FINAL DRAFT REPORT

"The Trends in Trade, Foreign Direct Investments and Monetary Flows in East Asia, and its Policy Implications"

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Chapter 1: Trends in Trade Flows in East Asia[1]

1 Introduction

Past decades have witnessed the acceleration in trade flows, foreign direct investments (FDIs), and monetary flows within and into East Asia. The rapid expansion of inter and intra-regional trade in goods and services as well as FDIs in the region is largely due to countries' implementation of unilateral and multilateral trade and investment liberalization measures and preferential trading arrangements, as well as proliferation of global and regional production networks. Monetary flows into the region have also risen over time primarily because of capital account liberalization and deregulation measures, as well as domestic financial market reforms.

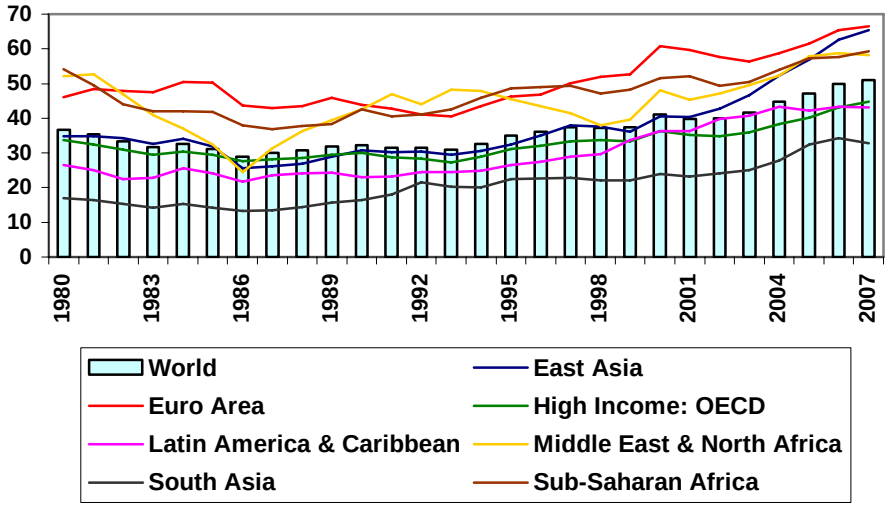
Recent trends in the pattern and magnitude of trade and investments in East Asia raised concerns on the macroeconomic challenges that countries in the region may face. For one, a surge in capital inflows could result in an appreciation of the real exchange rate, which could then undermine international competitiveness of exports and investment demand, and could thereby hamper economic growth. This could also lead to rapid credit and liquidity growth, and may potentially exacerbate inflationary pressures. In addition, various country experiences around the world have indicated the close association between monetary flow surges and episodes of financial crises. Indeed, the current global financial turmoil, with stock markets falling rapidly and certain large financial institutions experiencing closures and receiving large bailout packages, together with the economic slowdown and recessions of developed economies and emerging markets around the world, have shown that East Asia is not totally immune to such global economic shocks. In this regard, it is imperative to identify the potential macroeconomic and financial risks that East Asian countries face and the appropriate policy responses that are needed to mitigate such risks.

2 Background

The last three decades or so witnessed the expansion of merchandise trade in East Asia. From 34.9% in 1980, merchandise trade as a share to gross domestic product (GDP) of East Asia rose sharply to 65.4% in 2007, slightly lower than Euro Area's 66.5% but higher than the other regions, including the world average (Figure 1.1). Growth in merchandise trade of East Asia is one of the fastest in the world and this can be attributed to the region's foreign trade and investment liberalization measures, technological improvements, and increasing degree of economic integration, among other factors.

[1] East Asia comprises of Brunei Darussalam, Cambodia, Hong Kong (China), Indonesia, Japan, Lao PDR, Malaysia, Myanmar, People's Republic of China, Philippines, Republic of Korea, Singapore, Thailand, and Viet Nam.

