Chapter I

Deepening Economic Interdependence in the APEC Region

－Boom and Vulnerability through Trade Linkages－

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1. Introduction

The developing economies in East Asia have grown remarkably since the sharp yen appreciation in 1985, and it happened alongside the formation of strong economic linkages in the region.

The yen appreciation induced the export surge of the Asian NIEs and the increase in Japanese foreign direct investments (FDI) in the ASEAN countries to cope with the emerging NIEs' exports. A few years later, the NIEs themselves increased their FDI in the face of waning export competitiveness caused by the currency appreciation and wage increase after the export boom. Not only the ASEAN countries but also China and Vietnam became the destination of the investments this time. Open economic systems in China and Vietnam were gaining popularity. The growth of the East Asian developing economies from 1985 to 1995 was often characterized by the rapid increase of trade and investments. As a result, the region's producers have become woven into the international production network, and this phenomenon can be observed through the increase in intra-industry trade and cross boundary intra-firm trade.

In addition to the unilateral liberalization in the age of globalization, policies move in the 1990's have moved to strengthen regional schemes, hoping to maintain the so-called "Asian

growth dynamism." APEC and AFTA increased their impetus.

Table 1. Trade Dependency Ratio

(E: export/GDP, M: import/GDP) (%)

	Korea		Taiwan		Hong Kong		Singapore		Thailand		Malaysia	
	E	M	E	M	E	M	E	M	E	M	E	M
1985	34.1	32.8	54.2	40.4	88.3	86.9	128.9	148.5	23.2	25.9	54.9	49.8
1986	37.6	31.7	58.1	38.3	88.9	88.7	124.7	141.5	25.6	23.6	56.3	50.2
1987	40.2	32.4	57.3	40.0	97.6	97.6	138.3	157.0	28.9	28.3	63.8	49.7
1988	38.4	30.5	54.3	43.6	107.3	108.5	153.5	171.3	33.0	34.4	67.3	56.9
1989	32.7	30.0	49.6	42.1	108.8	107.3	147.1	163.6	34.9	37.5	73.1	66.9
1990	29.8	30.3	46.8	41.8	108.6	109.1	140.6	162.2	34.1	41.6	76.4	74.3
1991	28.2	30.6	47.4	42.9	114.7	116.6	135.6	152.0	35.3	42.4	81.0	84.8
1992	28.9	30.3	43.4	41.3	118.4	122.3	127.7	145.2	36.5	40.8	76.9	75.5
1993	29.3	28.8	44.2	42.3	118.4	121.4	126.8	146.0	37.2	41.5	80.2	82.1
1994	30.1	30.8	44.1	42.2	116.3	124.3	135.8	144.1	39.0	43.8	91.3	92.9
1995	33.1	34.1	48.8	46.8	125.5	139.2	138.3	144.8	41.1	48.0	136.6	99.2

	Philippines		Indonesia		China		Japan		USA	
	E	M	E	M	E	M	E	M	E	M
1985	24.0	21.9	22.2	20.4	9.0	13.8	14.5	11.1	7.2	10.0
1986	26.3	22.4	19.5	20.5	10.5	14.5	11.4	7.4	7.2	10.2
1987	26.5	26.2	23.9	22.4	12.3	13.4	10.4	7.2	7.8	10.8
1988	28.3	26.9	23.8	21.1	11.8	13.8	10.0	7.8	8.9	11.0
1989	28.1	30.3	24.3	21.4	11.7	13.2	10.6	9.2	9.4	10.8
1990	27.5	33.2	25.3	23.7	16.0	13.8	10.7	10.0	9.7	10.9
1991	29.6	32.5	25.5	24.1	17.7	15.7	10.2	8.4	10.2	10.5
1992	29.1	34.0	27.9	25.0	17.6	16.7	10.0	7.7	10.2	10.7
1993	31.3	39.8	26.8	23.8	15.3	17.3	9.3	7.0	10.1	11.1
1994	33.8	40.1	26.3	24.0	22.3	21.3	9.3	7.2	10.4	11.8
1995	36.4	44.2	26.4	25.2	21.2	18.9	9.4	7.9	11.1	12.5

Data Sources:
ADB, *Key Indicators;*
IMF, *International Financial Statistics Yearbook;*
US Census Bureau, *Statistical Abstract of United States;*
Management and Coordination Agency, Japan, *Japan Statistical Yearbook.*

Deepening regional economic interdependence is easily observable from the figures. **Table 1** shows the export and import dependency ratios (percentage of exports or imports to GDP) of Asian NIEs, the core ASEAN countries, and China. The figures for Japan and the USA are cited as a reference. The absolute level of the figures is high in Hong Kong, Singapore and Malaysia. It is not much of a wonder that the first two have high ratios since they are small open economies with heavy engagement in transit trade. Transit trade is

especially increasing in Hong Kong along with the growth of China. Malaysia's trade dependency almost doubled between 1985 and 1995. Thailand, the Philippines, and China clearly show trends of increasing trade dependency. The absolute levels of the dependency ratios for these countries are much higher than those of Japan and the USA. Ironically, the ratios for Korea and Taiwan, known for their export led growth strategy, showed mixed movements. Their export dependency ratios went up in the late 1980's, and the ratio decreased after their economies entered the period of stable growth. However, signs indicate the ratio has picked up in the recent years. Finally, the contrast between Japan and the USA should be pointed out. Japan kept decreasing its dependency on exports while the USA moved in the other direction, and in 1995, the US economy has more dependent on exports than the Japanese economy.

The increase in export dependency ratios was closely related to the increase in FDI. This is a reasonable consequence because, in many cases, FDI was export oriented both to the third countries and to the home (investing) countries. FDI impacts economies much more than just acting as a suppler of capital and production know-how. FDI operations also inspire indigenous firms with demonstration effects.

