The Economic Effects of Bilateral Free Trade Areas among ASEAN, China, Japan and Korea

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East Asian countries endeavor to speed up trade liberalization by making free trade arrangements. This paper studies the economic effects of bilateral Free Trade Areas (FTAs) among ASEAN, China, Japan and South Korea. We used the GTAP version 5 database and aggregated countries into 10 regions and industries into 10 sectors.

We studied four trade reform arrangements, i.e. ASEAN China FTA, ASEAN Japan FTA, ASEAN Korea FTA, Korea China FTA and compared the changes in welfare in a comparative static environment. We also examined the welfare consequences of making free trade arrangements with the exception of the rice industry. As we move from the case of the full-fledged free trade area to the case of the non-rice free trade area, the welfare gain does not increase due to the smaller gains from trade.

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1. INTRODUCTION

East Asian countries endeavor to speed up trade liberalization by making free trade arrangements. South Korea and Chile reached an agreement to create a free trade area after negotiating for three years. They ruled out apples, pears and rice on the part of Korea and refrigerators, washing machines, and finance on the part of Chile in the elimination of tariffs. Korea is now preparing for negotiating with Singapore for a free trade pact. On the other hand, ASEAN signed an agreement with China on negotiating a free trade zone by 2010, and ASEAN agreed to begin liberalizing trade and investment with Japan. Japan has

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signed a bilateral free trade pact with Singapore.

This paper studies the economic effects of bilateral Free Trade Areas (FTAs) among ASEAN, China, Japan, and South Korea. We studied four trade reform arrangements, i.e. ASEAN China FTA, ASEAN Japan FTA, ASEAN Korea FTA, Korea China FTA and compared the changes in welfare in a comparative static environment.

Hertel (1977) introduced the basic structure of Global Trade Analysis Project (GTAP) and Young and Huff (1997) compared three different scenarios of the free trade area among APEC member nations.

We used the GTAP version 5 database collected by Dimaranan and McDougall (2001), and aggregated countries into 10 regions and industries into 10 sectors. We did not include non-tariff barriers such as quota or antidumping duties in our analysis. When we compare the bilateral FTAs, we used welfare decomposition developed by Huff and Hertel (2000).

The design of experiments is introduced in section 2, the economic effects of FTAs are analyzed in section 3 and the conclusion follows in section 4.

2. DESIGN OF EXPERIMENTS

We use the competitive equilibrium GTAP model where technology exhibits constant returns to scale. Capital stock can be increased through savings within a region and the elasticity of interest rate with respect to capital stock (RORFLEX) is assumed to be 10. Investment funds are allocated across regions to equate the change in the expected rates of return.

Land and capital are combined with labor to produce output in each region. Land is assumed to be a sluggish factor and both capital and labor are assumed to be mobile factors.

The experiments involve the complete removal of import tariffs among the member countries of FTAs. We do not take non-tariff barriers or scale economies into consideration.

We aggregated countries into 10 regions and industries into 10 sectors.

Regions:

1. USA (USA)
2. Canada and Mexico (CAM)

3. Japan	(JPN)
4. Australia and New Zealand	(ANZ)
5. China and Hong Kong	(CHN)
6. South Korea	(SKOR)
7. Taiwan	(TWN)
8. Malaysia, Singapore, Indonesia, Thailand, the Philippines, Vietnam	(ASEAN)
9. Chile and Peru	(SAM)
10. Rest of the World	(ROW)

We used the GTAP version 5 database. Brunei, Cambodia, Laos, and Myanmar are members of ASEAN but the data is not available, and these countries are also included in the ROW region.

Sectors:

1. Unprocessed and Processed rice	(Rice)
2. Farm products except rice	(Farm)
3. Forestry and Fishing	(F_F)
4. Mining	(Mine)
5. Textiles and Wearing apparel	(Tex_wap)
6. Ferrous metals	(I_S)
7. Motor vehicles and Other Transport Equipment	(Mvh_otn)
8. Electronic equipment	(Eteq)
9. Other manufactures	(Mnfcs)
10. Services	(Svces)

We set up the following experiment and analyzed bilateral free trade areas in East Asia.

Experiment 1: Preferential Free Trade Area. Import tariffs within FTA are removed but maintained between the Rest of the World (ROW) and FTA.

We also analyzed the non-rice free trade area. Japan, Korea, ASEAN impose either high tariffs or quota on their import of rice and these Asian countries oppose removing rice protection.

Experiment 2: Non-rice Preferential Free Trade Area. This experiment is almost the same as Experiment 1 except that tariffs in the rice industry are

maintained among all member nations.

3. THE ECONOMIC EFFECTS OF FTAS

3.1. ASEAN China FTA

We studied ASEAN China FTA and Table 1-A shows the change in trade balance measured in terms of $US million for the case of Experiment 1.

