0.06	0.16	0.12	0.13
T_T	0.02	−2.67	−0.12	−0.18
OSP	0.07	0.12	0.03	0.03
OSG	0.50	0.22	0.03	0.04

(Note) Figures are the effect beyond UR, i.e. the difference between “UR+MAPA” and “UR”.

Table 4-2 Comparison of GTAP databases (CA model)

(1) Impact on APEC

	Export				Real Income			
	Ver3	Ver4			Ver3	Ver4		
		Case0	Case1	Case2		Case0	Case1	Case2
UR Commitment	9.1	8.69	8.29	7.76	0.9	0.96	0.77	0.64
MAPA Total	2.99	2.63	2.97	3.38	0.39	0.27	0.42	0.41
UR and MAPA	12.1	11.32	11.25	11.14	1.3	1.23	1.18	1.05

(2) Impact on WORLD

	Export				Real Income			
	Ver3	Ver4			Ver3	Ver4		
		Case0	Case1	Case2		Case0	Case1	Case2
UR Commitment	7.3	5.06	4.89	4.68	0.8	0.64	0.53	0.48
MAPA Total	1.84	1.23	1.38	1.56	0.22	0.17	0.25	0.24
UR and MAPA	9.1	6.30	6.27	6.24	1.0	0.80	0.77	0.72

(3) Impact on Each Economy

	Export				Real Income			
	Ver3	Ver4			Ver3	Ver4		
		Case0	Case1	Case2		Case0	Case1	Case2
AUS	2.01	1.33	1.33	1.74	0.39	0.27	0.27	0.29
NZL	4.23	4.70	4.72	4.59	1.31	1.14	1.16	1.06
JPN	1.07	1.03	1.03	1.20	0.14	0.13	0.13	0.13
IDN	3.71	1.74	1.75	1.60	2.44	1.07	1.08	0.96
MYS	8.87	6.43	6.46	6.06	7.37	5.16	5.18	4.60
PHL	22.11	19.57	19.58	23.90	4.27	3.83	3.82	4.43
THA	5.06	3.90	3.92	3.88	3.11	2.45	2.46	2.38
CHN	9.55	10.27	10.28	13.73	2.07	2.60	2.61	2.78
KOR	2.97	1.43	1.43	2.91	0.84	0.57	0.57	0.77
SGP	4.38	4.06	4.10	4.15	1.46	1.67	1.69	1.67
HKG	1.59	0.45	1.16	1.41	0.42	−0.40	0.15	0.07
TWN	3.85	3.82	3.83	4.25	1.25	1.73	1.73	1.89
USA	1.93	1.47	1.70	NAFTA	0.12	0.09	0.10	NAFTA
CAN	1.74	1.65	1.57	1.53	0.35	0.78	0.74	0.13
MEX	2.62	−5.84	1.58		0.69	−7.14	1.05	
CHL	11.95	12.95	13.01	12.44	4.93	3.33	3.38	3.10
LTN	0.59	0.25	0.29	0.28	0.01	0.01	0.03	0.02
WEU	0.65	0.12	0.12	0.13	0.03	0.03	0.03	0.03
ROW	0.38	0.20	0.19	0.10	−0.01	0.06	0.06	0.07

(Note) Figures are the effect beyond UR, i.e. the difference between “UR+MAPA” and “UR”.

Russia and Viet Nam were not disaggregated in the previous report.

