Macroeconomic Effects of the East Asian FTA
—An Econometric Analysis—(*)

Table of Contents

(*) This paper is the revised version of the paper prepared and presented, with Toshio Inomata and Kenichi Matsuda (WEIS), at the workshop “Repercussions of the East Asia FTA on the Japanese and Chinese Economies”, which was held at JETRO-IDE on March 24, 2004. The author thanks Zhang Yunling (the Chinese Academy of Social Sciences), Zhang Bowei (Nankai University), Liu Xiangfeng (the State Commission of Economic Development and Reform, China), Hirokazu Okumura (JETRO), Fukunari Kimura (Keio University), Tomoo Marukawa (University of Tokyo) and others participants for helpful comments on earlier version of this paper.

1. Introduction

With Japan's negotiations for free trade agreements with the neighboring economies of Asia in progress, many attempts are being made to assess quantitative economic effects that can be expected from the agreements once they are concluded. Those of a free trade agreement with China are no exception. The fact, however, is that these analyses are not fully satisfactory for us. Among the many reasons for this, one key factor seems to be that the FTA contemplated today is something more than the conventional simple tariff reduction or the establishment of a free trade area, and embraces service industries, technological cooperation or foreign direct investment, which are outside the realm, or on a different dimensions from, arrangements that focus on conventional international trade in goods. This makes the conventional comparative static analysis insufficient to assess effects of these new types of agreement, requiring a comprehensive and dynamic analysis that embraces the economy, industry and trade. But we don't have analytical methods of general measurement of such dynamic effects that cover areas of difference dimensions.

What complicates the matter is that the overall situations in the future could differ greatly depending on which economies will implement the FTAs currently being negotiated, in advance of other economies. In other words, there is a game theoretical situation.

Under the circumstances, this paper focuses, as a primary approach to the questions, on the macroeconomic effects to be derived from changes in international trade in goods under a free trade agreement, and measures them quantitatively. It also aims to clarify the effects to be brought about on the economy by various alternatives through a simulation analysis.

2. The Preceding Studies

- Most of the quantitative assessments regarding East Asian FTAs or other FTAs employ the CGE model.
- Overall assessments of the effects of the FTA formation by the CGE model are summarized by Harrison et al.(2000) on the basis of numerous studies made in the past.
  - (1) Countries excluded from a Preferential Trade Arrangement (PTA) almost always lose.
  - (2) Market access is a key determinant of the net benefits of a PTA.

(3) With a Free Trade Agreement (FTA) the external tariff can be lowered such that a poor FTA becomes attractive.

(4) For Southern countries, North-South agreements offer a beneficial increase in competition in their home market, and involve little increase in the supply price of Northern country sales.

(5) Multilateral trade liberalization results in significantly larger gains to the world than the network of regional arrangements.

(6) For individual countries without high protection, “additive regionalism” will likely result in substantially larger gains than unilateral trade liberalization.

(7) Tax replacement requirements reduce the set of desirable regional arrangements.

(8) Trade taxes are often an inefficient source of tax revenue.

(9) Trade liberalization should be expected to be pro-poor in developing countries, but results will be diverse at the household level, so safety nets are important.

(10) We do not expect dynamic effects to reverse conclusions regarding regionalism.

- In reality, most of the quantitative evaluations of East Asian FTAs that depend on the CGE model are based on the GTAP model in effect.
- As examples of quantitative evaluation of East Asian FTAs that are based on the GTAP model can be cited Ma and Wang (2002), Tsutsumi and Kiyota (2000), and Tsutsumi and Kiyota(2002).
- Some limitations, however, are imposed on quantitative evaluations of East Asian FTAs based on the CGE model, making it necessary to have a alternative approach that complements the preceding studies in order to foresee results likely to occur in reality. As major limitations of the CGE are cited:
    (1) Essentially comparative static approach of the CGE model (neglect of time and costs for adjustment process in an economy).
    (2) Also, neglect of dynamic interdependent effects between economies in simulation.
    (3) Lack of political economy aspects.
    (4) Dependence on the characteristics of the GTAP model (key parameter values, database, etc.).
- In the conventional quantitative evaluations, assessment of intra-regional effects

of the FTA formation are tended to be stressed, presenting few assessments that include outside of the region and leaving unclear consequences that may ensue for the entire world.

- In this analysis, therefore, quantitative assessment is attempted on the basis of a macro econometric model, with the view to clarifying actual situations in (1) and (2) above.
- This assessment method is not without drawbacks, however. Criticisms commonly cited about the macro econometric model applied here, like a highly aggregate treatment of the economy, etc.
- Areas outside trade in goods, that is issues of (a) FDI, (b) service trade, (c) factor movements among others, are not considered explicitly here, leaving them as future research issues.

3. Tools of Analysis (Word Macro Econometric Model)

- As analytical tools of this research are used the JETRO-WEIS world econometric model and software system, which were developed jointly by the former JETRO and WEIS and expansion of the model and the system were made as required for this research to set files for simulation. The JETRO-WEIS world econometric model consists of 42 economies and regions. The models for the economies which are subject to an analysis in this report, such as the G7 economies, including Japan and the U.S., Asian NIEs 4, ASEAN 4 and China, consist of complete macro econometric models of approximately 100 and some mid-sized simultaneous equation systems based on the modified Keynesian theory. Each economy's macro model is linked by international trade (commodity trade) and designed to ensure, through simultaneous convergence solution, the values of both of each economy's macro and international trade variables to be consistent. Also, since the trade sector in this model is equipped with bilateral export-import functions for major economies, without employing solutions by means of world trade matrix usually used in multi-economy models of this kind, direct loading is possible when trade-related simulation is carried out. The world econometric model as a whole consists of some 1,500 structural equations, and some 7,000 definition equations, for a system of some 8,500 equations in total.