ASEAN's trade balance deteriorates by 2.98 billion dollars and China's trade balance deteriorates by 2.46 billion dollars. The trade balances of the United States, Japan and the ROW region improve because the economy of FTA member countries grows and they import more products from the rest of the world. ASEAN exhibits a large improvement in trade balance in rice, farm products, moving vehicle and other transport equipment, electronic equipment, and other manufactures. The trade balance of China improves in the textile and wearing apparel industry and electronic equipment industry.

ASEAN's capital stock increases by 1.96% and China's capital stock increases by 0.73% if ASEAN China FTA is established.

Table 1-B shows the effect of ASEAN China FTA on the volume of total exports for the case of Experiment 1. The unit of measurement is 1997$US million. The volume of total exports from CHN to ASEAN increases by 8.5 billion dollars and that from ASEAN to CHN increases by 10.3 billion dollars. The volume of total exports between China and Hong Kong increases by 7.8 billion dollars and that among the Southeast Asian nations increases by 14.7 billion dollars. The volume of total exports from ASEAN and CHN to the countries outside ASEAN China FTA decreases.

Table 1-C shows the effect of trade liberalization on welfare for the case of Experiment 1. China's GDP increases by 0.011% and ASEAN's GDP increases by 0.08%. China's terms of trade improves by 0.454 % and ASEAN's terms of trade improves by 0.88 %. Per capita utility increases by 0.171 % in case of China and it increases by 0.722 % in case of ASEAN. China's welfare gain is 1.52 billion dollars, which results from the terms of trade improvement. ASEAN's welfare gain is 4.19 billion dollars, which results from the terms of trade improvement. Japan's welfare loss is 1.69 billion dollars and Korea's welfare loss is 0.55 billion dollars. The welfare

losses of both countries are caused by worsening terms of trade.

Table 1-D shows the effect of trade liberalization on welfare for the case of Experiment 2. If we compare Table 1-C with Table 1-D, China's welfare gain decreases from 1.52 billion dollars to 1.48 billion dollars, and ASEAN's welfare gain decreases from 4.19 billion dollars to 4.04 billion dollars as we move from the case of the full-fledged free trade area (Experiment 1) to the case of the non-rice free trade area (Experiment 2). China's terms of trade improves but the offsetting welfare loss due to the less efficient resource allocation is far larger. ASEAN's welfare gain decreases because the terms of trade becomes worse and resource allocation becomes less efficient. As both trading partners lose welfare with the non-rice free trade area, it is likely that both countries will engage in the full-fledged free trade area.

3.2. ASEAN Japan FTA

We studied ASEAN Japan FTA and Table 2-A shows the change in trade balance measured in terms of $US million for the case of Experiment 1. Japan's trade balance deteriorates by 2.05 billion dollars, and ASEAN's trade balance becomes worse by 3.27 billion dollars. Japan exhibits a large improvement in trade balance in ferrous metals, moving vehicle and other transport equipment, and other manufactures. ASEAN exhibits a large improvement in trade balance in rice, farm products, textiles and wearing apparel, and electronic equipment.

Japan's capital stock increases by 0.23 %, and ASEAN's capital stock increases by 3 % if ASEAN Japan FTA is established.

Table 2-B shows the effect of ASEAN Japan FTA on the volume of total exports for the case of Experiment 1. The unit of measurement is 1997 $US million. The volume of total exports from JPN to ASEAN increases by 27.6 billion dollars and the volume from ASEAN to JPN increases by 16.1 billion dollars. The volume of total exports inside the Southeast Asian nations also increases by 11.2 billion dollars.

Table 2-C shows the effect of trade liberalization on welfare for the case of Experiment 1. Japan's per capita utility increases by 0.11 % and its welfare improves by 3.89 billion dollars. ASEAN's per capita utility increases by 0.99 % and its welfare improves by 5.75 billion dollars. The

welfare improvements of both trading partners are attributable to the more efficient resource allocation and the terms of trade improvement. China's welfare loss is 0.99 billion dollars and Korea's welfare loss is 0.7 billion dollars.

Table 2-D shows the effect of trade liberalization on welfare for the case of Experiment 2. If we compare Table 2-C with Table 2-D, Japan's welfare gain decreases from 3.89 billion dollars to 2 billion dollars, and ASEAN's welfare gain decreases from 5.75 billion dollars to 4.82 billion dollars. As we move from Experiment 1 to Experiment 2, the terms of trade for Japan improve and the terms of trade for ASEAN deteriorate because Japan would be the importer of rice, ASEAN would be the exporter of rice and the tariff on rice import is established. Even though the terms of trade for Japan improve, the offsetting welfare loss due to the less efficient resource allocation is far larger.

3.3. ASEAN Korea FTA

We studied ASEAN Korea FTA and Table 3-A shows the change in trade balance measured in terms of $US million for the case of Experiment 1.