Table 2. Proportion of FDI Net Inflow to Total Investment

(%)

	Korea	Taiwan	Singapore	Thailand	Malaysia	Philippines	Indonesia	China
1985	0.93	2.18	10.82	1.50	7.46	0.97	1.54	1.15
1986	1.56	1.91	23.55	2.35	6.69	3.07	1.34	1.59
1987	1.58	0.06	38.45	1.30	5.83	6.65	2.04	1.66
1988	1.71	-12.33	45.43	5.74	8.59	14.60	2.53	1.89
1989	0.61	-16.25	20.67	6.92	15.03	6.33	2.53	2.27
1990	-0.11	-10.90	29.74	6.97	16.83	5.16	3.37	2.69
1991	-0.21	-1.47	0.03	3.46	23.81	5.81	4.28	3.09
1992	-0.44	-2.01	-5.02	3.52	24.68	6.11	4.96	4.75
1993	-0.45	-2.91	13.07	2.79	20.34	6.69	4.82	10.26
1994	-0.97	-1.96	19.24	1.58	14.93	8.51	4.32	16.26
1995	-1.13	-1.87	14.87	1.63	10.98	8.27	6.52	13.92

Data Sources:
ADB, *Key Indicators;*
IMF, *International Financial Statistics Yearbook;*
US Census Bureau, *Statistical Abstract of United States;*
Management and Coordination Agency, Japan, *Japan Statistical Yearbook.*

Table 2 indicates how important the FDI was as a supplier of capital in the Asian developing economies. The figures show each economy's proportion of FDI inflow to total gross fixed capital formation. Taiwan and Korea have shifted to net investors in the late 1980's. Investments from Singapore to its neighbors and China have increased, but FDI inflow still exceeds outflow because of Singapore's important position as a regional business, service, and financial center. Thailand's and Malaysia's proportions of FDI peaked around 1990 and declined afterwards. Thailand experienced a mini bubble economy, but its share of FDI never went up to 10%. Meanwhile, the share in Malaysia's proportion remained quite high which relates to the high export dependency mentioned above. The investment destination changed in the 1990s from Thailand and Malaysia to China, Indonesia, and the Philippines where the proportions of FDI to investments increased. It should not be overlooked that FDI to China has drastically increased in 1993 and continues to occupy more than 10% of its investment. China devalued its currency in 1993.

The rapid growth of the East Asian economies, where countries experienced rapid growth in turn, has suddenly come to a halt in 1997. There were few signs of disruption to this growth. Fundamental variables appeared generally normal except for the sudden slowdown of exports and increased trade deficit in 1995. The Thai currency had been overvalued due to the *de facto* peg of the baht to the US dollar. The problem basically came from the financial sector. Since the attack on Thai baht in July 1997, the currency crises diffused to the regional economies severely hit Korea and Indonesia. As a result, we come to realize that the financial interdependence in the region had proceeded more deeply than we noticed. Not only FDI, but also portfolio investments, and bank loans financed the rapid growth. Since the late 1980's, ASEAN countries have eased their foreign exchange control and liberalized the banking sector to diversify the source of investment funding. When international markets start to question the heavy dependence on short-term foreign money, exchange rate will most certainly fluctuate.

Table 3 indicates the financial dependence. Since readily available statistics are limited to the net portfolio investments in the balance of payment statistics, the cumulative amount of net portfolio inflow since 1985 was compared with total money supply (M2).

Taiwan and Singapore are net investors. Meanwhile, Korea has experienced large inflows in 1993 due to financial liberalization progress. Korea's M2 share was as large as 20% in 1995. In Thailand, the figure clearly increased since 1993 after the relaxation of foreign exchange control and the opening of the offshore market. In 1990, Thailand's proportion reached almost 10%. Indonesia was rather late in this area, but its recent pace of increase was rapid, and the figure went up to 7% in 1995. In Malaysia, after a period of net outflow continued until 1992, inflow started to increase rapidly. It is not a coincidence that countries severely hit by the currency crisis had higher shares of cumulative portfolio investments. Portfolio investments could move quickly in case of an incident. The proportion of net portfolio inflow is directly linked to uncertainty in the monetary system and the foreign exchange regime.

Table 3. Proportion of Cumulative Portfolio Investment to Money Supply (M2)

(%)

	Korea	Taiwan	Singapore	Thailand	Malaysia	Philippines	Indonesia	China
1985	3.01	-0.07	0.01	0.65	4.96	-0.48	-0.17	1.83
1986	3.59	0.03	-0.03	0.93	8.42	-0.56	1.03	2.26
1987	3.71	-0.26	-0.01	2.34	3.58	-0.96	0.65	2.29
1988	3.32	-1.20	-0.02	3.13	-4.49	-0.77	0.15	2.24
1989	2.74	-1.38	-0.02	5.56	-6.44	1.84	-0.41	1.83
1990	3.17	-1.71	-0.05	5.14	-9.08	1.35	-0.50	1.34
1991	5.40	-1.42	-0.06	4.34	-8.75	2.32	-0.47	1.12
1992	9.35	-0.99	-0.01	4.38	-9.32	2.36	1.50	0.85
1993	15.69	-0.62	-0.10	7.85	-7.01	1.71	2.83	1.10
1994	17.33	-0.34	-0.25	8.44	-5.93	2.49	3.80	1.45
1995	19.26	-0.21	-0.35	9.65	-1.64	2.78	7.24	1.23

Note: Portfolio investment is a cumulative of net flow since 1985.

Data Sources:

ADB, *Key Indicators;*
IMF, *International Financial Statistics Yearbook;*
US Census Bureau, *Statistical Abstract of United States;*
Management and Coordination Agency, Japan, *Japan Statistical Yearbook.*

In short, since 1995, East Asian countries have deepened economic interdependence through trade, FDI, and other financial flow. With the progress of such interdependence, economies in the region need to pay more careful attention to other economies' moves or incidents. To a certain extent, increased chances for an economic boom come along with increased vulnerability. Once a boom or a disruption happens to an outside country, the next

question is, "How much will it impact the domestic economy?"

This present paper tries to address this question quantitatively in the area of trade, where data is relatively abundant. It covers, Japan, the USA, China, Asian NIEs (Korea, Taiwan, Hong Kong, and Singapore), and the ASEAN four (The Philippines, Thailand, Malaysia, and Indonesia). The period covered is basically the 11 years from 1985 to 1995. Since many countries and variables are used, even the unsatisfactory regression results had to be used in some cases to maintain the analytical framework. In this sense, the quantitative estimates in the following sections should be regarded as preliminary.

The second section will measure the degree of external shock to an economy. It breaks down the factors affecting the degree of fluctuation into export instability and the degree of sensitivity represented by the open Keynesian multiplier. The third section will measure the interregional income multiplier. It shows the totals of both direct and indirect effects generated by an independent increase in investments. Increased investment will directly impact an economy, and then it will increase the income of other economies through trade. Moreover, the income increase in other economies will again induce increased exports for the original economy. In this way, the repercussions continue until the impact becomes zero. The section tries to measure the total impact for each economy with a reasonable break down of the impacts. The paper will conclude with remarks.

2. Export Fluctuations and Their Impact on a Domestic Economy

In the very simple Keynesian open system, incremental changes of income are generated by incremental changes of independent variables such as investments and exports, and the degree of income change depends on the structural parameters. In the conventional form, the relation is expressed as;

$$\Delta Y = 1 / (1- c + m) \ * \ (\Delta I + \Delta E) ,$$

where, Y , E , and I denote income (or GDP), exports, and imports respectively. c and m

are parameters which show marginal propensity to consume and marginal propensity to import. In the world of globalization, it is of interest to know the fluctuations generated by external factors. Therefore, export fluctuations between 1985 and 1996 will be examined first, and then the Keynesian multiplier, 1/(1-c+m), will be estimated to determine the sensitivity of each economy to external shocks.