4. Outline of Baseline (No FTA, the status quo).

- The period for simulation is set to be from year of 2004 to 2010.

・ Major assumptions

Baseline is assumed on the following key premises (exogenous variables, etc.):

(1) Population: United Nations' population forecasts (mean value).

(2) Crude oil price and primary commodity prices: Based on IMF, IFS indexes (converted to 1990=100); IMF forecast figures for 2006, followed by a modest decline or a flat trend thereafter.

(3) World interest rate (the euro dollar rate as a proxy variable) linked to the rate of interest in U.S., rising slowly from 1.3% in 2003 to 3.4% in 2010.

(4) Each economy's foreign exchange rate (in floating exchange rate system) is determined by the relative purchasing power parity through 2010. The yen rate against US dollar will rise from 109 yen to 100 yen in 2010. The euro rate against US dollar remains generally stable.

(5) No major changes are assumed in each economic system and economic policy (Note that the foreign exchange rate systems of China and Hong Kong maintain the status quo).

[See table 1.]

・ The Summary of Baseline (the world economy through 2010)

(1) During the period of the simulation, the world economy expands at an annual average rate of 2.3% in real terms. The growth rate in the AME as a whole will be 2.2% (2.1% in the U.S., and 1.8% in Japan), per annum and that in the DME will be 4.9% (6.6% in China, 4.7% in the Asian NIEs, and 5.8% in the ASEAN4).

(2) The world inflation front remains stable, despite a slight rise, during the period; in the consumer price index, the world average will be 2.8% increase per annum. In AME, inflation rate will be 1.6%. As a result, the export price index for AME in terms of US Dollar will decline by 0.7% annually, while that for the world as a whole will drop by 0.8% during the period of simulation.

(3) World trade volume will grow by an annual average rate of 3.1% in nominal terms and 3.9% in real terms during the period.

5. Outline of Simulation Results (FTA Formation).

(a) Scenarios（Assumptions）.

・ Each economy's barriers (tariff) in commodity trade are assumed to be as given in

the accompanying table, and that the barriers are reduced to zero in the first year of simulation (2004) within the region of economies participating in the FTA, while they remain unchanged outside the region.

- Econometric model's point of view, the simulation can be interpreted as an once-for-all price shock for each economy.
- As for the relationship between China and Hong Kong, the CEPA was put into effect in January of 2004 as is known, with tariffs on the Chinese side scheduled to be abolished entirely in coming years. Given such prospects, now is in a transition period, with actual effective tariff rates unknown. Therefore, no change is assumed to be forthcoming in China-Hong Kong relationship as a result of the FTA formation,

Tariff barriers (Weighted average)

Economy	Year (actual)	Tariff rate
Japan	2002	2.2
China	2001	12.8
South Korea	2002	5.7
Taiwan	2002	3.3
Hong Kong	-	0.0
Singapore	-	0.0
Indonesia	2001	3.9
Malaysia	2001	4.6
Philippines	2002	2.8
Thailand	2001	8.7
(U.S.)	2002	2.6

Source: World Development Indicators 2004, World Bank

(b) Case 1: Japan-China FTA formation

- The conclusion of an FTA between Japan and China will create new additional trade (in what is called the trade creation effect), which will influence the income and price systems in the two economies, these changes in the respective economies will affect the economies of the rest of the world through international trade flow. This impact on the third economies is known as the so-called trade diversion effect that usually accompanies the FTA formation. There will also be response to macro-economic

changes in Japan and China through international trade, as well as influence on macro-economic changes between third economies. All these changes are obtained by convergence solutions of all the influences and effects caused by the influences, and by their quantitative expressions.

- As of the first year of the simulation (2004), Japan will score an additional exports of $1,670 million to China (in real terms, expressed in constant 1990 prices and exchange rates), while China will register $230 million in additional exports to Japan. Japan will also enjoy additional exports to markets other than China, bringing the total additional exports to $1,780 million, and a reduction in imports of $40 million, resulting in a net increase of $1,820 million in exports. Meanwhile, China will have additional exports of $250 million worldwide, and $1,590 million in additional imports, or a net increase in imports of $1,320 million.
- As for trade of other East Asian economies (Asian NIEs and ASEAN4) , all economies' exports to China will decrease. Exports to Japan will decrease for the Philippines and Indonesia, but other economies will see an increase, if not very large. As far as the whole world is concerned, exports will decline invariably, showing a trade reduction effect.
- To take the U.S, as an example of the third-economy effect, that US exports to every economy in East Asia, including Japan and China, will drop. Included here will be the diversion effect from the U.S. to Japan on the Chinese markets. On the other hand, imports into the U.S. from all the economies in the region, except Japan and China, will also decline, resulting in a net export reduction of $300 million.
- On balance, a net increase in trade of $1,380 million will occur for the world as a whole. To differentiate it from a la textbook effect of partial equilibrium and comparative static, these figures may be called **dynamic** trade creation and trade diversion effects, with the former amounting to $2,060 million and the latter, $680 million.

[See table 4 and table 5.]