ASEAN's trade balance deteriorates by 3.58 billion dollars and Korea's trade balance deteriorates by 0.96 billion dollars. The trade balances of the United States, Japan, and the ROW region improve. ASEAN exhibits a large improvement in trade balance in farm products, electronic equipment, and other manufactures. The trade balance of Korea improves in motor vehicles and other transport equipment.

ASEAN's capital stock increases by 2.3%, and Korea's capital stock increases by 1.82% if ASEAN Korea FTA is established.

Table 3-B shows the effect of ASEAN Korea FTA on the volume of total exports for the case of Experiment 1. The unit of measurement is 1997$US million. The volume of total exports from SKOR to ASEAN increases by 20.6 billion dollars and that from ASEAN to SKOR increases by 4.6 billion dollars. The volume of total exports inside the Southeast Asian nations also increases by 15.1 billion dollars.

Table 3-C shows the effect of trade liberalization on welfare for the case of Experiment 1. Korea's per capita utility increases by 1.35% and its welfare improves by 5.32 billion dollars. ASEAN's per capita utility

increases by 0.4% and its welfare improves by 2.34 billion dollars. The welfare gains of both trading partners result from the more efficient resource allocation and the terms of trade improvement. Japan's welfare loss is 1.79 billion dollars and China's welfare loss is 0.83 billion dollars.

Table 3-D shows the effect of trade liberalization on welfare for the case of Experiment 2. If we compare Table 3-C with Table 3-D, ASEAN's welfare increment becomes reduced from 2.34 billion dollars to 2.28 billion dollars due to the less efficient resource allocation, and Korea's welfare gain is almost the same, as we move from the case of the full-fledged free trade area (Experiment 1) to the case of the non-rice free trade area (Experiment 2).

3.4. ASEAN China, ASEAN Japan FTA

If both ASEAN China FTA and ASEAN Japan FTA are established, Table 4-A shows the effect of trade liberalization on welfare for the case of Experiment 1. Japan' per capita utility increases by 0.08% and its welfare improves by 2.99 billion dollars. China' per capita utility increases by 0.08% and its welfare improves by 7 billion dollars. ASEAN' per capita utility increases by 1.29% and its welfare improves by 7.47 billion dollars. On the other hand, Korea's per capita utility decreases by 0.27% and its welfare deteriorates by 1.08 billion dollars. The welfare gains of Japan and ASEAN are attributable to the more efficient resource allocation and the favorable shift in the terms of trade. China's welfare gain is mainly attributable to the more efficient resource allocation.

Table 4-B shows the effect of trade liberalization on welfare for the case of Experiment 2. In this experiment, tariffs in the rice industry are maintained between ASEAN and Japan. If we compare Table 4-A with Table 4-B, Japan's welfare increment becomes reduced from 2.99 billion dollars to 1.13 billion dollars, ASEAN's welfare increment becomes reduced from 7.47 billion dollars to 6.61 billion dollars, and China's welfare gain is almost the same.

3.5 Korea China FTA

We studied Korea China FTA and Table 5-A shows the change in trade

balance measured in terms of $US million for the case of Experiment 1.

Korea's trade balance deteriorates by 3.07 billion dollars and China's trade balance becomes worse by 1.11 billion dollars. The trade balances of the United States, and the ROW region improve because the economy of FTA member countries grows and they import more products from the rest of the world. Korea exhibits a large improvement in trade balance in textile and wearing apparel, other manufactures and China in farm products, and electronic equipment.

Korea's capital stock increases by 2.18% and China's capital stock increases by 0.57% if Korea China FTA is established.

Table 5-B shows the effect of Korea China FTA on the volume of total exports for the case of Experiment 1. The unit of measurement is 1997$US million. The volume of total exports from CHN to SKOR increases by 16.1 billion dollars and that from SKOR to CHN increases by 17.8 billion dollars. The volume of trade between China and Hong Kong increases by 5.5 billion dollars.

Table 5-C shows the effect of trade liberalization on welfare for the case of Experiment 1. Korea's per capita utility increases by 1.23% and its welfare improves by 4.82 billion dollars. China's per capita utility increases by 0.25% and its welfare improves by 2.24 billion dollars. The welfare gains of both trading partners result from the more efficient resource allocation and the terms of trade improvement. Japan's welfare loss is 0.52 billion dollars and ASEAN's welfare loss is 0.6 billion dollars.

Table 5-D shows the effect of trade liberalization on welfare for the case of Experiment 2. If we compare Table 5-C with Table 5-D, Korea and China do not experience any welfare change, as we move from the case of the full-fledged free trade area (Experiment 1) to the case of the non-rice free trade area (Experiment 2).

4. CONCLUSION

In this paper, we studied the economic effects of bilateral Free Trade Areas among the East Asian nations. Asian countries such as Japan and Korea are reluctant to remove the protection of their rice industry from

cheap foreign sources. Non-rice free trade areas might be an interim procedure of the full-fledged free trade area in this region.