(4) Impact on Each Industry / Commodity in the world

	Export Volume				Production			
	Ver3	Ver4			Ver3	Ver4		
		Case0	Case1	Case2		Case0	Case1	Case2
AGR	1.22	1.61	1.62	1.63	0.21	0.20	0.27	0.26
MNG	1.07	0.92	1.09	1.02	0.21	0.30	0.47	0.40
PFD	1.21	1.49	1.53	1.58	0.13	0.10	0.16	0.15
TXL	4.00	3.35	3.44	4.17	0.09	0.20	0.27	0.26
CHM	1.85	1.45	1.57	1.64	0.31	0.25	0.37	0.34
MTL	2.67	2.04	2.19	2.31	0.32	0.33	0.42	0.40
TRN	2.49	2.04	2.29	2.23	0.33	0.25	0.34	0.29
OME	2.52	2.20	2.41	2.80	0.45	0.53	0.62	0.61
OMF	1.95	1.90	2.03	2.36	0.22	0.21	0.30	0.27
EGW	−0.25	0.37	0.43	0.38	0.20	0.22	0.27	0.23
CNS	0.30	0.18	0.46	0.39	0.40	0.40	0.46	0.46
T_T	0.28	−2.53	−2.39	−2.30	0.06	−0.08	0.04	0.04
OSP	0.41	0.36	0.42	0.38	0.19	0.14	0.18	0.18
OSG	1.57	0.53	0.54	0.54	0.11	0.11	0.14	0.15

(Note) Figures are the effect beyond UR, i.e. the difference between “UR+MAPA” and “UR”.

Table 4-3 Assumptions

Simulation	Trade Balance	Capital Accumulation	Scale	Saving rate	Data of Hong Kong	Regional Aggregation
Standard Model (STD)	Fixed	Fixed	CRTS	Exogenous	Standard	Normal
Capital Movement (CM)	Endoge-n ous	Fixed	CRTS	Exogenous	Standard	Normal
Capital Accumulation (CA1)	Fixed	Endogenous	CRTS	Endogenous Mexico	Adjusted	Normal
Capital Accumulation (CA2)	Fixed	Endogenous	CRTS	Exogenous	Adjusted	NAFTA

Table 4-4 Estimated Change in Export Volume (STD model)

(1) Impact on APEC and WORLD

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
Impact on APEC	7.03	9.00	9.44	1.97	2.41
Impact on WORLD	4.77	5.72	5.92	0.95	1.15

(2) Impact on Each Economy

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
AUS	0.81	1.70	2.26	0.89	1.45
NZL	2.55	6.16	6.15	3.61	3.59
JPN	7.33	8.14	8.24	0.81	0.91
IDN	0.17	0.77	0.77	0.60	0.60
MYS	8.20	9.44	9.46	1.24	1.26
PHL	−0.29	16.09	19.57	16.39	19.86
THA	4.01	5.25	5.27	1.24	1.26
CHN	2.97	11.39	14.65	8.42	11.69
KOR	2.56	3.36	4.57	0.80	2.02
SGP	−0.21	1.87	1.94	2.08	2.15
HKG	3.17	3.95	4.25	0.77	1.07
TWN	−0.25	2.12	2.39	2.36	2.64
USA	16.04	17.44	17.49	1.40	1.45
CAN	3.34	4.34	4.34	1.00	1.00
MEX	−0.31	0.50	0.48	0.81	0.80
CHL	1.02	10.77	10.78	9.75	9.75
VNM	1.07	1.03	0.99	−0.04	−0.08
RUS	2.80	3.07	3.04	0.27	0.25
LTN	5.23	5.44	5.47	0.21	0.23
WEU	1.36	1.44	1.44	0.08	0.08
ROW	9.13	9.18	9.19	0.05	0.07

(3) Impact on Each Industry / Commodity in the world

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
AGR	3.80	5.14	5.18	1.34	1.38
MNG	1.40	2.00	2.03	0.60	0.63
PFD	6.35	7.80	7.86	1.45	1.51
TXL	8.14	11.25	11.94	3.11	3.80
CHM	5.21	6.40	6.51	1.20	1.30
MTL	4.37	6.02	6.18	1.65	1.81
TRN	2.74	4.64	4.77	1.90	2.03
OME	7.68	9.42	9.81	1.74	2.13
OMF	3.24	4.86	5.17	1.62	1.93
EGW	−0.46	−0.39	−0.33	0.06	0.12
CNS	1.86	2.03	2.00	0.17	0.14
T_T	3.08	0.36	0.39	−2.72	−2.69
OSP	2.47	2.59	2.59	0.12	0.12
OSG	0.66	0.89	0.90	0.22	0.24