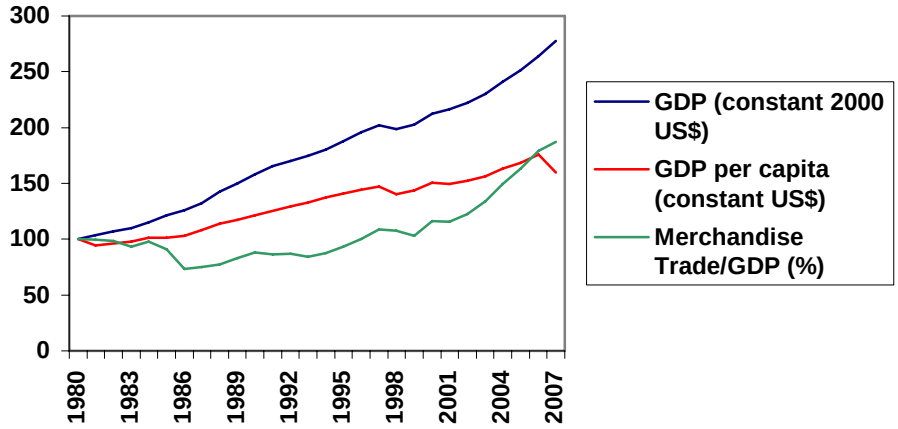
Figure 1.1: Merchandise Trade, by Region, 1980-2007
(% of GDP)



GDP = gross domestic product, OECD = Organisation for Economic Co-operation and Development.
Source of basic data: World Bank. *World Development Indicators Online* .

The rise in East Asia's trade openness is seen to be instrumental in boosting economic growth in the region. Empirical evidence has shown that trade openness has a large and significant effect on national income (Frankel and Romer, 1999). Indeed, a positive relation between merchandise trade to GDP ratio and real GDP and GDP per capita appears to the case for East Asia (Figure 1.2).

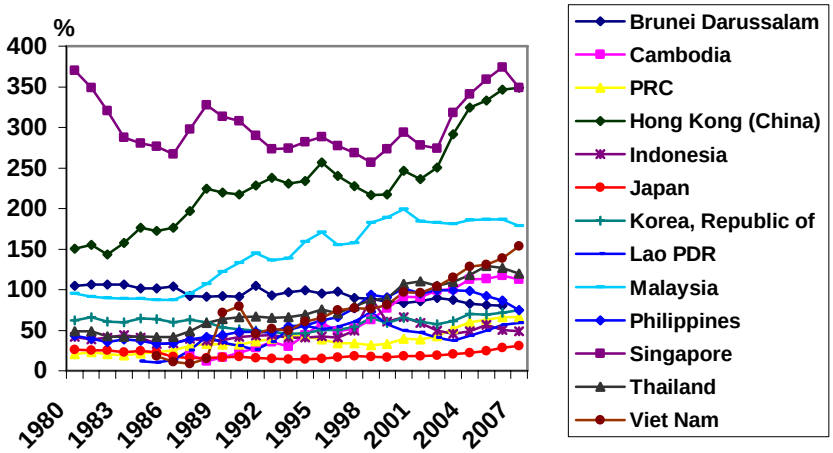
Figure 1.2: GDP, GDP per capita, and Merchandise Trade/GDP in East Asia, 1980-2007
(1980 = 100)



GDP = gross domestic product, US = United States.
Source of basic data: World Bank. *World Development Indicators Online* .

Since 1980, most East Asian economies registered positive growth in their merchandise trade (Figure 1.3). During the 2000s, Japan, People's Republic of China (PRC), and Viet Nam achieved relatively fast growth in their merchandise trade to GDP ratios. It has been pointed out that PRC is very well considered as a major trading player in the region given its exceptional trade growth (see also Brooks and Hua, 2008). As of 2007, Hong Kong (China) and Singapore posted the highest merchandise trade to GDP ratios in the region.

Figure 1.3: Merchandise Trade in East Asia, 1980-2007
(% of GDP)



GDP = Gross domestic product, PRC = People's Republic of China.
Source of basic data: World Bank. *World Development Indicators Online.*

The evolution of the pattern of trade in East Asia can be traced back to Japan, which first experienced success in its export markets during the 1950s and 1960s, and later shifted to more sophisticated products, allowing newly industrializing economies in the region to begin exporting labor-intensive goods. By the mid to late-1980s, these economies succumbed to rising labor costs and real currency appreciation, and coupled with tightening quantitative restrictions in developed economies on labor-intensive products, led them to incur deteriorating comparative advantage over these products. This pushed Japan and the newly industrialized economies to relocate their production facilities to Southeast Asian economies, which were relatively attractive to foreign investors because of their favorable macroeconomic, investment, and trade policies, as well as attractive business environment, mainly due to relatively low labor costs. Furthermore, starting in the late 1980s, Southeast Asian economies began exporting labor-intensive manufactures and electronic products. (ADB, 2007b).