If two trading partners make free trade arrangements, both members gain in terms of welfare and the rest of the world loses in terms of welfare. In case of ASEAN China FTA, ASEAN's welfare improves by 4.19 billion dollars and China's welfare improves by 1.5 billion dollars. Japan's welfare loss is 1.69 billion dollars and Korea's welfare loss amounts to 0.55 billion dollars.

In case of ASEAN Japan FTA, ASEAN's welfare improves by 5.75 billion dollars and Japan's welfare improves by 3.89 billion dollars. China's welfare loss is 0.99 billion dollars and Korea's welfare loss amounts to 0.7 billion dollars. In case of ASEAN Korea FTA, ASEAN's welfare improves by 2.34 billion dollars and Korea's welfare improves by 5.32 billion dollars. Japan's welfare loss is 1.79 billion dollars and China's welfare loss amounts to 0.83 billion dollars.

If both ASEAN China FTA and ASEAN Japan FTA are established, the welfare increments of Japan, China, and ASEAN become 2.99, 0.7, 7.47 billion dollars respectively, and the welfare loss of Korea amounts to 1.08 billion dollars.

In case of Korea China FTA, Korea's welfare improves by 4.82 billion dollars and China's welfare improves by 2.24 billion dollars. Japan's welfare loss is 0.52 billion dollars and ASEAN's welfare loss amounts to 0.6 billion dollars.

If we consider the non-rice free trade area, there is no difference of welfare gain between the two experiments in case of Korea China FTA, as we move from the case of the full-fledged free trade area (Experiment 1) to the case of the non-rice free trade area (Experiment 2). In other cases, the welfare gain decreases due to the smaller gains from trade or the welfare gain does not change much.

If two countries make free trade arrangements, the trade balance for them becomes worse because they increase their import from the rest of the world with the economic growth.

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Table 1-A Change in Trade Balance (ASEAN China FTA, Experiment 1, $ US million)

	1 USA	2 CAM	3 JPN	4 ANZ	5 CHN	6 SKOR	7 TWN	8 ASEAN	9 SAM	10 ROW	Total
Rice	9	0	2	-22	-360	0	0	**276**	1	14	-78
Farm	-118	-28	178	-218	-781	38	52	**636**	-32	-206	-479
F_F	28	8	38	17	-66	10	12	-150	2	100	-2
Mine	142	44	-22	258	-171	0	-9	-1862	37	1561	-22
Tex_wap	-4	-21	-348	-69	**2010**	-525	-641	-149	0	-531	-279
I_S	38	-2	152	7	-129	57	58	-230	0	9	-39
Mvh_otn	-249	-196	654	-3	-400	238	116	**1011**	0	-1268	-97
Eteq	-342	-54	-209	-5	**461**	-92	-14	**748**	1	-518	-24
Mnfcs	348	123	-193	-75	-1661	-11	99	**2044**	-18	-953	-296
Svces	1666	250	1126	169	-1358	450	271	-5302	30	4015	1317
Total	1518	124	1378	61	**-2456**	165	-56	**-2978**	21	2224	0

Table 1-B Effect of ASEAN China FTA on Volume of Total Exports

(1997 $US million, evaluated at exporter market prices, Experiment 1)

To / From	1 USA	2 CAM	3 JPN	4 ANZ	5 CHN	6 SKOR	7 TWN	8 ASEAN	9 SAM	10 ROW	TOTAL
1 USA	0	168	190	40	-722	6	-11	-1317	17	1395	-233
2 CAM	-79	-12	34	2	-103	0	-3	-29	-1	67	-124
3 JPN	1134	107	0	89	-1045	139	155	-1919	15	1537	210
4 ANZ	44	8	150	26	-142	30	43	-394	1	137	-98
5 CHN	-1665	-132	-990	-120	**7830**	-309	-179	**8491**	-30	-2479	10418
6 SKOR	225	36	130	25	-724	0	25	-642	11	612	-301
7 TWN	465	46	174	33	-745	23	0	-672	6	447	-223
8 ASEAN	-2635	-419	-2421	-398	**10328**	-695	-562	**14723**	-41	-6063	11818
9 SAM	9	0	25	0	-32	1	-3	-22	0	18	-2
10 ROW	132	-14	311	36	-1202	63	-40	-1298	1	720	-1290
TOTAL	-2368	-210	-2396	-268	13444	-744	-575	16922	-20	-3608	20175

Table 1-C Effect of Trade Liberalization on Welfare (ASEAN China FTA, Experiment 1)