- In the sixth year (2010) of the simulation on the effect of the FTA formation, Japan's exports both to China and to the entire world are set to increase (the cumulative rate of divergence from baseline reaching 3.93% and 0.32%, respectively in 2010), but imports are set to grow faster both from China (0.36%) and from the world (0.55%). As a result, Japan will maintain export surplus both with China and the world, but the divergence rate will shrink sharply, leading to a near disappearance of net

increase ($370 million). China, on the other hand, will record an increase in exports to Japan (3.36%) and in imports from Japan (3.93%), leaving a continuous import excess of $920 million, but both exports to the world (0.99%) and imports from the world (0.68%) will increase, leaving them almost in a balance, with a slight net export excess ($430 million).

- The impact on the entire world trade will be an increase in additional trade volume of $7,580 million (0.08%).

[See table 6 and table 7.]

- During this period (2004-2010), the impact on each economy, in terms of the average annual economic growth rate, will be stepped up 0.05%p for Japan and 0.03%p for China, as a result of a Japan-China FTA formation. Impact on Asian NIEs will be relatively large (0.02%p as a whole). Contribution to growth in Singapore (0.05%p), South Korea and Hong Kong (0.04%p, respectively) will be notable. On the other hand, impact on the ASEAN economies will be patchy. Indonesia and the Philippines will be affected negatively (-0.04%p), because their competitive conditions will become unfavorable on the Japanese and Chinese markets.
- Measured similarly in terms of the divergence rate from baseline with regard to each economy's GDP in 2010, Japan's will expand 0.38% and China's 0.06% as a result of the Japan-China FTA formation. Asian NIEs' will likewise expand 0.19%, with Singapore's 0.28%, South Korea's 0.23%, and Hong Kong's 0.23%. Indonesia's and the Philippines' will shrink 0.27%, respectively. As a result, GDP of the entire world will expand 0.07% in 2010.

[See table 2 and table 3.]

(c) Case 2: ASEAN＋3 FTA formation

- As in Case 1, the effect of mutual tariff reduction to zero under the FTA to be formed by ASEAN＋3 (the ASEAN4 and Japan, China and South Korea are direct objects here) is assessed. As in Case 1, no changes are assumed in economies outside the region. Unlike in Case 1, however, competitive conditions with third economies in import markets are not counted.
- Measured in terms of divergence rate in the first year of the simulation (2004), the effect for Japan will be an additional increase in both exports and imports—and

increase of $3,200 million (real value, expressed in constant 1990 prices and exchange rates) in exports ($2,990 million to within the region and $210 million to the rest of the world) and an increase of $720 million in imports ($610 million from within the region and $110 million from the rest of the world). In terms of the divergence rate, the export increase will be equal to 0.43% of Japan's total exports and the import increase will be equal to 0.24% of total imports.

- As for other member economies, all of them are to see their exports increase not only to economies within the region but also to the rest of the world economies. At the same time, imports of every economy will increase.
- The net difference between increases in exports and increases in imports varies from economy to economy. Japan, Singapore and Malaysia will see a net increase in their exports, but other member economies will see a net increase in imports. The economies categorized as "Other economies" (including EU, Latin Americas, etc) will also see a net increase in exports.
- As a result, an additional trade of $5,930 million will occur, equivalent to 0.08% of the world trade volume in 2004.

[See table 10 and table 11.]

- The likely impact of the formation of the ASEAN+3 FTA on changes in terms of growth rate for each economy in 2004 will be 0.11%p for Japan, 0.30%p for the Asian NIEs 4, 0.04%p for the ASEAN 4, and 0.01%p for China. Among the members, however, Hong Kong and Malaysia will see their growth rates decelerate due to increases in imports. The FTA will also work as an accelerating factor for outside economies. For the entire world, the impact will be to accelerate growth rate by 0.03%p.

[See table 8 and table 9.]

- Seen as a mid-term cumulative effect, the result of the simulation of the FTA formation in the seventh year (2010) will be for Japan an increase in its exports to the entire world by $9,550 million (a divergence rate from baseline at 1.00% in 2010) and an increase in its imports from the entire world by $3,290 million (1.01%), with a net increase of $6,660 million in export excess. The Asian NIEs4 will see their exports to the world jump by $7,580 million (0.64%) and the ASEAN4's increase in exports will be $1,640 million. China's will be $6,930 million (1.67%), with the

economy's cumulative rate of divergence from the baseline in export increases surpassing Japan's. China will also show a net export excess in its trade with the U.S. and "other economies," which are outside the region.

- As for the difference between exports and imports in increased trade, Japan and China will see large net export excesses, while South Korea and Thailand will see net import excesses. As a result, both NIEs4 and ASEAN4 as a whole will see net import excesses. The effect on the entire world trade will be an additional trade increase of $49.7billion.

[See table 12 and table 13.]

- The effect (divergence rate) of the ASEAN+3 FTA formation on each economy during this period (2004-2010) will be an accelerated economic growth rate in terms of average annual growth rate in every regional economy. That in turn will accelerate growth in economies outside the region. The acceleration will be 0.08%p for Japan, 0.10%p for China, 0.34% for Asian NIEs4, and 0.19%p for the ASEAN4. Growth effect will also be seen for the U.S., the EU, Middle East, Africa and Latin America.
- When the same thing is seen in terms of the divergence rate from baseline with regard to each economy's GDP in 2010, Japan's will expand by 0.56% and China's 0.56% thanks to the formation of the ASEAN+ 3 FTA. It will be a GDP expansion of 2.26% for the NIEs4 as a whole, 1.12% for the ASEAN4. As a result, the world's total GDP will expand by 0.35% in 2010.