Manufactures comprise a large portion of merchandise trade across East Asian economies (Table 1.1). As of 2006, 92.4% of PRC's merchandise exports to the world were manufactures. PRC, together with certain neighboring economies like Malaysia and the Philippines, experienced remarkable growth in their share of manufactures to merchandise exports since the 1980s.

Table 1.1: Manufactures Exports of East Asian Economies, 1980-2006
(% of Merchandise Exports)

	1980	1985	1990	1995	2000	2006
Brunei Darussalam	0.0	0.0	0.5	—	—	3.3
Cambodia	—	—	—	—	96.1	—
Hong Kong (China)	95.7	95.1	94.5	93.6	95.3	91.0
Indonesia	2.3	13.0	35.5	50.6	57.1	44.7
Japan	94.7	96.3	95.9	95.2	93.9	91.0
Korea, Republic of	89.5	91.3	93.5	93.3	90.7	89.5
Lao PDR	—	—	—	—	—	—
Malaysia	18.8	27.2	53.8	74.7	80.4	73.7
Myanmar	—	—	—	—	—	—
Philippines	21.1	26.8	37.9	41.5	91.7	86.7
PRC	—	26.4	71.6	84.1	88.2	92.4
Singapore	46.7	51.2	71.6	83.9	85.6	79.5
Thailand	25.2	38.1	63.1	73.1	75.4	76.0
Viet Nam	—	—	—	—	42.7	—

— = data not available, PRC = People's Republic of China.
Source: World Bank. *World Development Indicators Online* .

Manufactures also comprise a relatively large portion of merchandise imports of East Asian economies, ranging from 52.0% in Japan to 90.9% in Hong Kong, China (Table 1.2). Since 1980, manufactures share to merchandise imports has increased in all economies in the region except Indonesia. The fastest growth in the share of manufactures imports to merchandise imports is evident in Japan, as its share went up sharply from 18.7% in 1980 to 52.0% in 2006.

Table 1.2: Manufactures Imports of East Asian Economies, 1980-2006
(% of Merchandise Imports)

	1980	1985	1990	1995	2000	2006
Brunei Darussalam	78.8	72.8	77.9	—	—	79.3
Cambodia	—	—	—	—	72.7	—
Hong Kong (China)	75.1	78.4	85.5	88.5	90.5	90.9
Indonesia	64.9	72.1	76.9	72.9	61.2	52.7
Japan	18.7	25.4	44.3	54.2	56.7	52.0
Korea, Republic of	43.1	57.2	63.4	68.0	62.2	58.0
Lao PDR	—	—	—	—	—	—
Malaysia	66.6	71.6	82.2	85.7	84.8	77.8
Myanmar	—	—	—	—	—	—
Philippines	47.5	37.1	53.2	57.8	78.0	74.6
PRC	—	52.2	79.8	79.0	75.1	71.2
Singapore	54.1	55.4	73.1	83.2	81.8	73.8
Thailand	50.8	60.1	75.0	80.7	76.7	68.2
Viet Nam	—	—	—	—	72.7	—

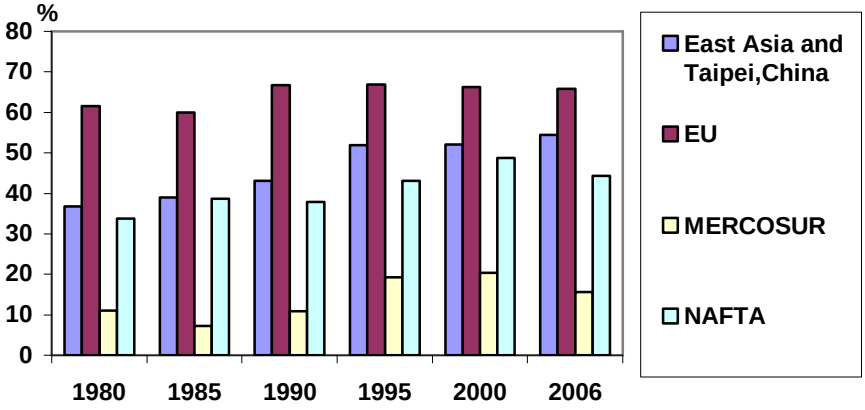
— = data not available, PRC = People's Republic of China.
Source: World Bank. *World Development Indicators Online* .