	GDP Quantity Index (% of change)	Terms of Trade (% of change)	Per Capita Utility (% of change)	Welfare ($ US million)	Welfare Decomposition ($ US million)		
					Allocative Efficiency	Terms of Trade Improvement	Investment and Savings
USA	-0.002	-0.115	-0.019	-1359	-139	-999	-221
CAM	-0.001	0.001	-0.003	-25	-15	-19	8
JPN	-0.007	-0.321	-0.046	**-1689**	-280	-1542	133
ANZ	-0.005	-0.162	-0.042	-173	-23	-144	-5
CHN	0.011	0.454	0.171	**1519**	**109**	**1361**	**49**
SKOR	-0.022	-0.282	-0.141	**-553**	-96	-457	0
TWN	-0.013	-0.345	-0.156	-435	-40	-475	79
ASEAN	0.080	0.880	0.722	**4189**	**523**	**3616**	**50**
SAM	-0.003	-0.037	-0.013	-17	-4	-9	-4
ROW	-0.003	-0.038	-0.017	-1879	-432	-1358	-89
TOTAL				-422	-396	-26	0

Table 1-D Effect of Trade Liberalization on Welfare (ASEAN China FTA, Experiment 2)

	GDP Quantity Index (% of change)	Terms of Trade (% of change)	Per Capita Utility (% of change)	Welfare ($ US million)	Welfare Decomposition ($ US million)		
					Allocative Efficiency	Terms of Trade Improvement	Investment and Savings
USA	-0.002	-0.115	-0.019	-1362	-140	-1001	-221
CAM	-0.001	0.001	-0.003	-25	-15	-18	8
JPN	-0.007	-0.321	-0.046	-1693	-282	-1544	133
ANZ	-0.005	-0.154	-0.041	-167	-24	-138	-5
CHN	-0.001	0.480	0.167	**1484**	**-5**	**1437**	**51**
SKOR	-0.022	-0.282	-0.142	-557	-99	-458	0
TWN	-0.013	-0.344	-0.156	-434	-40	-473	79
ASEAN	0.069	0.862	0.696	**4040**	**452**	**3539**	**49**
SAM	-0.003	-0.036	-0.013	-17	-4	-9	-4
ROW	-0.003	-0.038	-0.017	-1884	-434	-1361	-89
TOTAL				-616	-590	-26	0

Table 2-A Change in Trade Balance (ASEAN Japan FTA, Experiment 1, $ US million)

	1 USA	2 CAM	3 JPN	4 ANZ	5 CHN	6 SKOR	7 TWN	8 ASEAN	9 SAM	10 ROW	Total
Rice	-73	1	-3601	-51	-9	-1	-1	**3399**	2	43	-289
Farm	-1027	-192	-6027	-148	-123	-53	-50	**7155**	-82	100	-447
F_F	39	4	-71	15	35	11	10	-144	2	90	-8
Mine	241	-17	-282	269	148	8	-7	-1788	41	1388	2
Tex_wap	237	-19	21	-12	-277	-34	-100	**180**	2	-51	-53
I_S	78	-12	**602**	-44	-18	-30	-16	-79	1	-459	23
Mvh_otn	-1696	90	**10822**	-108	-268	-420	-203	-4876	8	-3651	-301
Eteq	420	40	-1953	16	-2	42	64	**1143**	4	216	-11
Mnfcs	1610	-43	**854**	-44	320	175	14	-2795	7	-271	-172
Svces	2377	237	-2410	203	432	477	238	-5468	38	5132	1255
Total	2207	89	**-2045**	97	237	177	-50	**-3274**	23	2539	0

Table 2-B Effect of ASEAN Japan FTA on Volume of Total Exports

(1997 $US million, evaluated at exporter market prices, Experiment 1)

From \ To	1 USA	2 CAM	3 JPN	4 ANZ	5 CHN	6 SKOR	7 TWN	8 ASEAN	9 SAM	10 ROW	TOTAL
1 USA	0	998	-506	138	332	196	178	-5444	39	2413	-1654
2 CAM	511	-3	-217	4	19	5	7	-191	0	31	166
3 JPN	-5165	-581	0	-412	-1605	-820	-827	**27573**	-70	-6002	12092
4 ANZ	53	9	-285	50	66	43	56	-308	1	148	-167
5 CHN	250	10	-380	20	118	59	51	-1259	3	369	-760
6 SKOR	260	38	66	39	271	0	61	-1741	14	619	-374
7 TWN	308	26	88	21	319	25	0	-1283	3	253	-241
8 ASEAN	-2256	-425	**16133**	-413	-1408	-695	-285	**11236**	-46	-6445	15394
9 SAM	17	1	-79	1	12	7	6	-9	1	32	-11
10 ROW	649	65	767	125	362	246	139	-7609	14	2844	-2398
TOTAL	-5372	137	15585	-427	-1514	-934	-614	20963	-41	-5737	22048

Table 2-C Effect of Trade Liberalization on Welfare (ASEAN Japan FTA, Experiment 1)