2-1. Export Fluctuations

The estimation period was divided into 1985-90 and 1991-96 to see the change in the degree of fluctuations between the periods. The export data were obtained from each country's national accounts at the respective year's constant prices. In the cases of Hong Kong and Singapore, where the national accounts give only net exports, trade data were used and deflated by the unit export price indices. The same treatment was given to China's data because the export data at constant prices were not available from its national account series. Because the unit price index of China was unavailable for some years, the indices for the lacking years were estimated by using the time series method and assuming an auto-regressive process of a degree of one.

Measuring the degree of fluctuation for variables with an increasing trend is problematic. The standard deviation measure is not a good index because the figure becomes large if the trend is steep. GDP also can not serve as a trend because it is dependent on export fluctuations. Therefore, a simple linear time trend was applied. Still, if a series of data actually follow the exponential trend, applying the linear trend results in the exaggeration of the degree of fluctuations. The figures in **Table 4** show the percentage of fluctuation of exports unexplained by the time trend. In a more straightforward expression, it is given as 1 minus adjusted R-squared, obtained from the regression with constant term.

Japan's export fluctuation was greater in the earlier period, but it became quite stable in the latter period. China's exports and Hong Kong's domestic exports had high fluctuations. Indonesia, Taiwan, and Korea had more stable exports after 1991 compared with the earlier period. Meanwhile, China, Singapore, and Malaysia showed the opposite tendency.

Table 4. Degree of Real Export Fluctuations around the Trend

(%)

	1985-90	1991-96
Japan	47.0	2.6
USA	1.8	5.1
China	23.3	27.6
Korea	21.8	6.2
Hong Kong		
Total exports	2.3	2.0
Domestic exports	30.0	26.1
Taiwan	16.6	3.6
Singapore		
Total exports	3.2	6.8
Domestic exports	1.9	6.3
Indonesia	15.4	1.7
Thailand	2.1	2.0
Malaysia	3.6	4.6
Philippines	3.5	10.0

Notes:

1) The second period of China covers 1991-95.
2) The export figures were obtained from national accounts at each country's constant prices. However, as for Hong Kong and Singapore, the figures were obtained from trade statistics.
3) The degree of fluctuation was measured by the following formula after regressing the export data to time trend with a constant term.

(1 - adjusted R-squared) x 100%

Therefore, the figures shows the percentage of fluctuations unexplained by the time trend. The figure ranges between 100% and 0%.

Data Sources:

ADB, *Key Indicators;*
IMF, *International Financial Statistics Yearbook;*
US Census Bureau, *Statistical Abstract of United States;*
Management and Coordination Agency, Japan, *Japan Statistical Yearbook.*

We may now conclude that most of the East Asian countries experienced stronger export fluctuations in the late 1980's, and the fluctuations stabilized in the 1990's. Only China and the Philippines had stronger export fluctuations in the more recent years. This implies that the 1990's had more stability in East Asia.

2-2. A Domestic Economy's Sensitivity to External Shocks

The Keynesian multiplier under the open system was measured for each economy as an indicator of sensitivity to external shocks. To get the parameters *c* and *m*, consumption

functions and import functions were estimated. Using the sample period 1985 to 1995, **Appendices 1 and 2** summarize the estimated results of each equation. All the data were first obtained at each country's constant prices at a certain base year. These data were mechanically converted to 1995 constant prices and then converted to billion US dollars at the 1995 exchange rate. So, all the data are given at 1995 constant US billion dollars. However, this is not completely rigorous because of the mechanical change of the base year. The consumption data equals the sum of private and government consumption, except for the USA where government consumption data are not separable from government investments.

In the standard specification, imports were regressed to GDP, relative price of the import deflator to GDP deflator. Using the specification without a relative price would distort the estimated coefficient of GDP. When a serial correlation appeared in the estimation, the auto-regressive process of degree one, AR(1), was assumed and corrected. For some countries, distortion still remains a problem, and the AR(1) did not work. Year dummies were also applied when necessary. More than half of the equations had a negative constant term. Theoretically, these should be positive. However, it is very difficult to have a positive estimate for the constant term because imports increased rapidly during the period. The imports increased not only for consumption goods, but also capital goods, and intermediate goods. In other words, countries had a much larger marginal propensity to import in a high growth period. Adding an investment variable into the group of explanatory variables might solve the problem, but that was not done because we need to define the MPS against GDP. Therefore, the results should be interpreted, keeping in mind that the multiplier reflects the feature of the rapid growth during the period.

The estimate for the marginal propensity to consume (MPC) ranged between 0.4 and 1. Singapore, which has special a savings scheme called the central provident fund, had the lowest MPC. In many economies, the figures were relatively low, which reflects the high investment ratios during the period. The figure for the Philippines might be too high.

The estimate of the marginal propensity to import (MPM) varied greatly among the economies. Due to the above stated reason, the figure is extraordinarily high in countries such as Hong Kong, Malaysia, Singapore, and the Philippines. The leakage of growth to

other economies through trade is quite large in those economies. The magnitude could be overestimated, but the relative position of each economy is consistent with the import dependency ratio (average propensity to import) figures.

Consequently, the multiplier was highest for the USA at 2.17. Indonesia, Japan, China, Korea, and Taiwan show a normal figure of more than one. In other countries, the multiplier was less than one. This means that 1 unit of investment increase in Thailand will increase its GDP by 0.952 unit. The leakage of the initial impact to import is large. Therefore, in such countries, the rapid investment growth easily leads to a trade deficit. Actually, such trade deficit had increased, but it did not cause a serious balance of payment problem because FDI and portfolio investments financed the trade deficits.

Table 5. Keynesian Multipliers

	MPC	MPM	Multiplier	Import dependency ratio in 1995 (%)
Japan	0.620	0.293	1.486	7.9
USA	0.698	0.159	2.169	12.5
China	0.538	0.264	1.377	18.9
Korea	0.634	0.407	1.295	34.1
Hong Kong	0.824	2.724	0.345	139.2
Taiwan	0.831	0.577	1.341	46.8
Singapore	0.405	1.528	0.471	144.8
Indonesia	0.660	0.285	1.600	25.2
Thailand	0.590	0.641	0.952	48.0
Malaysia	0.572	1.419	0.541	99.2
Philippines	0.988	1.367	0.725	44.2

Note: MPC: marginal propensity to consume
MPM: marginal propensity to import
Multiplier: 1/(1-MPC+MPM)
Sources: Appendix 1 and 2

In summary, the increasing interdependence made the multiplier of each developing economy smaller. The more liberalized the economy is, the lower the multiplier is. The figures for Indonesia, Thailand, and Malaysia are good examples. If countries do not coordinate policies, macro control of an economy becomes ever more difficult in the days of strong economic interdependence.