3 Intra-Regional Trade

Intra-regional trade in East Asia expanded significantly in the past years (Figure 1.4). From 36.8% in 1980, the share of intra-regional exports to total trade of East Asia (including Taipei,China) rose to 54.5% in 2006, higher than MERCOSUR and North American Free Trade Area (NAFTA) but still lower than the European Union (EU). Growth of East Asia's intra-regional trade since the 1980s has been much faster than the other regions.

Figure 1.4: Intra-Regional Trade Share, 1980-2006

(%)



EU = European Union, NAFTA = North American Free Trade Area.

Source of basic data: Kawai and Wignaraja (2007).

The growth in East Asia's intra-regional exports has been much faster in more recent years. For example, intra-regional exports valued $567.8 billion in 1997, slightly rose to $673.6 billion by 2002, and sharply climbed to $1,547.9 billion by 2007 (Table 1.3). All East Asian economies registered an increase in their intra-regional exports. In terms of intra-regional export share, PRC had the biggest gain from 17.2% in 1997 to 28.2% in 2007; this confirms PRC's dominance in intra-regional trade. Conversely, Japan's suffered a large decline in terms of intra-regional exports; Hong Kong, China had a slight reduction; while this was about steady for Republic of Korea. It has been conjectured that the deterioration of Japan's importance in intra-regional trade is largely caused by Japan's prolonged recession (Urata 2006). Turning to ASEAN-5—Indonesia, Malaysia, Philippines, Singapore, and Thailand, its intra-regional export share had a mild downturn, from 30.0% in 1997 to 28.7% in 2002 and 28.6% in 2007.

Table 1.3: Intra-Regional Exports by East Asian Economy, 1997, 2002, and 2007

	1997		2002		2007	
	Value ($ billion)	Share (%)	Value ($ billion)	Share (%)	Value ($ billion)	Share (%)
Brunei Darussalam	2.4	0.4	2.9	0.4	—	—
Cambodia	—	—	0.6	0.1	—	—
Hong Kong, China	92.3	16.2	106.8	15.9	212.6	13.7
Indonesia	29.1	5.1	30.2	4.5	64.9	4.2
Japan	145	25.5	149.5	22.2	289.7	18.7
Lao PDR	—	—	—	—	—	—
Malaysia	40.6	7.2	48.5	7.2	91.7	5.92
Myanmar	—	—	—	—	—	—
Philippines	9.5	1.7	15.9	2.4	28.7	1.9
PRC	97.5	17.2	146.0	21.7	436.7	28.2
Republic of Korea	60.4	10.6	67.4	10.0	165.8	10.7
Singapore	63.4	11.2	66.5	9.9	180.2	11.6
Thailand	27.6	4.9	32.1	4.8	77.6	5.0
Viet Nam	—	—	7.2	1.1	—	—
Total	567.8	100.0	673.6	100.0	1547.9	100.0

— = data not available, PRC = People's Republic of China.

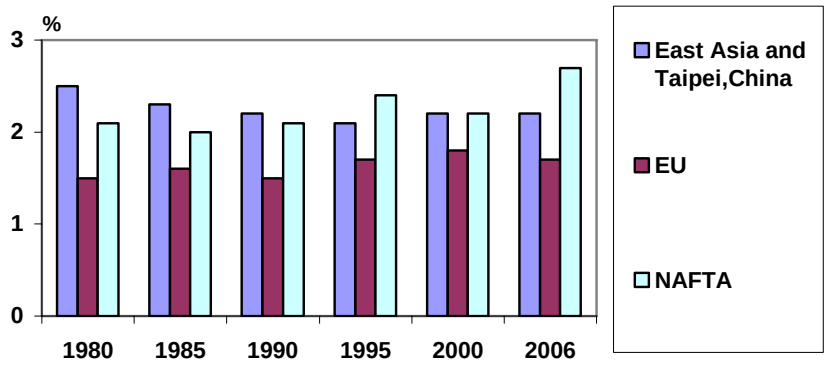
Source of basic data: United Nations Comtrade Database.