[See table 8 and table 9]

6. Concluding Remarks

- This research confirms positive results to be brought about for the participating economies by the FTA formation.
- This research - the simulation result by the JETRO-WEIS world macro econometric model - also shows that the FTA formation's impact on each economy would be generally substantially larger than that of preceding studies by using the CGE model. Three reasons can be cited for the difference. Namely, compared with the latter, the former (1) focuses on short or medium-term effects, (2) grasps in explicit terms the influence of mutual interdependence that a macro-economic shock in one particular economy has not only on that economy itself but also on other economies,

including third economies, and (3) grasps explicitly the adjustment process over each economy's macro-economic shock in this interdependent world.

- Regarding the factor of (3), that is the difference in the adjustment speed over each economy's macro-economic shock, it is notable that this research suggests that the influence the FTA formation will have on the mid-term growth path largely differs from economy to economy.
- Also, regarding the factor of (2), that is the influence the FTA formation will have on economies which are not participating in the agreement, this research suggests that the influence could be positive in some cases, not necessarily resulting in one-sided damage caused by trade divergence and replacement shown in a comparative static analysis.
- This research also confirms that positive results will increase as a whole, even though each economy's gains and losses will become complex as more economies participate in the FTA. It confirms thus that the FTA is a second best alternative to the world free trading system.
- Lastly, this research limits its analysis to tariff barriers in trade in goods; it does not explicitly address the elimination of non-tariff barriers, service trade, or changes in foreign direct investment that may actually occur. If these factors were included as direct objects of analysis, the results would be more complex and change greatly. It is considered that, as an approach to these issues, a research based on a micro-economic approach will be compliment to this research, and it should become necessary, which is a matter for further study in the future.

References

Harrison, G. W., T. F. Rutherford, and D. G. Tarr. (2004) Rules of Thumb for Evaluating Preferential Trading Arrangements: Evidence from Computable Equilibrium Assessments. Mimeo. World Bank.

Ma, J. and Z. Wang. (2002) Options and Implications of Free Trade Arrangements in East Asia. Mimeo.

Tsutsumi, Masahiko and Kiyota, Kozo. (2000) *Economic Effects of Regional Economic Integration in Asia and Japan's Choice*, Japan Center for Economic Research. (in Japanese).

Tsutsumi, Masahiko and Kiyota, Kozo. (2002) *Economic Effects of Free Trade Agreements on Japan: Analysis by CGE Model*, JCER Discussion Paper No.74. Japan Center for Economic Research. (in Japanese).

Urata, Shujiro, Japan Center for Economic Research, ed.(2002). *Japan's FTA Strategies*. Nihon Keizai Shimbun, Inc.

World Bank. (2004). *World Development Indicators*. World Bank.

World Economic Information Services,(2004). *Summary of WEIS World Econometric Model*. WEIS. (in Japanese).

Tables

Tbl. 1 Main economic indicators

BASE	2004	2005	2006	2007	2008	2009	2010	2010/04
Crude Oil Average Price Index (1990=100)	136.9	125.1	114.0	124.0	120.2	116.4	112.9	
%	8.9	−8.6	−8.9	8.7	−3.0	−3.1	−3.1	−3.2
$／b	31.5	28.8	26.2	28.5	27.6	26.8	25.9	
Non-Fuel Primary Commodities Index (1990=100)	101.4	96.5	93.2	96.0	97.5	98.5	99.5	
%	7.3	−4.8	−3.4	3.0	1.6	1.0	1.0	−0.3
Export Price Index in AME (in terms of US$, 1990=100)	94.6	90.4	89.8	90.8	91.4	91.9	92.7	
%	4.5	−4.5	−0.7	1.2	0.6	0.6	0.9	−0.3
World Export Price Index (in terms of US$, 1990=100)	97.8	93.7	92.6	94.3	95.0	95.6	96.4	
%	4.8	−4.2	−1.1	1.8	0.7	0.7	0.9	−0.2
World Trade Amount (in current US$, Billion)	7,458	7,497	7,776	8,216	8,559	8,910	9,274	
%	9.6	0.5	3.7	5.7	4.2	4.1	4.1	3.7
World Trade Amount (in constant 1990 US$, Billion)	7,628	8,002	8,395	8,711	9,012	9,321	9,615	
%	4.5	4.9	4.9	3.8	3.5	3.4	3.2	3.9
Eurodollar Rate in London (three month deposit rate)	1.3	2.6	3.2	3.3	3.3	3.3	3.3	
Foreign Exchange Rate (Euro against US$)	0.826	0.898	0.870	0.862	0.862	0.861	0.857	
	−6.7	8.8	−3.1	−0.9	0.0	−0.2	−0.4	0.6
Foreign Exchange Rate (¥ against US$)	112	118	122	122	121	120	119	
	−3.4	5.2	3.8	−0.5	−0.8	−0.8	−0.7	1.0

Tbl. 2 Real GDP growth rate

Change from baseline＝(C1-BASE)

Unit: %p

	2004	2010	2010/04
World	0.00	0.01	0.01
Developed Market Economies	0.01	0.01	0.01
G7	0.02	0.01	0.01
U.S.	−0.01	0.01	0.00
Japan	0.10	0.03	0.05
EU	0.00	0.00	0.00
Other	0.00	0.01	0.00
Developing Market Economies	−0.03	0.02	0.01
Asia	−0.05	0.03	0.02
ANIEs4	−0.01	0.06	0.03
Korea	−0.01	0.08	0.04
Taiwan	0.00	0.02	0.02
Hong Kong	−0.01	0.08	0.04
Singapore	0.00	0.06	0.05
ASEAN4	−0.02	−0.02	−0.02
Indonesia	−0.05	−0.05	−0.04
Malaysia	0.00	0.02	0.01
Philippines	−0.02	−0.05	−0.04
Thailand	−0.01	0.01	0.00
China	−0.14	0.04	0.03
Other Asia	0.00	0.01	0.01
Middle East	0.00	0.01	0.01
Africa	0.00	0.00	0.00
Latin America	0.00	0.02	0.01
Europe	0.00	0.00	0.00