Table 6 is a digression that shows how each economy's imports responded to the relative price. This is a part of the MPM estimation results. It is quite reasonable that the

US imports are strongly price responsive. China, Taiwan, Singapore and Indonesia were also responsive. Japan's experience shows that the relative price change was an important reason for some commodities in the late 1980's, but, it probably was not captured by the estimation because of the J curve effects and the sluggish economy in the 1990's.

Table 6. Response of Imports to Relative Price Change

	respond?	coefficient
Japan	no	
USA	yes	-922
China	yes	-106
Korea	no	
Hong Kong	no	
Taiwan	yes	-18
Singapore	yes	-31
Indonesia	yes	-25
Thailand	no	
Malaysia	no	
Philippines	no	

Note: The coefficient is obtained from the estimation of the import function with GDP and relative price as explanatory variables. The relative price is defined as import deflator over GDP deflator. The magnitude of the coefficient shows the strength of response, but it is not price elasticity. When the coefficient of the relative is not significant, respond is "no" in the table.
Source: Appendix 1 and 2

3. Interregional Multiplier Effects through Trade Linkages

The rapid growth of East Asian economies was not brought about simply by the interregional adjustment of the industrial structure that originated from the yen appreciation. Increasing import demands of the booming Japanese economy in the late 1980's and the continuous expansion of the US economy all through the period also supported it. In short, the growth was supported both by the price effects and the income effects. This section attempts to estimate the degree of the income effects. The size of the income multiplier is of great interest especially during this time of dampened Asian economies caused by the currency crisis. These days, some economists argue that Japan should take a more expansionary policy and support the Asian economies. Whether such policy would be really effective or not depends on the interregional income multiplier. The multiplier estimated in this section is

still a preliminary one because estimates of the component parameters are not perfect, but it at least captures international repercussion effects.

3-1. Data and the Model

The estimation needs bilateral import data from the economies in the region in addition to the data used in the previous section. The import data were obtained from the United Nations, Trade Analysis and Reporting System (TARS), and the mising data related to Taiwan was supplemented by the respective original country statistics. Singapore's unpublished import data from Indonesia was replaced by the Indonesian export data to Singapore. All the bilateral import data were first converted to each economy's currency at the exchange rate for respective years. As a second step, they were deflated uniformly by the import deflator of each economy, since the import deflator by partner country is not available. The third step made the mechanical conversion of the base year to 1995. Finally, the data ware translated into the 1995 billion US dollars using the year average exchange rates of 1995.

The model for calculation of the interregional income multiplier is rather straight forward. It again starts with the simple Keynesian system.

$$Y_i = a_i + 1 / (1- c_i + m_i) * (E_i + I_i), \qquad i = 1 \sim n.$$

Note that a suffix denotes an economy i. Then the Ei can be divided into exports to the n economies in the region and to the rest of the world (ROW) as follows.

$$E_i = E_{i1} + E_{i2} + E_{i3} + \cdots + E_{in} + Ei_{ROW} , \qquad i = 1 \sim n.$$

E_{ij} denotes the export from an economy i to an economy j. The E_{ij} equals imports of economy j from economy i (M_{ij}) if we ignore the insurance, freight, and the timing of shipment. Moreover, M_{ij} can be shown by the following import function that is composed of marginal propensity to import and the GDP of the importing economy:

$$E_{ij} = M_{ij} = a_{ij} + m_{ij} Y_j, \qquad i , j = 1 \sim n. \quad i \neq j .$$

If we write the equation for n economies, it becomes an equation system as follows:

$$\left\{\begin{array}{l} Y_1 = a_1 + \dfrac{1}{1-C_1+m_1}(m_{12}Y_2 + m_{13}Y_3 + \cdots\cdots + m_{1n}Y_n + \sum a_{1j} + E_{1row} + I_1 \\ Y_2 = a_2 + \dfrac{1}{1-C_2+m_2}(m_{21}Y_1 + m_{23}Y_3 + \cdots\cdots + m_{2n}Y_n + \sum a_{2j} + E_{2row} + I_2 \\ \quad\cdot \qquad\qquad\qquad\qquad\qquad\qquad \cdot \\ \quad\cdot \qquad\qquad\qquad\qquad\qquad\qquad \cdot \\ \quad\cdot \qquad\qquad\qquad\qquad\qquad\qquad \cdot \\ Y_n = a_n + \dfrac{1}{1-C_n+m_n}(m_{n1}Y_1 + m_{n2}Y_2 + \cdots\cdots + m_{nn-1}Y_{n-1} + \sum a_{nj} + E_{nrow} + I_n \end{array}\right\}$$

By rearranging this into the matrix form and denoting the sum of constant terms by A_i ,

$$\begin{bmatrix} 1 & -\dfrac{m_{12}}{1-c_1-m_1} & \cdots & -\dfrac{m_{1n}}{1-c_1-m_1} \\ \dfrac{m_{21}}{1-c_2-m_2} & \mathbf{1} & \cdots & \dfrac{m_{2n}}{1-c_2-m_2} \\ & \cdots\cdots & & \\ & \cdots\cdots & & \\ \dfrac{m_{21}}{1-c_2-m_2} & \cdots\cdots & & \mathbf{1} \end{bmatrix} \begin{bmatrix} Y_1 \\ Y_2 \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ Y_n \end{bmatrix} = \begin{bmatrix} A_1 \\ A_2 \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ A_n \end{bmatrix} + \begin{bmatrix} \dfrac{E_{1row}+I_1}{1-c_1+m_1} \\ \dfrac{E_{1row}+I_1}{1-c_1+m_1} \\ \cdot \\ \cdot \\ \dfrac{E_{1row}+I_1}{1-c_1+m_1} \end{bmatrix}$$

Denoting the first square matrix by Z, the column vector of Y_i by Y, all the constant terms by A, the column vector of $(Ei_{ROW} + I_i) / (1 - c_i + m_i)$ by I, we finally obtain;

$$ZY = A + I.$$

Then the solution of Y associated with a certain amount of investment (I) is given by the following equation.

$$Y = Z^{-1}(A + I),$$

where, Z^{-1} is the inverse matrix of Z. It shows the total and income multipliers for each economy.