	GDP Quantity Index (% of change)	Terms of Trade (% of change)	Per Capita Utility (% of change)	Welfare ($ US million)	Welfare Decomposition ($ US million)		
					Allocative Efficiency	Terms of Trade Improvement	Investment and Savings
USA	-0.003	-0.230	-0.034	-2419	-228	-2039	-152
CAM	-0.004	0.014	0.004	37	-36	14	59
JPN	0.042	0.457	0.107	**3886**	**1802**	**2422**	**-338**
ANZ	-0.009	-0.234	-0.058	-238	-40	-210	12
CHN	-0.024	-0.261	-0.111	**-987**	-241	-786	40
SKOR	-0.032	-0.367	-0.177	**-696**	-141	-593	38
TWN	-0.021	-0.370	-0.167	-465	-62	-481	77
ASEAN	0.280	0.946	0.990	**5747**	**1832**	**3915**	**0**
SAM	-0.005	-0.080	-0.020	-26	-7	-20	1
ROW	-0.008	-0.063	-0.027	-2990	-1003	-2251	264
TOTAL				1850	1877	-29	1

Table 2-D Effect of Trade Liberalization on Welfare (ASEAN Japan FTA, Experiment 2)

	GDP Quantity Index (% of change)	Terms of Trade (% of change)	Per Capita Utility (% of change)	Welfare ($ US million)	Welfare Decomposition ($ US million)		
					Allocative Efficiency	Terms of Trade Improvement	Investment and Savings
USA	-0.003	-0.226	-0.033	-2350	-216	-2017	-116
CAM	-0.004	0.014	0.005	42	-37	19	59
JPN	-0.020	0.628	0.055	**1996**	**-843**	**3246**	**-406**
ANZ	-0.009	-0.235	-0.058	-238	-41	-210	13
CHN	-0.024	-0.258	-0.108	-962	-236	-775	50
SKOR	-0.033	-0.368	-0.178	-701	-146	-595	41
TWN	-0.022	-0.377	-0.171	-476	-65	-485	75
ASEAN	0.274	0.736	0.830	**4817**	**1789**	**3038**	**-9**
SAM	-0.005	-0.086	-0.021	-27	-7	-22	2
ROW	-0.008	-0.062	-0.026	-2895	-965	-2223	294
TOTAL				-793	-769	-26	2

Table 3-A Change in Trade Balance (ASEAN Korea FTA, Experiment 1, $ US million)

	1 USA	2 CAM	3 JPN	4 ANZ	5 CHN	6 SKOR	7 TWN	8 ASEAN	9 SAM	10 ROW	Total
Rice	6	0	3	1	-7	-4	0	-47	0	5	-42
Farm	-92	-18	239	-142	-28	-1309	18	**1154**	-19	-103	-298
F_F	24	5	38	9	23	-53	6	-109	0	59	2
Mine	103	12	-41	112	60	90	-13	-1032	11	635	-62
Tex_wap	196	29	150	-16	-83	-110	-148	-382	3	355	-6
I_S	128	16	301	10	152	-736	29	-45	0	82	-63
Mvh_otn	-2022	-228	-3284	-57	-255	**11818**	-194	-3064	5	-3030	-310
Eteq	-48	-4	725	5	-102	-2739	24	**2113**	1	-52	-77
Mnfcs	1172	17	1630	16	141	-4802	121	**1111**	-8	225	-378
Svces	1691	260	1332	131	290	-3114	138	-3274	20	3759	1234
Total	1158	90	1093	70	192	**-958**	-19	**-3575**	15	1935	0

Table 3-B Effect of ASEAN Korea FTA on Volume of Total Exports

(1997 $US million, evaluated at exporter market prices, Experiment 1)

To / From	1 USA	2 CAM	3 JPN	4 ANZ	5 CHN	6 SKOR	7 TWN	8 ASEAN	9 SAM	10 ROW	TOTAL
1 USA	0	342	76	76	216	918	42	-4094	46	1660	-717
2 CAM	-175	-9	7	2	17	102	1	-172	9	70	-146
3 JPN	1597	164	0	171	835	847	318	-6440	37	2263	-208
4 ANZ	20	5	79	27	43	107	33	-479	1	87	-75
5 CHN	-32	-4	23	5	181	203	6	-1165	4	130	-650
6 SKOR	-3066	-525	-1686	-389	-2688	0	-563	**20583**	-150	-7569	3947
7 TWN	184	19	66	15	334	-6	0	-956	4	202	-138
8 ASEAN	-1019	-215	-1398	-211	-600	**4632**	-190	**15120**	-21	-3076	13023
9 SAM	-6	-2	8	0	4	18	-1	-21	0	-10	-10
10 ROW	-164	-19	5	60	305	1529	20	-5562	38	2081	-1707
TOTAL	-2659	-243	-2820	-244	-1352	8350	-334	16814	-31	-4162	13319

Table 3-C Effect of Trade Liberalization on Welfare (ASEAN Korea FTA, Experiment 1)