Tbl. 3 Real GDP

Deviation from baseline＝(C1-BASE)/BASE

Unit: %

	2004	2010
World	0.00	0.07
Developed Market Economies	0.01	0.07
G7	0.01	0.08
U.S.	−0.01	0.02
Japan	0.10	0.38
EU	0.00	0.01
Other	0.00	0.02
Developing Market Economies	−0.02	0.06
Asia	−0.05	0.07
ANIEs4	−0.01	0.19
Korea	−0.01	0.23
Taiwan	0.00	0.09
Hong Kong	−0.01	0.23
Singapore	0.00	0.28
ASEAN4	−0.02	−0.12
Indonesia	−0.05	−0.27
Malaysia	0.00	0.06
Philippines	−0.02	−0.27
Thailand	−0.01	0.00
China	−0.12	0.06
Other Asia	0.00	0.04
Middle East	0.00	0.03
Africa	0.00	0.01
Latin America	0.00	0.07
Europe	0.00	0.00

Tbl. 4 Trade matrix

Change from baseline＝(C1-BASE)
2004
Constant pirces and exchange rates at 1990

Unit: Mill.US Dollar

	Japan	U.S.	ANIES4					ASEAN4					China	World	ROW
				Korea	Taiwan	Hong Kong	Singapore		Thailand	Malaysia	Philippines	Indonesia			
Japan		10	10	-1	6	4	1	-2	0	3	-2	-3	1666	1780	96
U.S.	-265		-25	-4	-12	-6	-3	-10	-2	-2	-2	-4	-25	-353	-29
ANIES4	26	-20	-12	-3	-3	-4	-2	-17	-1	-1	-8	-7	-53	-89	-12
Korea	10	-5	-2		-3	1	0	-4	-1	0	-2	-1	-44	-50	-5
Taiwan	2	-10	-5	0		-3	-1	-6	-1	-1	-3	-2	0	-21	-2
Hong Kong	8	-3	-1	-1	0		-1	-1	0	0	-1	0	0	0	-2
Singapore	6	-2	-3	-2	1	-2		-6	0	0	-2	-4	-10	-18	-3
ASEAN4	-69	-8	-16	-3	-1	-2	-10	-11	-3	-3	-2	-4	-11	-124	-9
Thailand	1	-2	-2	-1	0	0	-1	-4		-1	-1	-3	-4	-13	-1
Malaysia	6	-1	-4	-1	-1	-1	-1	-2	-1		0	-1	-1	-4	-1
Philippines	-14	-2	-3	-1	0	-1	-1	-2	-1	-1		0	-1	-22	-1
Indonesia	-62	-4	-7	-1	0	0	-5	-3	-1	-1	-1		-5	-85	-5
China	227	6	17	1	0	15	0	0	0	0	0	0		277	26
World	-43	-53	-41	-15	-11	4	-19	-51	-8	-4	-16	-22	1592	1382	-22
Rest of the world	38	-41	-15	-5	-2	-3	-5	-11	-3	-1	-2	-5	15	-109	-94

Tbl. 5 Trade matrix

Deviation from baseline＝(C1-BASE)/BASE
2004
Constant pirces and exchange rates at 1990

単位:100万USドル　　単位:%

	Japan	U.S.	ANIES4	Korea	Taiwan	Hong Kong	Singapore	ASEAN4	Thailand	Malaysia	Philippines	Indonesia	China	World	ROW
Japan		0.01	0.01	0.00	0.02	0.01	0.00	0.00	0.00	0.02	−0.02	−0.03	3.49	0.30	0.04
U.S.	−0.48		−0.02	−0.01	−0.06	−0.01	−0.01	−0.03	−0.03	−0.01	−0.02	−0.12	−0.10	−0.04	0.00
ANIES4	0.04	−0.01	−0.01	−0.02	−0.01	−0.01	−0.01	−0.02	−0.01	0.00	−0.05	−0.06	−0.04	−0.01	0.00
Korea	0.03	−0.01	0.00		−0.02	0.01	0.00	−0.02	−0.02	0.00	−0.03	−0.02	−0.09	−0.02	−0.01
Taiwan	0.02	−0.04	−0.02	−0.01		−0.03	−0.02	−0.06	−0.03	−0.02	−0.11	−0.20	0.00	−0.02	−0.01
Hong Kong	0.05	−0.01	−0.01	−0.01	−0.01		−0.01	−0.01	0.00	0.00	−0.04	−0.02	0.00	0.00	0.00
Singapore	0.05	−0.01	−0.01	−0.03	0.01	−0.01		−0.01	0.00	0.00	−0.04	−0.09	−0.11	−0.01	0.00
ASEAN4	−0.16	−0.02	−0.02	−0.03	−0.01	−0.02	−0.03	−0.05	−0.04	−0.04	−0.05	−0.10	−0.07	−0.04	−0.01
Thailand	0.01	−0.01	−0.01	−0.04	0.00	−0.01	−0.02	−0.07		−0.02	−0.05	−0.20	−0.10	−0.02	0.00
Malaysia	0.05	0.00	−0.01	−0.02	−0.02	−0.02	−0.01	−0.02	−0.02		−0.02	−0.04	−0.02	0.00	0.00
Philippines	−0.27	−0.02	−0.04	−0.08	0.00	−0.03	−0.07	−0.08	−0.09	−0.07		−0.05	−0.04	−0.07	−0.02
Indonesia	−0.40	−0.04	−0.04	−0.02	0.00	−0.02	−0.08	−0.07	−0.09	−0.07	−0.08		−0.13	−0.12	−0.02
China	0.49	0.01	0.02	0.01	0.00	0.03	0.00	0.00	0.00	0.01	−0.01	−0.01		0.10	0.03
World	−0.01	0.00	−0.01	−0.01	−0.01	0.00	−0.01	−0.02	−0.01	0.00	−0.03	−0.05	0.49	0.02	0.00
Rest of the world	0.03	−0.01	−0.01	−0.01	0.00	0.00	−0.01	−0.01	−0.01	−0.01	−0.02	−0.03	0.01	0.00	0.00