3-2. Interregional Multiplier

In order to obtain Z^{-1}, bilateral import functions were estimated for each of the eleven economies and the results are given in **Appendix 3**. Since each economy has 10 trade partners, the total number of equations amounts to 110. In the standard specification, GDP and relative price were used as explanatory variables. Since the relative price data are not available, cross exchange rates were used as proxy variables. Dummy variables and time trends were also added as explanatory variables when necessary. The AR(1) procedure was applied to eliminate serial correlation. However, equations still remain with unsatisfactory results.

From the bilateral import functions in Appendix 3, several interesting observations can be listed.

1) Japan's economic expansion generates slightly more imports from the USA compared to the opposite case. Japan's marginal propensity to import (MPM) from the USA is the largest among its trade partners at 0.024, while MPM of the USA from Japan is 0.021. In the two country's trade, the price factor does not play an important role. This explains why the USA very much wants Japan to introduce additional expansionary measures.

2) Japan's MPMs toward East Asian developing economies are generally smaller than those of the USA. Instead, the relative price impacts the imports from Taiwan, Thailand, and Malaysia, while it does not apply to the US imports from East Asia. Therefore, we may tentatively conclude that Japan's imports are less sensitive to its economic growth but more sensitive to the exchange rate movements when compared with the case of the USA.

3) The USA's and Japan's MPMs from China are far larger than those from other East Asian countries. This means Chinese exports are more dependent on the economic growth of Japan and the USA.

4) In all, the East Asian countries' MPMs from Japan are much larger than those from the

USA. On average, the figures for Japan are almost double those of the USA. This implies Japan gets more benefit than the USA when East Asian economies grow.

5) Korean imports are more sensitive to the relative price than other countries. The variable was significant for Japan, the USA, China, and Taiwan.

6) Finally, the explanatory power of Japan's equations was relatively small since it includes the turbulent period of boom and recession.

Table 7. Interregional Income Multiplier Effect

	Source country of impacts										
	Japan	USA	China	Korea	H.K.	Taiwan	Spore.	Indon.	Thailand	Malaysia	Philip.
Japan	1.5112	0.1299	0.1948	0.5463	0.4345	0.3973	0.4390	0.1620	0.3161	0.4351	0.3803
USA	0.0992	2.2300	0.1529	0.5900	0.3680	0.3150	0.3990	0.1733	0.1866	0.3978	0.3854
China	0.0398	0.1172	1.4011	0.1329	0.6022	0.1336	0.0952	0.0378	0.0471	0.0777	0.0952
Korea	0.0202	0.0620	0.0676	1.3252	0.1440	0.0715	0.0989	0.0621	0.0443	0.1116	0.0971
HongKong	0.0007	0.0007	0.0007	0.0015	0.3475	0.0056	0.0134	0.0012	0.0029	0.0072	0.0135
Taiwan	0.0119	0.0212	0.0877	0.0338	0.1663	1.3617	0.0601	0.0299	0.0488	0.0735	0.0709
Singapore	0.0036	0.0128	0.0084	0.0108	0.0515	0.0264	0.4845	0.0105	0.0165	0.0511	0.0198
Indonesia	0.0081	0.0219	0.0160	0.0349	0.0392	0.0384	0.0531	1.6054	0.0151	0.0332	0.0547
Thailand	0.0096	0.0188	0.0124	0.0126	0.0287	0.0287	0.0130	0.0109	0.9570	0.0242	0.0226
Malaysia	0.0033	0.0088	0.0071	0.0084	0.0313	0.0264	0.0865	0.0084	0.0137	0.5535	0.0093
Philippines	0.0019	0.0076	0.0021	0.0088	0.0070	0.0079	0.0171	0.0015	0.0040	0.0071	0.7280
Total	1.7094	2.6309	1.9508	2.7053	2.2204	2.4125	1.7597	2.1028	1.6523	1.7718	1.8768

Note: The countries on the lefteside column are the recipients of impacts.
The figure shows the income increase of each country generated by a 1 dollar increase in investment at 1995 constant prices.

Table 7 gives the inverse matrix of Z, and it is the interregional income multiplier at the 1995 price. The figures show the impacts of domestic expenditures from the economies in the top row to the economies in the left column. For example, the intersection of Japan's column and Japan's row indicates that a 1.51 dollar increase of income in Japan will be generated in total by the initial 1 dollar increase of independent investment in Japan. The second row of Japan's column shows the income increase in the USA generated by 1 dollar of investment increase in Japan. Therefore, the total in Japan's column shows the total impacts generated in the region by 1 dollar of investment increase in Japan. Here, it should be interpreted, by definition, that the export increase to the rest of the world plays the same role with investments.

In contrast to the multipliers given in **Table 5**, the additional income effect of interregional income repercussion with trade partners can be separated. For example, in Japan's case, the multiplier without repercussion is 1.486 compared to 1.511 with repercussion. The difference, 0.025, was generated from the interdependence of the economy. The figure for most economies is at or below the level of Japan, and it is even less for some of the developing economies. We can observe several features from **Table 7**. Each column shows how much impact the economy in the column will have on other economies in each row. It tells that, firstly, the USA has a larger total interregional income multiplier than Japan, 2.63 compared to Japan's 1.71. This implies that expansionary fiscal policy in Japan does not have as much impact on the region as the USA does. Impacts from Japan mainly goes to the USA, and some to China and Korea. Impacts to other East Asian economies are small. In contrast, the US impacts on the other East Asian economies are relatively large. This confirms that the ASEAN countries are more dependent on the US market than on the Japanese market.

Secondly, the developing East Asian economies' growth has much larger impacts on Japanese and US economies than vise versa. For example, one-dollar investment in Malaysia increases the GDP of Japan by 44 cents and that of the USA by 40 cents. In the case of Thailand, which also has close economic relations with Japan, the figures are 32 cents and 19 cents respectively. In this way, economic interdependence has increased the spread of income to suppliers of capital goods and intermediate goods. However, it does not mean the total impacts from Japan and the USA are small. Even though the coefficients are small, the absolute size of investments is much larger in Japan and the USA.

Thirdly, the NIEs, except Singapore, have relatively large total impacts on the region in comparison with ASEAN countries and China. The greatest impacts go to Japan and the USA. Korean growth has its strongest impacts on China and Indonesia among developing economies. Singapore has relatively strong impacts to neighboring Malaysia and Indonesia. Hong Kong's impacts on China are also large.

Fourthly, among the ASEAN countries, Thailand and Malaysia clearly have a larger impact on Japan is than on the USA. On average, the impacts to neighboring ASEAN

countries are not so small. An exception is the Philippines whose interdependence with any country is small.