	GDP Quantity Index (% of change)	Terms of Trade (% of change)	Per Capita Utility (% of change)	Welfare ($ US million)	Welfare Decomposition ($ US million)		
					Allocative Efficiency	Terms of Trade Improvement	Investment and Savings
USA	-0.001	-0.116	-0.018	-1293	-113	-982	-199
CAM	-0.003	-0.011	-0.007	-63	-26	-61	24
JPN	-0.005	-0.375	-0.049	**-1793**	-227	-1829	263
ANZ	-0.006	-0.140	-0.037	-152	-26	-125	-1
CHN	-0.017	-0.213	-0.094	**-833**	-170	-648	-14
SKOR	0.276	2.575	1.353	**5319**	**1236**	**4171**	**-88**
TWN	-0.008	-0.186	-0.084	-234	-24	-256	46
ASEAN	0.157	0.332	0.403	**2337**	**1025**	**1348**	**-37**
SAM	-0.004	-0.050	-0.016	-21	-6	-14	-1
ROW	-0.006	-0.047	-0.021	-2390	-727	-1670	7
TOTAL				878	943	-66	2

Table 3-D Effect of Trade Liberalization on Welfare (ASEAN Korea FTA, Experiment 2)

	GDP Quantity Index (% of change)	Terms of Trade (% of change)	Per Capita Utility (% of change)	Welfare ($ US million)	Welfare Decomposition ($ US million)		
					Allocative Efficiency	Terms of Trade Improvement	Investment and Savings
USA	-0.001	-0.116	-0.018	-1292	-114	-980	-199
CAM	-0.003	-0.011	-0.007	-63	-26	-61	24
JPN	-0.005	-0.375	-0.049	-1796	-228	-1831	263
ANZ	-0.006	-0.139	-0.037	-150	-26	-124	-1
CHN	-0.017	-0.212	-0.093	-830	-172	-644	-14
SKOR	0.277	2.574	1.353	**5319**	**1237**	**4170**	**-88**
TWN	-0.008	-0.186	-0.084	-234	-24	-256	46
ASEAN	0.149	0.331	0.393	**2278**	**971**	**1343**	**-37**
SAM	-0.004	-0.050	-0.016	-21	-6	-14	-1
ROW	-0.006	-0.047	-0.021	-2394	-731	-1670	7
TOTAL				818	882	-66	2

Table 4-A Effect of Trade Liberalization on Welfare (ASEAN China, ASEAN Japan FTA, Experiment 1)

	GDP Quantity Index (% of change)	Terms of Trade (% of change)	Per Capita Utility (% of change)	Welfare ($ US million)	Welfare Decomposition ($ US million)		
					Allocative Efficiency	Terms of Trade Improvement	Investment and Savings
USA	-0.004	-0.293	-0.044	-3178	-306	-2602	-269
CAM	-0.004	0.016	0.003	28	-45	12	61
JPN	0.039	0.289	0.082	**2987**	**1660**	**1616**	**-289**
ANZ	-0.012	-0.324	-0.082	-335	-53	-290	8
CHN	-0.005	0.223	0.078	**699**	**-52**	**650**	**101**
SKOR	-0.049	-0.551	-0.274	**-1075**	-220	-893	38
TWN	-0.030	-0.610	-0.277	-769	-90	-813	133
ASEAN	0.333	1.271	1.288	**7473**	**2179**	**5277**	**17**
SAM	-0.007	-0.110	-0.031	-39	-10	-28	-2
ROW	-0.010	-0.083	-0.036	-4023	-1249	-2977	203
TOTAL				1767	1814	-47	1

Table 4-B Effect of Trade Liberalization on Welfare (ASEAN China, ASEAN Japan FTA, Experiment 2.
Tariffs in the rice industry are maintained between ASEAN and Japan)

	GDP Quantity Index (% of change)	Terms of Trade (% of change)	Per Capita Utility (% of change)	Welfare ($ US million)	Welfare Decomposition ($ US million)		
					Allocative Efficiency	Terms of Trade Improvement	Investment and Savings
USA	-0.004	-0.289	-0.043	-3112	-294	-2584	-234
CAM	-0.004	0.017	0.003	32	-46	16	61
JPN	-0.022	0.459	0.031	**1130**	**-950**	**2437**	**-357**
ANZ	-0.012	-0.325	-0.082	-335	-55	-290	10
CHN	-0.008	0.229	0.078	**698**	**-81**	**669**	**109**
SKOR	-0.050	-0.553	-0.275	-1079	-225	-895	40
TWN	-0.031	-0.618	-0.281	-782	-93	-819	131
ASEAN	0.336	1.063	1.139	**6613**	**2196**	**4408**	**8**
SAM	-0.007	-0.116	-0.032	-41	-10	-30	-1
ROW	-0.010	-0.083	-0.035	-3933	-1213	-2953	233
TOTAL				-809	-770	-40	1

Table 5-A Change in Trade Balance (Korea China FTA, Experiment 1, $ US million)