Table 4-5 Estimated Change in Real Income (STD model)

(1) Impact on APEC and WORLD

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
Impact on APEC	−0.03	0.03	0.04	0.06	0.07
Impact on WORLD	0.04	0.08	0.08	0.04	0.05

(2) Impact on Each Economy

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
AUS	0.02	0.05	0.06	0.03	0.04
NZL	0.66	0.75	0.75	0.09	0.09
JPN	0.04	0.05	0.05	0.01	0.01
IDN	−0.01	0.02	0.02	0.04	0.03
MYS	1.54	1.99	2.00	0.45	0.46
PHL	0.20	1.86	2.10	1.67	1.90
THA	0.53	0.68	0.68	0.15	0.15
CHN	0.62	1.37	1.57	0.75	0.95
KOR	0.06	0.14	0.17	0.08	0.11
SGP	0.19	0.15	0.15	−0.04	−0.04
HKG	0.81	0.80	0.78	−0.01	−0.02
TWN	0.01	0.16	0.19	0.15	0.18
USA	−0.22	−0.21	−0.21	0.01	0.01
CAN	−0.04	0.00	0.00	0.04	0.04
MEX	−0.10	−0.08	−0.08	0.02	0.02
CHL	0.13	0.37	0.37	0.24	0.24
VNM	0.09	0.24	0.24	0.16	0.15
RUS	0.06	0.08	0.08	0.02	0.02
LTN	0.18	0.19	0.19	0.01	0.01
WEU	0.05	0.05	0.06	0.00	0.00
ROW	0.40	0.41	0.41	0.01	0.02

(3) Impact on Each Industry / Commodity in the world

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
AGR	0.07	0.11	0.10	0.04	0.03
MNG	0.02	0.07	0.07	0.05	0.05
PFD	−0.06	−0.03	−0.04	0.03	0.03
TXL	0.26	0.31	0.30	0.05	0.04
CHM	−0.04	0.04	0.04	0.08	0.08
MTL	0.23	0.30	0.29	0.07	0.06
TRN	0.69	0.76	0.75	0.07	0.06
OME	0.50	0.70	0.71	0.20	0.20
OMF	−0.03	0.04	0.03	0.07	0.06
EGW	−0.06	−0.04	−0.04	0.03	0.02
CNS	0.26	0.39	0.41	0.13	0.15
T_T	0.06	−0.12	−0.11	−0.18	−0.18
OSP	−0.09	−0.06	−0.06	0.03	0.03
OSG	−0.29	−0.25	−0.25	0.04	0.03

Table 4-6 Estimated Change in Export Volume (CM model)

(1) Impact on APEC and WORLD

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
Impact on APEC	7.07	8.84	9.23	1.76	2.16
Impact on WORLD	4.85	5.81	6.01	0.96	1.16

(2) Impact on Each Economy

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
AUS	1.63	1.90	2.37	0.26	0.74
NZL	2.68	5.05	5.05	2.37	2.38
JPN	7.45	8.53	8.72	1.09	1.28
IDN	1.18	1.70	1.73	0.52	0.55
MYS	6.72	7.87	7.90	1.16	1.19
PHL	−0.67	10.40	12.81	11.06	13.47
THA	4.03	5.09	5.12	1.06	1.08
CHN	4.83	12.38	15.16	7.55	10.33
KOR	2.75	3.49	4.34	0.74	1.59
SGP	−0.25	1.52	1.59	1.77	1.84
HKG	2.72	2.67	2.85	−0.05	0.13
TWN	0.06	2.23	2.52	2.18	2.46
USA	15.38	16.70	16.80	1.32	1.41
CAN	3.20	4.05	4.08	0.85	0.88
MEX	0.69	1.20	1.22	0.51	0.53
CHL	1.25	8.32	8.35	7.07	7.09
VNM	1.10	0.77	0.72	−0.33	−0.38
RUS	3.58	4.07	4.11	0.50	0.53
LTN	5.71	6.19	6.27	0.48	0.57
WEU	1.95	2.24	2.27	0.28	0.32
ROW	6.84	7.08	7.12	0.24	0.28