If we read **Table 7** row-wise, it shows how much impact an economy will receive from other economies in the column. Since the initial impact is assumed to be one-dollar increase of investment for the whole economy, the figure does not show the size of impact, but it shows the strength of the linkage.

Firstly, Japan receives the strongest impact from Korea's investment, being followed by Singapore, Malaysia and Hong Kong. The USA also receives the strong impacts from Korea, but the impacts from other economies are generally lower than those of Japan.

Secondly, China gets the strongest impact from Hong Kong, followed by Korea, and the USA. However, Hong Kong does not get much impact from other economies' income generation. The impact is minimal because Hong Kong's exports have not increased because of other economies' income growth but instead mainly from a natural increase over time.

Thirdly, all the ASEAN economies receive impacts of less than 10 cents from other economies. This implies that the export competitiveness remains low in the NIEs or that the export commodity variety remains small.

Table 7 can also be used for simulation of an expansionary policy in one economy. For example, if Japan made additional investments of 10 trillion yen to stimulate the economy in recession, what would be the impacts on the regional economies? The amount corresponds to 106 billion US dollars at 1995 prices, and the impact on Japan itself would be 160 billion dollars after the domestic and interregional repercussion. The US GDP will increase by about 16 billion dollars, which is 10% of Japan's increase. Impacts on China, Korea, and Taiwan will be 6.2 billion dollars, 3.2 billion dollars, and 1.9 billion dollars respectively. Impacts on ASEAN economies are much smaller. The figures are, in descending order, 1.5 for Thailand, 1.3 for Indonesia, 0.6 for Singapore, 0.5 for Malaysia and 0.3 for the Philippines. The figures correspond to 0.22% of the US GDP in 1995. Likewise, 0.88% for China, 0.70% for Korea, 1.5% for Taiwan, 0.7% for Singapore, 0.90% for Thailand, 0.70% for Indonesia, 0.57% for Malaysia, and 0.41% for the Philippines. The

impacts on East Asian economies are relatively large compared to their GDP.

4. Concluding Remarks

The quantitative study has confirmed the deepening economic linkage among the countries in the region from the aspects of trade, FDI, and portfolio investment. It also made it clear that high import dependency of the ASEAN countries and China is making the Keynesian multiplier of each economy smaller. This will be a source of simultaneous economic boom, but at the same time it is a source of economic vulnerability of international policy coordination is not properly made. The interregional income multipliers have shown that Japan's fiscal expansion impacts are relatively smaller than those of the USA. This would imply that in the case of Japan the direct policies such as the FDI or other types of cross border investments should also be considered as a means to boost the East Asian economies. The US market still remains as an important absorber of the Asian products. All in all, the deepened economic interdependence through trade and investment liberalization in APEC's framework now requires a scheme for macro- economic policy coordination to appropriately manage risk.

Appendix 1. Estimation of Marginal Propensity to Consume

	constant term	GDP	AR(1)	Adjusted R-squared	Durbin-Watson Stat.
Japan	-64.0122	0.6201	0.3632	0.9825	1.1957
t-value		11.4418			
USA	-163.6841	0.6983		0.9890	1.3728
t-value		29.9531			
China	29.6371	0.5378		0.9981	1.5798
t-value		72.2703			
Korea	1.0685	0.6343	0.4983	0.9959	1.2571
t-value		25.7076			
Hong Kong	-15.5155	0.8238	0.4435	0.9863	1.2355
t-value		14.0122			
Taiwan	-20.7844	0.8311	0.4786	0.9938	0.8376
t-value		20.9109			
Singapore	7.6787	0.4049	0.6309	0.9929	2.1191
t-value		7.2791			
Indonesia	1.9549	0.6596		0.9952	2.2191
t-value		47.6432			
Thailand	8.2658	0.5899	0.4179	0.9989	2.1371
t-value		52.0802			
Malaysia	2.7156	0.5722		0.9883	1.1111
t-value		30.4385			
Philippines	-10.2647	0.9875		0.9716	0.6078
t-value		19.4201			

Notes: 1. All sample data are first converted to 1995 constant prices in local currencies, and then converted to billion US dollars using the 1995 exchange rate.
2. Serial correlation is corrected by the first order autoregressive process. The coefficient is shown in the column of AR(1).
3. The consumption data covers both private and government. However, private consumption data was used in the case of the USA.

Data Source: ADB, *Key Indicators;*
IMF, *International Financial Statistics Yearbook;*
US Census Bureau, *Statistical Abstract of United States;*
Management and Coordination Agency, Japan, *Japan Statistical Yearbook;*
Department of Statistics, Singapore, *Yearbook of Statistics Singapore*.

Appendix 2. Estimation of Marginal Propensity to Import

(Sample period: 1985-95)

	constant term	GDP	relative price	AR(1)	Dummy (years)	Adjusted R-squared	Durbin-Watson Stat.
Japan	-785.0956	0.2929			-99.6587	0.9668	1.8259
t-value		17.8620			(1991-93)		
USA	648.0228	0.1594	-922.9829		-61.2828	0.9764	2.3031
t-value		7.5606	-5.6371		(1991-93)		
China	58.7567	0.2639	-106.5580			0.9348	1.9934
t-value		11.6888	-1.8360				
Korea	-48.1600	0.4066			6.3720	0.9704	1.3557
t-value		10.1863			(1993-95)		
Hong Kong	-191.0341	2.7243			29.8375	0.9838	1.3897
t-value		22.3577			(1985)		
Taiwan	-11.4227	0.5768	-18.3497			0.9955	2.2449
t-value		24.7401	-2.2564				
Singapore	26.5347	1.5284	-31.0010			0.9887	1.7051
t-value		8.4930	-1.6480				
Indonesia	17.2255	0.2847	-25.0265			0.9914	2.2302
t-value		35.4822	-9.2841				
Thailand	-29.7158	0.6405				0.9957	1.6768
t-value		50.7447					
Malaysia	-43.4343	1.4193				0.9844	1.5350
t-value		29.3578					
Philippines	-68.7165	1.3669		0.6736		0.9781	1.1424
t-value		8.1503					

Notes: 1. All sample data are first converted to 1995 constant prices in local currencies, and then converted to billion US dollars using the 1995 exchange rate.
2. The relative price is given as the ratio of import deflator against GDP deflator. Import unit value index was used in the cases of China, Hong Kong, and Singapore.
3. Serial correlation is corrected by the first order autoregressive process. The coefficient is shown in the column of AR(1).
4. The consumption data covers both private and government. However, private consumption data was used in the case of the USA.

Data Source: ADB, *Key Indicators;*
IMF, *International Financial Statistics Yearbook;*
US Census Bureau, *Statistical Abstract of United States;*
Management and Coordination Agency, Japan, *Japan Statistical Yearbook;*
Department of Statistics, Singapore, *Yearbook of Statistics Singapore*.