Tbl. 6 Trade matrix

Change from baseline＝(C1-BASE)
2010
Constant pirces and exchange rates at 1990

Unit: Mill.US Dollar

	Japan	U.S.	ANIES4					ASEAN4					China	World	ROW
				Korea	Taiwan	Hong Kong	Singapore		Thailand	Malaysia	Philippines	Indonesia			
Japan		-374	-142	112	-48	-81	-125	-271	-59	-71	-75	-65	3158	2599	228
U.S.	-544		-381	94	-264	-178	-33	-124	-24	-11	-57	-32	15	-650	385
ANIES4	321	-185	-86	28	11	-103	-22	-126	-8	37	-69	-86	55	113	134
Korea	116	-102	46		-7	43	10	5	-7	11	-2	3	67	190	57
Taiwan	29	-34	-116	13		-106	-22	-76	-14	-13	-25	-25	0	-197	0
Hong Kong	100	-72	18	26	1		-10	-2	4	4	-11	1	3	103	56
Singapore	75	24	-34	-11	17	-40		-53	9	34	-31	-66	-15	16	20
ASEAN4	-144	-133	-218	-13	-4	-46	-155	-184	-48	-52	-36	-48	-7	-695	-10
Thailand	19	-19	-24	-2	4	-9	-18	-62		-11	-11	-40	-4	-87	3
Malaysia	60	10	-34	-1	-13	-24	4	-25	-12		-8	-5	0	22	12
Philippines	-96	-40	-43	-8	2	-11	-26	-32	-16	-13		-3	-6	-230	-12
Indonesia	-126	-83	-116	-2	2	-2	-115	-65	-20	-28	-17		3	-401	-13
China	2197	384	538	183	0	346	8	34	4	22	-1	8		3851	698
World	2235	341	-22	549	-285	-1	-285	-757	-149	-71	-266	-271	3426	7576	2353
Rest of the world	405	648	267	145	21	62	41	-85	-15	5	-27	-48	205	2358	917

Tbl. 7 Trade matrix

Deviation from baseline＝(C1-BASE)/BASE
2010
Constant pirces and exchange rates at 1990 Unit: %

	Japan	U.S.	ANIES4	Korea	Taiwan	Hong Kong	Singapore	ASEAN4	Thailand	Malaysia	Philippines	Indonesia	China	World	ROW
Japan		−0.20	−0.08	0.24	−0.10	−0.19	−0.36	−0.30	−0.19	−0.25	−0.42	−0.48	3.93	0.32	0.08
U.S.	−0.81		−0.23	0.23	−0.90	−0.27	−0.12	−0.25	−0.19	−0.06	−0.42	−0.58	0.04	−0.05	0.04
ANIES4	0.41	−0.09	−0.06	0.12	0.03	−0.16	−0.07	−0.10	−0.04	0.06	−0.31	−0.55	0.03	0.01	0.04
Korea	0.34	−0.15	0.09		−0.04	0.18	0.08	0.02	−0.11	0.12	−0.03	0.04	0.08	0.05	0.06
Taiwan	0.28	−0.10	−0.35	0.20		−0.56	−0.29	−0.45	−0.27	−0.19	−0.67	−1.58	0.00	−0.13	0.00
Hong Kong	0.54	−0.11	0.08	0.42	0.02		−0.12	−0.02	0.12	0.13	−0.28	0.09	0.00	0.03	0.05
Singapore	0.53	0.06	−0.08	−0.11	0.17	−0.19		−0.08	0.10	0.07	−0.43	−1.24	−0.11	0.01	0.02
ASEAN4	−0.30	−0.20	−0.23	−0.10	−0.03	−0.27	−0.32	−0.58	−0.45	−0.54	−0.58	−0.94	−0.03	−0.18	−0.01
Thailand	0.17	−0.10	−0.11	−0.07	0.12	−0.17	−0.16	−0.66		−0.23	−0.50	−1.77	−0.04	−0.08	0.01
Malaysia	0.49	0.04	−0.08	−0.02	−0.28	−0.33	0.01	−0.21	−0.16		−0.34	−0.20	0.00	0.02	0.03
Philippines	−1.27	−0.38	−0.45	−0.63	0.07	−0.56	−0.80	−0.85	−0.93	−0.79		−0.81	−0.22	−0.53	−0.13
Indonesia	−0.76	−0.88	−0.57	−0.04	0.07	−0.07	−1.28	−1.04	−1.23	−0.93	−1.04		0.05	−0.45	−0.04
China	3.36	0.46	0.60	0.81	0.00	0.58	0.12	0.21	0.13	0.36	−0.03	0.25		0.99	0.51
World	0.55	0.02	0.00	0.24	−0.15	0.00	−0.13	−0.18	−0.13	−0.05	−0.36	−0.41	0.68	0.08	0.04
Rest of the world	0.27	0.07	0.09	0.18	0.03	0.07	0.06	−0.09	−0.04	0.02	−0.25	−0.21	0.11	0.04	0.03