(3) Impact on Each Industry / Commodity in the world

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
AGR	3.84	5.19	5.24	1.34	1.39
MNG	1.40	2.05	2.07	0.64	0.67
PFD	6.44	7.86	7.92	1.42	1.48
TXL	8.20	11.21	11.85	3.01	3.65
CHM	5.29	6.51	6.62	1.22	1.33
MTL	4.42	6.09	6.25	1.67	1.83
TRN	2.95	4.90	5.03	1.96	2.09
OME	7.77	9.59	9.99	1.82	2.22
OMF	3.33	4.89	5.18	1.57	1.85
EGW	−0.35	−0.28	−0.22	0.06	0.12
CNS	1.79	1.94	1.91	0.16	0.12
T_T	3.12	0.38	0.41	−2.74	−2.71
OSP	2.50	2.63	2.64	0.14	0.14
OSG	0.65	0.87	0.89	0.22	0.24

Table 4-7 Estimated Change in Real Income (CM model)

(1) Impact on APEC and WORLD

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
Impact on APEC	−0.03	0.03	0.05	0.07	0.08
Impact on WORLD	0.04	0.08	0.09	0.04	0.05

(2) Impact on Each Economy

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
AUS	0.01	0.05	0.06	0.05	0.05
NZL	0.66	0.79	0.79	0.13	0.13
JPN	0.04	0.05	0.05	0.01	0.01
IDN	−0.02	0.02	0.02	0.04	0.04
MYS	1.54	1.98	1.99	0.44	0.46
PHL	0.23	2.18	2.44	1.95	2.21
THA	0.53	0.70	0.70	0.17	0.17
CHN	0.50	1.31	1.54	0.80	1.04
KOR	0.06	0.13	0.17	0.08	0.12
SGP	0.20	0.18	0.18	−0.02	−0.02
HKG	0.81	0.78	0.77	−0.02	−0.04
TWN	0.00	0.16	0.19	0.16	0.19
USA	−0.22	−0.21	−0.21	0.01	0.01
CAN	−0.03	0.01	0.01	0.04	0.04
MEX	−0.10	−0.08	−0.07	0.02	0.02
CHL	0.12	0.45	0.45	0.32	0.32
VNM	0.09	0.24	0.23	0.15	0.15
RUS	0.05	0.07	0.07	0.02	0.02
LTN	0.17	0.17	0.17	0.01	0.00
WEU	0.04	0.04	0.04	−0.00	−0.00
ROW	0.50	0.51	0.51	0.00	0.00

(3) Impact on Each Industry / Commodity in the world

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
AGR	0.10	0.14	0.14	0.05	0.05
MNG	0.03	0.10	0.10	0.06	0.06
PFD	−0.05	−0.02	−0.02	0.03	0.03
TXL	0.30	0.33	0.31	0.03	0.01
CHM	−0.03	0.05	0.05	0.08	0.08
MTL	0.18	0.23	0.22	0.05	0.04
TRN	0.71	0.77	0.75	0.06	0.04
OME	0.50	0.71	0.72	0.21	0.22
OMF	−0.04	0.02	0.00	0.05	0.04
EGW	−0.07	−0.04	−0.05	0.02	0.02
CNS	0.24	0.37	0.39	0.13	0.15
T_T	0.08	−0.10	−0.09	−0.18	−0.17
OSP	−0.09	−0.07	−0.07	0.03	0.02
OSG	−0.28	−0.24	−0.24	0.04	0.04

Table 4-8 Estimated Change in Export Volume (CA1 model)

(1) Impact on APEC and WORLD

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
Impact on APEC	7.93	10.71	11.22	2.78	3.30
Impact on WORLD	5.28	6.62	6.85	1.34	1.58