Appendix 3. Estimation of Marginal propensity to import by trade partner

Notes: 1. All sample data are first converted to 1995 constant prices in local currencies, and then converted to billion US dollars using the 1995 exchange rate.
2. The relative price is approximated by the ratio of exchange rate of importer against the exchange rate of the trade partner.
3. Serial correlation is corrected by the first order autoregressive process. The coefficient is shown in the column of AR(1).
4. Imports were regressed to GDP, relative price, and time trend, including the option of AR(1) process, in each case. The most appropriate one was chosen.

Data Sources: ADB, *Key Indicators;*
IMF, *International Financial Statistics Yearbook;*
US Census Bureau, *Statistical Abstract of United States;*
Management and Coordination Agency, Japan, *Japan Statistical Yearbook;*
Department of Statistics, Singapore, *Yearbook of Statistics Singapore;*
United Nations, *Trade Analysis and Reporting Syaytem(TARS).*

<Japan> (Sample period: 1985-95)

	constant term	GDP	relative price	AR(1)	Dummy (years)	Time trend	Adjusted R-squared	Durbin-Watson Stat.
USA	-57.666	0.024466					0.893	1.012
t-value		9.184						
China	-151.780	0.014916					0.634	0.405
t-value		4.276						
Korea	-20.153	0.007240			-2.867		0.727	1.294
t-value		5.277			(1991-93)			
Hong Kong	-2.234	0.000979			-0.400		0.572	0.789
t-value		3.876			(1991-93)			
Taiwan	-1.185	0.003637	-1.215				0.782	1.213
t-value		4.172	-2.074					
Singapore	-10.002	0.003050			-1.513		0.825	1.786
t-value		6.997			(1991-93)			
Indonesia	1.992	0.002382					0.481	1.471
t-value		3.202						
Thailand	13.497	0.005685	-1.637	0.462			0.962	2.038
t-value		2.784	-3.688	2.614				
Malaysia	2.320	0.002434	-0.140	0.335			0.778	2.384
t-value		1.048	-1.842	1.476				
Philippines	-3.008	0.001196			-0.354		0.870	2.362
t-value		8.005			(1991-93)			

<USA> (Sample period: 1985-95)

	constant term	GDP	relative price	AR(1)	Dummy (years)	Time trend	Adjusted R-squared	Durbin-Watson Stat.
Japan	-29.123	0.020768		0.573			0.643	1.218
t-value		1.745		1.645				
China	-205.479	0.034461		0.551			0.919	1.324
t-value		4.812		2.435				
Korea	3725.418	0.017447				-1.919	0.507	1.381
t-value		2.381				-1.799		
Hong Kong	14.542	-0.000585					0.146	1.365
t-value		-1.644						
Taiwan	6.620	0.003064					0.236	1.149
t-value		2.023						
Singapore	-53.700	0.009830		0.484			0.940	1.507
t-value		5.899		1.649				
Indonesia	-27.057	0.004756		0.576			0.886	1.543
t-value		3.852		4.878				
Thailand	-44.145	0.007673		0.481			0.940	1.146
t-value		6.289		1.879				
Malaysia	-77.517	0.012885		0.582			0.908	1.436
t-value		4.333		2.917				
Philippines	-22.920	0.004102		0.517			0.917	1.469
t-value		4.915		2.545				

<China> (Sample period: 1985-95)

	constant term	GDP	relative price	AR(1)	Dummy (years)	Time trend	Adjusted R-squared	Durbin-Watson Stat.
Japan	-13.985	0.06297		0.502			0.796	1.979
t-value		3.516		1.855				
USA	-4.236	0.029526					0.890	2.689
t-value		9.04						
Korea	-11.672	0.030937					0.958	1.340
t-value		12.625						
Hong Kong	-1325.97					0.672	0.064	0.901
t-value						1.297		

Taiwan	-14.167	0.044068					0.902	1.567
t-value		9.637						
Singapore	-1.844	0.007425					0.944	1.619
t-value		12.973						
Indonesia	-0.860	0.004389					0.818	1.596
t-value		6.787						
Thailand	316.203	0.006187				-0.160	0.771	1.016
t-value		3.326				-2.082		
Malaysia	-1.122	0.004493					0.881	2.104
t-value		8.6771						
Philippines	-0.046	0.000478					0.664	1.607
t-value		4.219						

<Korea> (Sample period: 1985-95)

	constant term	GDP	relative price	AR(1)	Dummy (years)	Time trend	Adjusted R-squared	Durbin-Watson Stat.
Japan	-241.928	0.24722	-1.269	0.981			0.961	1.904
t-value		3.466	-1.956	22.447				
USA	-50.707	0.18397	-0.027	0.910			0.983	2.322
t-value		3.908	-3.906	15.099				
China	-15.404	0.04764	-0.007	0.850			0.990	2.974
t-value		4.145	-1.120	11.223				
Hong Kong	0.186	0.00158					0.565	1.803
t-value		3.738						
Taiwan	1.064	0.00964	-0.102	0.339			0.944	2.161
t-value		7.776	-2.969	1.031				
Singapore	-1.449	0.00791					0.911	1.847
t-value		10.143						
Indonesia	-1.930	0.0117					0.951	1.119
t-value		13.230						
Thailand	-0.338	0.00259					0.901	2.128
t-value		9.025						
Malaysia	0.253	0.00460					0.856	2.068
t-value		7.789						
Philippines	-3.350	0.00628		0.929			0.951	2.366
t-value		3.592		20.012				

<Hong Kong> (Sample period: 1985-95)

	constant term	GDP	relative price	AR(1)	Dummy (years)	Time trend	Adjusted R-squared	Durbin-Watson Stat.
Japan	-28.284	0.4161		0.448			0.973	1.848

t-value		8.992		2.336				
USA	-16.198	0.2256		0.426			0.989	1.518
t-value		11.117		2.294				
China	-88.560	1.1478		0.446			0.990	1.592
t-value		14.847		2.839				
Korea	-17.344	0.1963		0.678			0.971	2.009
t-value		3.869		3.595				
Taiwan	-17.958	0.2495		0.381			0.990	1.839
t-value		14.726		2.227				
Singapore	-19.238	0.2094		0.633			0.987	1.560
t-value		7.654		6.989				
Indonesia	-3.007	0.0331		0.671			0.968	2.428
t-value		3.966		3.762				
Thailand	-3.897	0.0472		0.538			0.977	2.006
t-value		6.459		2.679				
Malaysia	-8.613	0.0875		0.701			0.968	1.443
t-value		3.902		0.002				
Philippines	-0.501	0.0092					0.821	1.494
t-value		6.421						