Tbl. 8 Real GDP growth rate

Deviation from baseline＝(C2-BASE)

Unit: %p

	2004	2010	2010/04
World	0.03	0.06	0.06
Developed Market Economies	0.02	0.04	0.03
G7	0.03	0.04	0.04
U.S.	0.01	0.05	0.04
Japan	0.11	0.06	0.08
EU	0.01	0.02	0.02
Other	0.01	0.03	0.02
Developing Market Economies	0.05	0.11	0.11
Asia	0.10	0.14	0.17
ANIEs4	0.30	0.28	0.34
Korea	0.56	0.50	0.63
Taiwan	0.06	0.01	0.03
Hong Kong	-0.06	0.05	0.03
Singapore	0.02	0.05	0.06
ASEAN4	0.04	0.16	0.19
Indonesia	0.06	0.10	0.10
Malaysia	-0.14	0.08	0.06
Philippines	0.01	0.08	0.06
Thailand	0.13	0.27	0.40
China	0.01	0.06	0.10
Other Asia	0.01	0.07	0.05
Middle East	0.01	0.05	0.04
Africa	0.00	0.03	0.02
Latin America	0.03	0.11	0.08
Europe	0.00	0.00	0.00

Tbl. 9 Real GDP

Deviation from baseline＝(C2-BASE)/BASE

Unit: %

	2004	2010
World	0.03	0.35
Developed Market Economies	0.02	0.22
G7	0.03	0.24
U.S.	0.01	0.23
Japan	0.11	0.56
EU	0.01	0.10
Other	0.01	0.16
Developing Market Economies	0.05	0.69
Asia	0.09	1.05
ANIEs4	0.28	2.26
Korea	0.53	4.22
Taiwan	0.06	0.23
Hong Kong	-0.06	0.12
Singapore	0.02	0.36
ASEAN4	0.04	1.12
Indonesia	0.06	0.65
Malaysia	-0.13	0.21
Philippines	0.01	0.35
Thailand	0.12	2.40
China	0.01	0.56
Other Asia	0.01	0.29
Middle East	0.01	0.22
Africa	0.00	0.09
Latin America	0.02	0.50
Europe	0.00	0.00

Tbl. 10 Trade matrix

Change from baseline＝(C2-BASE)
2004
Constant pirces and exchange rates at 1990

Unit: Mill.US Dollar

	Japan	U.S.	ANIES4					ASEAN4					China	World	ROW
				Korea	Taiwan	Hong Kong	Singapore		Thailand	Malaysia	Philippines	Indonesia			
Japan		29	397	340	33	7	17	1605	1440	115	50	1	989	3199	178
U.S.	23		164	136	16	3	9	−24	8	−42	9	1	−14	278	129
ANIES4	142	15	215	98	9	72	36	112	76	−12	19	30	149	749	117
Korea	112	4	86		4	64	17	107	60	17	0	29	2	409	98
Taiwan	10	1	57	46		5	6	1	2	−1	0	0	0	72	4
Hong Kong	12	7	30	13	4		13	1	2	−1	0	0	6	60	3
Singapore	8	2	42	39	1	3		3	12	−27	18	0	141	208	12
ASEAN4	15	1	112	50	3	3	57	12	4	−3	6	5	0	160	19
Thailand	5	0	22	6	1	1	14	4		−2	5	0	0	33	2
Malaysia	6	2	47	5	1	1	41	3	3		0	0	0	73	15
Philippines	0	−1	35	34	0	0	0	5	0	0		5	0	40	1
Indonesia	5	0	8	5	1	0	2	0	1	−1	0		0	15	1
China	453	59	129	87	0	11	31	1	3	−3	0	1		715	73
World	716	462	1251	922	73	92	163	1729	1557	41	88	43	1175	5930	597
Rest of the world	83	358	233	211	12	−4	13	21	26	−14	4	5	51	830	82

Tbl. 11 Trade matrix

Deviation from baseline＝(C2-BASE)/BASE
2004
Constant pirces and exchange rates at 1990 Unit: %

	Japan	U.S.	ANIES4					ASEAN4					China	World	ROW
				Korea	Taiwan	Hong Kong	Singapore		Thailand	Malaysia	Philippines	Indonesia			
Japan		0.01	0.30	1.03	0.10	0.02	0.06	3.35	6.94	0.67	1.25	0.01	1.40	0.43	0.08
U.S.	0.04		0.18	0.49	0.07	0.02	0.04	−0.10	0.10	−0.47	0.23	0.02	−0.06	0.03	0.02
ANIES4	0.32	0.01	0.21	0.97	0.06	0.12	0.18	0.17	0.42	−0.04	0.23	0.38	0.09	0.09	0.04
Korea	0.61	0.01	0.26		0.07	0.33	0.23	1.01	2.00	0.58	0.02	1.02	0.01	0.20	0.13
Taiwan	0.10	0.00	0.17	1.76		0.02	0.10	0.01	0.06	−0.02	0.02	0.02	0.00	0.05	0.01
Hong Kong	0.15	0.01	0.22	0.27	0.22		0.18	0.02	0.07	−0.03	0.02	0.01	0.00	0.02	0.00
Singapore	0.10	0.00	0.18	1.41	0.01	0.02		0.01	0.13	−0.14	0.84	0.00	2.14	0.11	0.02
ASEAN4	0.04	0.00	0.17	0.61	0.03	0.01	0.18	0.10	0.07	−0.07	0.40	0.38	0.00	0.06	0.02
Thailand	0.04	0.00	0.15	0.61	0.08	0.01	0.22	0.17		−0.13	1.30	0.05	0.00	0.04	0.01
Malaysia	0.07	0.01	0.14	0.18	0.01	0.01	0.21	0.05	0.06		0.01	0.03	0.00	0.07	0.05
Philippines	0.03	−0.01	1.27	8.82	0.03	0.02	0.06	0.84	0.07	−0.08		4.14	0.01	0.16	0.01
Indonesia	0.03	0.00	0.05	0.12	0.02	0.02	0.03	0.01	0.07	−0.03	0.01		0.01	0.02	0.00
China	2.16	0.06	0.15	0.80	0.00	0.02	0.42	0.02	0.13	−0.15	0.01	0.07		0.23	0.07
World	0.24	0.03	0.17	0.62	0.06	0.03	0.10	0.77	1.99	0.05	0.33	0.11	0.31	0.08	0.01
Rest of the world	0.06	0.04	0.10	0.35	0.03	0.00	0.02	0.03	0.11	−0.07	0.05	0.03	0.05	0.02	0.00