(2) Impact on Each Economy

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
AUS	1.08	2.22	2.80	1.15	1.72
NZL	4.64	9.24	9.22	4.59	4.58
JPN	8.29	9.34	9.47	1.05	1.18
IDN	0.17	1.67	1.67	1.50	1.50
MYS	13.43	19.24	19.43	5.81	6.00
PHL	−1.65	17.80	21.96	19.45	23.61
THA	4.75	8.57	8.60	3.82	3.85
CHN	4.99	14.97	18.66	9.99	13.67
KOR	2.64	4.04	5.54	1.40	2.90
SGP	1.72	5.63	5.80	3.91	4.08
HKG	2.82	3.95	4.23	1.13	1.40
TWN	−0.50	3.26	3.75	3.77	4.25
USA	16.84	18.51	18.57	1.67	1.73
CAN	2.28	3.76	3.78	1.48	1.50
MEX	3.21	4.77	4.64	1.57	1.43
CHL	2.97	15.85	15.87	12.89	12.90
VNM	1.02	1.24	1.21	0.22	0.19
RUS	3.15	3.52	3.50	0.37	0.35
LTN	6.02	6.29	6.32	0.27	0.29
WEU	1.33	1.46	1.47	0.13	0.13
ROW	10.10	10.16	10.16	0.05	0.06

(3) Impact on Each Industry / Commodity in the world

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
AGR	4.14	5.71	5.80	1.58	1.66
MNG	1.94	2.82	2.89	0.89	0.95
PFD	6.61	8.22	8.30	1.62	1.70
TXL	8.52	11.95	12.69	3.43	4.18
CHM	5.64	7.19	7.33	1.54	1.68
MTL	4.92	7.04	7.24	2.13	2.33
TRN	3.15	5.42	5.57	2.26	2.41
OME	8.44	10.79	11.24	2.36	2.81
OMF	3.69	5.70	6.05	2.01	2.37
EGW	−0.67	−0.34	−0.25	0.33	0.41
CNS	2.29	2.72	2.70	0.43	0.41
T_T	3.56	1.11	1.17	−2.46	−2.39
OSP	2.82	3.21	3.24	0.39	0.42
OSG	0.96	1.46	1.50	0.50	0.54

Table 4-9 Estimated Change in Real Income (CA1 model)

(1) Impact on APEC and WORLD

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
Impact on APEC	0.68	1.05	1.10	0.37	0.42
Impact on WORLD	0.53	0.76	0.79	0.23	0.25

(2) Impact on Each Economy

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
AUS	0.26	0.53	0.55	0.27	0.29
NZL	2.99	4.05	4.05	1.06	1.06
JPN	0.92	1.02	1.04	0.11	0.13
IDN	0.14	1.10	1.12	0.96	0.97
MYS	6.19	10.57	10.73	4.38	4.54
PHL	−0.85	2.88	3.54	3.73	4.39
THA	1.14	3.49	3.50	2.36	2.36
CHN	3.08	5.36	5.90	2.28	2.83
KOR	0.03	0.54	0.79	0.51	0.76
SGP	1.94	3.47	3.56	1.52	1.61
HKG	0.30	0.44	0.37	0.14	0.07
TWN	−0.36	1.28	1.52	1.65	1.89
USA	0.33	0.43	0.43	0.10	0.10
CAN	−1.33	−0.63	−0.61	0.69	0.72
MEX	3.34	4.29	4.18	0.95	0.83
CHL	2.14	5.20	5.21	3.06	3.07
VNM	0.28	0.83	0.85	0.55	0.57
RUS	0.58	0.76	0.77	0.18	0.18
LTN	0.91	0.93	0.93	0.02	0.02
WEU	−0.02	0.01	0.02	0.03	0.03
ROW	1.40	1.43	1.44	0.04	0.04