	1 USA	2 CAM	3 JPN	4 ANZ	5 CHN	6 SKOR	7 TWN	8 ASEAN	9 SAM	10 ROW	Total
Rice	3	1	1	3	-45	3	0	22	0	10	-1
Farm	-2445	-294	-139	-458	**9901**	-5580	48	-328	-48	-1935	-1277
F_F	13	1	17	2	-64	-40	7	24	-3	31	-12
Mine	73	2	20	90	-123	-410	2	121	6	139	-79
Tex_wap	-139	-74	-900	-73	-3306	**6620**	-1159	-319	-5	-1232	-587
I_S	43	8	32	15	-165	-51	35	-1	0	33	-51
Mvh_otn	970	27	737	94	-799	-2479	162	32	9	1204	-42
Eteq	239	49	-19	10	**343**	-686	151	-163	2	83	7
Mnfcs	1354	203	325	201	-4913	**1567**	378	137	28	712	-7
Svces	1272	152	606	200	-1936	-2014	289	546	27	2907	2050
Total	1383	76	679	85	**-1107**	**-3069**	-87	71	16	1952	0

Table 5-B Effect of Korea China FTA on Volume of Total Exports

(1997 $US million, evaluated at exporter market prices, Experiment 1)

To / From	1 USA	2 CAM	3 JPN	4 ANZ	5 CHN	6 SKOR	7 TWN	8 ASEAN	9 SAM	10 ROW	TOTAL
1 USA	0	433	157	39	-598	-2048	10	249	36	1517	-204
2 CAM	294	-1	-9	-1	-61	-201	-4	7	7	83	114
3 JPN	581	43	0	51	-2271	284	72	413	16	850	39
4 ANZ	62	12	76	35	-29	-474	10	63	2	201	-44
5 CHN	-2074	-161	-1367	-152	**5528**	**16120**	-242	-776	-32	-3142	13700
6 SKOR	-1676	-292	13	-225	**17762**	0	-305	-1259	-89	-4136	9792
7 TWN	562	56	214	34	-1847	7	0	265	7	511	-190
8 ASEAN	187	19	124	7	-913	-431	30	210	2	397	-368
9 SAM	-1	0	-3	0	18	-34	-3	0	0	12	-12
10 ROW	-15	-44	-58	-46	-1676	-644	-95	103	18	1857	-601
TOTAL	-2081	65	-853	-259	15914	12578	-527	-726	-32	-1850	22228

Table 5-C Effect of Trade Liberalization on Welfare (Korea China FTA, Experiment 1)

	GDP Quantity Index (% of change)	Terms of Trade (% of change)	Per Capita Utility (% of change)	Welfare ($ US million)	Welfare Decomposition ($ US million)		
					Allocative Efficiency	Terms of Trade Improvement	Investment and Savings
USA	-0.001	-0.112	-0.017	-1207	-55	-1007	-145
CAM	-0.001	-0.004	-0.003	-30	-11	-30	11
JPN	-0.002	-0.097	-0.014	**-522**	-89	-494	61
ANZ	-0.004	-0.196	-0.048	-194	-17	-175	-2
CHN	0.017	0.652	0.251	**2239**	**170**	**1972**	**96**
SKOR	0.714	1.039	1.226	**4823**	**3184**	**1696**	**-57**
TWN	-0.014	-0.354	-0.160	-447	-41	-486	81
ASEAN	-0.020	-0.113	-0.104	**-602**	-130	-461	-11
SAM	-0.004	-0.075	-0.022	-28	-5	-21	-2
ROW	-0.003	-0.028	-0.013	-1485	-438	-1014	-33
TOTAL				2546	2567	-21	0

Table 5-D Effect of Trade Liberalization on Welfare (Korea China FTA, Experiment 2)

	GDP Quantity Index (% of change)	Terms of Trade (% of change)	Per Capita Utility (% of change)	Welfare ($ US million)	Welfare Decomposition ($ US million)		
					Allocative Efficiency	Terms of Trade Improvement	Investment and Savings
USA	-0.001	-0.112	-0.017	-1207	-55	-1007	-145
CAM	-0.001	-0.004	-0.003	-30	-11	-30	11
JPN	-0.002	-0.097	-0.014	-522	-89	-494	61
ANZ	-0.004	-0.196	-0.048	-194	-17	-175	-2
CHN	0.017	0.652	0.251	**2239**	**170**	**1972**	**96**
SKOR	0.714	1.039	1.226	**4821**	**3182**	**1696**	**-57**
TWN	-0.014	-0.354	-0.160	-447	-41	-486	81
ASEAN	-0.020	-0.113	-0.104	-602	-130	-461	-11
SAM	-0.004	-0.075	-0.022	-28	-5	-21	-2
ROW	-0.003	-0.028	-0.013	-1485	-438	-1014	-33
TOTAL				2545	2566	-21	0