Tbl. 12 Trade matrix

Change from baseline＝(C2-BASE)
2010
Constant pirces and exchange rates at 1990

Unit: Mill.US Dollar

	Japan	U.S.	ANIES4					ASEAN4					China	World	ROW
				Korea	Taiwan	Hong Kong	Singapore		Thailand	Malaysia	Philippines	Indonesia			
Japan		686	2875	2450	109	165	151	3088	2760	167	138	22	2302	9952	1002
U.S.	299		1923	1657	64	91	111	580	463	0	99	19	40	6185	3342
ANIES4	613	1386	1526	729	76	539	182	1095	791	123	78	102	1552	7581	1408
Korea	344	791	420		21	318	80	363	215	51	12	86	142	2744	684
Taiwan	91	147	464	287		139	39	151	121	3	16	12	0	992	139
Hong Kong	98	299	369	266	40		63	109	89	1	18	1	1256	2523	391
Singapore	81	150	272	176	15	81		471	366	69	33	3	154	1322	194
ASEAN4	200	153	794	372	29	157	236	147	114	7	11	16	73	1643	277
Thailand	96	39	169	64	7	40	59	13		5	7	2	21	409	70
Malaysia	44	93	336	73	11	95	157	90	80		2	8	28	721	131
Philippines	5	5	167	161	2	7	−3	15	8	0		6	2	202	9
Indonesia	55	17	123	75	10	14	24	29	25	1	2		22	311	66
China	1553	1648	1792	926	0	362	504	129	106	7	1	14		6929	1808
World	3292	9027	12842	8971	390	2069	1412	6070	5115	349	329	276	4921	49734	13583
Rest of the world	626	5154	3931	2837	111	755	228	1032	881	45	2	104	954	17444	5746

Tbl. 13 Trade matrix

Deviation from baseline＝(C2-BASE)/BASE
2010
Constant pirces and exchange rates at 1990 Unit: %

	Japan	U.S.	ANIES4					ASEAN4					China	World	ROW
				Korea	Taiwan	Hong Kong	Singapore		Thailand	Malaysia	Philippines	Indonesia			
Japan		0.21	1.64	5.59	0.25	0.34	0.39	3.93	7.06	0.63	2.49	0.31	2.01	1.00	0.34
U.S.	0.47		1.52	4.36	0.22	0.32	0.36	1.51	3.12	0.00	1.70	0.45	0.10	0.49	0.34
ANIES4	1.22	0.56	1.06	5.31	0.39	0.65	0.65	1.13	2.79	0.27	0.66	1.02	0.57	0.64	0.38
Korea	1.67	1.30	0.93		0.29	1.16	0.79	2.30	4.57	1.14	0.49	2.05	0.61	1.04	0.70
Taiwan	0.83	0.29	0.96	7.81		0.38	0.47	0.75	2.25	0.03	0.52	0.46	0.00	0.53	0.25
Hong Kong	1.06	0.37	2.02	4.01	1.87		0.67	0.95	2.40	0.04	0.52	0.15	0.52	0.51	0.30
Singapore	0.83	0.27	0.84	5.15	0.15	0.43		0.95	2.52	0.23	1.08	0.13	1.59	0.53	0.21
ASEAN4	0.45	0.16	0.81	3.59	0.23	0.51	0.54	0.87	1.49	0.12	0.59	0.87	0.46	0.42	0.22
Thailand	0.55	0.10	0.78	4.68	0.28	0.40	0.72	0.43		0.22	1.10	0.53	0.42	0.31	0.16
Malaysia	0.51	0.38	0.64	2.27	0.19	0.58	0.58	1.18	1.43		0.26	0.58	0.53	0.52	0.31
Philippines	0.27	0.02	3.88	16.55	0.22	0.45	−0.46	1.88	2.26	0.15		4.72	0.48	0.54	0.11
Indonesia	0.34	0.17	0.62	1.55	0.25	0.45	0.32	0.54	1.55	0.05	0.38		0.42	0.36	0.21
China	6.39	1.36	1.49	5.62	0.00	0.39	4.58	1.36	2.59	0.23	0.34	0.74		1.67	1.29
World	1.01	0.49	1.30	4.53	0.24	0.52	0.63	1.81	3.93	0.28	0.98	0.58	0.81	0.52	0.25
Rest of the world	0.44	0.50	1.23	3.75	0.20	0.65	0.32	1.09	2.43	0.16	0.03	0.46	0.58	0.33	0.16