(3) Impact on Each Industry / Commodity in the world

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
AGR	0.53	0.77	0.79	0.24	0.27
MNG	0.79	1.17	1.21	0.38	0.42
PFD	0.24	0.39	0.40	0.15	0.16
TXL	0.78	1.03	1.05	0.25	0.27
CHM	0.57	0.89	0.92	0.32	0.36
MTL	0.92	1.29	1.33	0.37	0.41
TRN	1.27	1.58	1.59	0.32	0.32
OME	1.31	1.88	1.92	0.57	0.62
OMF	0.52	0.78	0.80	0.27	0.28
EGW	0.54	0.77	0.79	0.22	0.25
CNS	1.05	1.47	1.52	0.42	0.48
T_T	0.59	0.61	0.64	0.02	0.04
OSP	0.33	0.51	0.52	0.17	0.19
OSG	−0.07	0.08	0.09	0.14	0.15

Table 4-10 Estimated Change in Export Volume (CA2 model)

(1) Impact on APEC and WORLD

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
Impact on APEC	7.46	10.20	10.71	2.74	3.26
Impact on WORLD	5.07	6.39	6.63	1.32	1.56

(2) Impact on Each Economy

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
AUS	1.11	2.26	2.83	1.15	1.72
NZL	4.46	9.05	9.04	4.59	4.57
JPN	8.28	9.34	9.48	1.06	1.19
IDN	4.34	5.93	5.93	1.58	1.59
MYS	12.69	18.54	18.73	5.85	6.04
PHL	0.13	19.84	24.09	19.71	23.96
THA	4.88	8.70	8.73	3.82	3.85
CHN	5.04	15.03	18.72	9.98	13.67
KOR	2.83	4.22	5.72	1.40	2.90
SGP	2.32	6.27	6.45	3.95	4.12
HKG	2.89	4.02	4.30	1.13	1.40
TWN	−0.13	3.63	4.11	3.77	4.25
NAFTA	11.25	12.74	12.78	1.49	1.53
CHL	3.24	15.80	15.82	12.56	12.58
VNM	0.77	0.98	0.95	0.21	0.18
RUS	3.12	3.50	3.48	0.37	0.35
LTN	5.98	6.24	6.26	0.26	0.28
WEU	1.36	1.48	1.49	0.12	0.13
ROW	10.06	10.11	10.12	0.05	0.06

(3) Impact on Each Industry / Commodity in the world

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
AGR	4.51	6.07	6.16	1.57	1.65
MNG	1.83	2.80	2.86	0.97	1.03
PFD	6.31	7.90	7.98	1.59	1.67
TXL	8.48	11.89	12.64	3.41	4.16
CHM	5.58	7.09	7.23	1.51	1.65
MTL	4.60	6.69	6.89	2.09	2.29
TRN	2.82	4.92	5.06	2.09	2.24
OME	7.87	10.21	10.67	2.35	2.80
OMF	3.71	5.72	6.07	2.01	2.36
EGW	−0.39	−0.07	0.00	0.31	0.39
CNS	2.30	2.69	2.69	0.39	0.38
T_T	3.45	1.03	1.10	−2.42	−2.35
OSP	2.90	3.25	3.28	0.35	0.38
OSG	1.16	1.65	1.69	0.49	0.53

Table 4-11 Estimated Change in Real Income (CA2 model)

(1) Impact on APEC and WORLD

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
Impact on APEC	0.64	1.00	1.04	0.35	0.40
Impact on WORLD	0.51	0.73	0.76	0.21	0.24

(2) Impact on Each Economy

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
AUS	0.26	0.53	0.55	0.27	0.29
NZL	2.84	3.89	3.89	1.05	1.05
JPN	0.91	1.02	1.04	0.11	0.13
IDN	0.68	1.62	1.63	0.94	0.95
MYS	5.39	9.80	9.97	4.41	4.57
PHL	−0.47	3.29	3.94	3.76	4.42
THA	1.17	3.52	3.53	2.35	2.36
CHN	3.11	5.37	5.92	2.26	2.81
KOR	0.09	0.60	0.85	0.52	0.76
SGP	2.19	3.73	3.82	1.55	1.64
HKG	0.27	0.41	0.35	0.14	0.07
TWN	−0.13	1.51	1.75	1.64	1.88
NAFTA	0.22	0.35	0.35	0.13	0.13
CHL	2.04	5.14	5.16	3.09	3.11
VNM	0.06	0.60	0.62	0.54	0.56
RUS	0.59	0.76	0.77	0.17	0.18
LTN	0.88	0.90	0.89	0.02	0.02
WEU	−0.01	0.02	0.03	0.03	0.03
ROW	1.39	1.42	1.43	0.03	0.03