<Taiwan> (Sample period: 1985-95)

	constant term	GDP	relative price	AR(1)	Dummy (years)	Time trend	Adjusted R-squared	Durbin-Watson Stat.
Japan	-8.379	0.1488					0.969	1.346
t-value		17.577						
USA	9.966	0.0736	-0.317				0.944	2.849
t-value		5.403	-2.503					
China	-10.047	0.0496		0.730			0.965	2.385
t-value		3.190		5.082				
Korea	-3.006	0.0249					0.961	1.395
t-value		16.695						
Hong Kong	-0.074	0.0091					0.264	0.933
t-value		2.142						
Singapore	-3.402	0.0313					0.957	1.655
t-value		14.872						
Indonesia	-1.467	0.0129		0.437			0.949	1.356
t-value		7.303		1.647				
Thailand	-3.236	0.0168		0.817			0.977	2.733
t-value		2.721		6.945				
Malaysia	-4.777	0.0264		0.801			0.967	1.983
t-value		2.685		6.078				
Philippines	-0.911	0.0053		0.846			0.929	2.094
t-value		1.504		4.479				

<Singapore> (Sample period: 1985-95)

	constant term	GDP	relative price	AR(1)	Dummy (years)	Time trend	Adjusted R-squared	Durbin-Watson Stat.
Japan	-7.235	0.4136					0.969	1.697
t-value		17.671						
USA	-1.532	0.2462		0.536			0.960	1.462
t-value		3.925		1.140				
China	-0.009	0.0456		0.398			0.901	1.809
t-value		4.548		2.364				
Korea	-2.952	0.0957		0.633			0.965	1.431
t-value		6.244		1.749				
Hong Kong	-1.730	0.0709					0.980	1.977
t-value		22.425						
Taiwan	0.703	0.0519		0.605			0.961	1.753
t-value		4.249		3.440				
Indonesia	0.145	0.0513					0.730	1.483
t-value		5.291						
Thailand	1208.139	0.2394				-0.613	0.957	1.183
t-value		4.310				-2.288		
Malaysia	-6.386	0.3152					0.965	2.173
t-value		16.551						
Philippines	-3.686	0.0404		0.941			0.909	1.634
t-value		1.888		6.949				

<Indonesia> (Sample period: 1985-95)

	constant term	GDP	relative price	AR(1)	Dummy (years)	Time trend	Adjusted R-squared	Durbin-Watson Stat.
Japan	-0.747	0.0454					0.796	1.604
t-value		6.320						
USA	0.112	0.0346	-0.001				0.815	1.852
t-value		3.730	-1.272					
China	0.261	0.0077	-0.002				0.115	1.507
t-value		4.762	-1.854					0.000
Korea	-2.352	0.0245		0.530			0.967	1.007
t-value		8.155		1.568				
Hong Kong	0.063	0.0011		0.334			0.627	1.855
t-value		2.040		1.197				
Taiwan	-0.351	0.0106		0.471			0.855	1.296
t-value		3.871		1.604				
Singapore	0.112	0.0101					0.731	1.599
t-value		5.304						
Thailand	-0.447	0.0049					0.769	1.609
t-value		5.852						
Malaysia	-0.460	0.0059					0.912	1.394
t-value		10.230						
Philippines		No significant estimation						

t-value							

<Thailand> (Sample period: 1985-95)

	constant term	GDP	relative price	AR(1)	Dummy (years)	Time trend	Adjusted R-squared	Durbin-Watson Stat.
Japan	-9.033	0.1805		0.442			0.981	1.306
t-value		11.640		1.170				
USA	6.489	0.0586	-0.335				0.977	1.455
t-value		11.782	-1.231					
China	-0.506	0.0144					0.878	1.382
t-value		8.552						
Korea	-1.195	0.0226		0.566			0.955	1.483
t-value		5.407		1.572				
Hong Kong	-0.197	0.0062					0.728	2.001
t-value		5.270						
Taiwan	-1.588	0.0305					0.980	1.368
t-value		22.284						
Singapore	-0.363	0.0278		0.685			0.939	1.269
t-value		3.163		2.412				
Indonesia	-0.276	0.0053					0.846	2.007
t-value		7.465						
Malaysia	1647.920	0.1072				-0.833	0.952	2.352
t-value		5.104				-3.898		
Philippines	-0.135	0.0031					0.432	0.703
t-value		2.934						

<Malaysia> (Sample period: 1985-95)

	constant term	GDP	relative price	AR(1)	Dummy (years)	Time trend	Adjusted R-squared	Durbin-Watson Stat.
Japan	-13.211	0.3782					0.981	1.362
t-value		22.469						
USA	-7.693	0.2285		0.620			0.980	1.297
t-value		7.031		1.492				
China	-0.843	0.0285					0.978	1.913
t-value		21.000						
Korea	593.500	0.1151				-0.301	0.941	1.309
t-value		4.622				-2.539		
Hong Kong	-0.918	0.0280					0.972	1.584
t-value		18.631						
Taiwan	-2.630	0.0751		0.484			0.983	1.233
t-value		13.063		1.464				

Singapore	-5.170	0.1743					0.973	1.294
t-value		19.071						
Indonesia	-0.748	0.0216					0.970	1.562
t-value		17.916						
Thailand	0.213	0.0306	-10.439				0.932	1.316
t-value		11.320	-1.125					
Philippines	-0.248	0.0077		0.456			0.813	1.908
t-value		2.647		1.416				

<Philippines> (Sample period: 1985-95)

	constant term	GDP	relative price	AR(1)	Dummy (years)	Time trend	Adjusted R-squared	Durbin-Watson Stat.
Japan	-12.703	0.2521		0.679			0.935	1.090
t-value		3.719		2.473				
USA	-8.004	0.1775		0.450			0.930	2.288
t-value		5.787		1.426				
China	-1.926	0.0339		0.589			0.178	1.707
t-value		1.453		2.249				
Korea	-3.119	0.0733	-26.048				0.921	1.492
t-value		6.848	-1.865					
Hong Kong	-2.352	0.0494					0.934	0.532
t-value		11.952						
Taiwan	-2.381	0.0533		0.404			0.988	2.472
t-value		10.321		1.414				
Singapore	-4.667	0.0840		0.581			0.861	1.360
t-value		3.627		2.336				
Indonesia	-2.203	0.0374		0.623			0.815	2.502
t-value		2.951		3.754				
Thailand	-0.817	0.0210	-0.385				0.767	1.363
t-value		3.829	-1.434					
Malaysia	0.014	0.0050					0.106	1.435
t-value		1.479						