(3) Impact on Each Industry / Commodity in the world

				Beyond UR	
	UR	UR+MAPA	UR+IAP98	MAPA	IAP98
AGR	0.50	0.73	0.75	0.23	0.26
MNG	0.74	1.11	1.15	0.36	0.41
PFD	0.18	0.32	0.33	0.14	0.15
TXL	0.72	0.96	0.97	0.24	0.26
CHM	0.51	0.82	0.85	0.31	0.34
MTL	0.90	1.26	1.30	0.36	0.40
TRN	1.14	1.42	1.43	0.28	0.29
OME	1.24	1.80	1.85	0.56	0.61
OMF	0.49	0.74	0.76	0.26	0.27
EGW	0.54	0.75	0.78	0.21	0.23
CNS	1.03	1.44	1.49	0.41	0.46
T_T	0.55	0.56	0.59	0.01	0.03
OSP	0.32	0.48	0.50	0.16	0.18
OSG	−0.04	0.09	0.11	0.14	0.15

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Results of Tariff Rates Calculation

(Note)

1. Title

The title of tariff tables contains two parts. The former is the code which represents economies' name shown as below. Table (A) is for the APEC economies, and table (B) for other economies. The latter, which is in a parenthesis, represents the time points such as "Current," "UR," "UR+IAP96," "UR+IAP98."

2. Vertical Axis

The code of vertical axis represents Commodity/Industry group name. (See note of Table 2-4)

3. Horizontal Axle

The code of horizontal axle represents economies' name shown as below.

4. Figure

The figure in each cell reports a tariff rate donated as percent on *ad valorem* basis. "***" is donated when no import exists in the GTAP database version 4.0. "N.A." means not available because calculations of the cell have not been done.

(A) Code of APEC economies

CODE	Economies' Name	CODE	Economies' Name
AUS	Australia	MEX	Mexico
CAN	Canada	NZL	New Zealand
CHL	Chile	PHL	The Philippines
CHN	China	RUS	Russia
HKG	Hong Kong	SGP	Singapore
IDN	Indonesia	TWN	Chinese Taipei
JPN	Japan	THA	Thailand
KOR	Korea	USA	The United States of America
MYS	Malaysia	VNM	Viet Nam

Source : GTAP database version 4.0

(B) Code of Other economies

CODE	Economies' Name	CODE	Economies' Name
CAM	Central America and the Caribbean	EFT	EFTA
VEN	Venezuela	WEU	Sum of GBR, DEU, DNK, SWE, FIN, REU, and EFT
COL	Colombia	IND	India
RAP	Rest of Andean Pact	LKA	Sri Lanka
ARG	Argentina	RAS	Rest of South Asia
BRA	Brazil	CEA	Central European Associates
URY	Uruguay	TUR	Turkey
RSM	Rest of South America	RME	Rest of Middle East
LTN	Sum of CAM, VEN, COL, RAP, ARG, BRA, URY, and RSM	MAR	Morocco
GBR	United Kingdom	RNF	Rest of North Africa
DEU	Germany	SAF	South Africa Custom Union
DNK	Denmark	RSA	Rest of southern Africa
SWE	Sweden	RSS	Rest of sub-Saharan Africa
FIN	Finland	row	Rest of the world
REU	Rest of European Union	ROW	Sum of IND, LKA, RAS, CEA, TUR, RME, MAR, RNF, SAF, RSA, RSS, and row

Source : GTAP database version 4.0