The high level of intra-regional trade in East Asia indicates that such pattern of trade in the region is "intense", i.e., greater than expected, as shown by its relatively high intra-regional trade intensity index for the last two decades or so (Figure 1.5). Each of the East Asian economies has most of their bilateral trade flows with another economy in the region to be "intense" (Table 1.4). For example, in 2004, both Singapore and Thailand appear to have all of their corresponding bilateral trade with other neighboring economies in the region to be “intense”, and this was followed by PRC which had its trade with each of the East Asian economies, except for Brunei Darussalam, to be “intense” as well.[2] There is evidence that bilateral trade intensity index between most East Asian economies has been growing in the last two decades or so (see Ng and Yeats, 2003).

[2] The finding that there is trade intensity between PRC and East Asian economies is consistent with Ng and Yeats (2003).

Figure 1.5: Intra-Regional Trade Intensity Index, by Region, 1980-2006

(%)



EU = European Union, NAFTA = North American Free Trade Area.

Note: Intra-regional trade intensity index is the ratio of intra-regional trade share to the share of world trade with the region.

Source of basic data: Rana (2007).

Table 1.4: Bilateral Trade Intensity Index in East Asia, 2004

	Trading Partner													
Reporter	**BRU**	**CAM**	**HKG**	**INO**	**JPN**	**KOR**	**LAO**	**MAL**	**MYA**	**PHI**	**PRC**	**SIN**	**THA**	**VIE**
BRU	n.a.	n.a.	0.6	6.8	5.4	4.2	n.a.	4.2	0.1	0.1	0.6	7.3	6.4	0.1
CAM	n.a.	n.a.	5.2	2.6	0.5	1.1	n.a.	1.5	n.a.	0.3	1.2	2.4	5.5	15.9
HKG	0.3	2.8	n.a.	0.7	1.6	1.4	0.2	1.2	0.5	2.2	6.3	2.5	1.3	1.0
INO	8.0	2.0	0.7	n.a.	3.4	2.2	0.2	2.9	1.9	2.1	1.1	6.8	3.8	2.8
JPN	5.6	0.6	1.9	3.7	n.a.	2.5	0.3	1.9	0.8	3.0	2.4	1.6	3.2	2.2
KOR	4.4	0.9	2.4	2.9	2.6	n.a.	0.3	1.5	1.2	2.0	2.4	1.4	1.1	2.6
LAO	n.a.	n.a.	0.3	0.2	0.3	0.3	n.a.	0.1	n.a.	0.0	1.1	1.8	44.2	29.5
MAL	4.1	1.3	2.4	4.3	2.3	1.6	0.2	n.a.	3.3	1.2	3.5	8.8	4.9	2.4
MYA	0.1	n.a.	0.7	1.7	0.8	1.2	n.a.	2.8	n.a.	0.3	2.6	7.8	27.2	1.9
PHI	0.2	0.3	3.1	2.2	3.4	1.8	0.0	3.5	0.3	n.a.	0.9	4.8	3.0	4.3
PRC	0.7	1.3	5.2	1.6	2.6	3.0	1.4	1.6	2.9	2.0	n.a.	1.5	1.4	1.9
SIN	5.4	3.7	3.3	11.5	1.6	1.6	1.6	10.9	6.2	1.3	4.1	n.a.	4.0	4.2
THA	6.7	12.6	1.7	4.0	3.4	1.1	50.1	4.1	30.2	3.0	1.2	3.9	n.a.	3.9
VIE	0.0	10.9	1.6	2.4	2.2	2.8	34.5	2.2	2.0	1.7	3.4	5.3	4.0	n.a.

n.a. = not applicable, BRU = Brunei Darussalam, CAM = Cambodia, HKG = Hong Kong, China, INO = Indonesia, JPN = Japan, KOR = Republic of Korea, LAO = Lao PDR, MAL = Malaysia, MYA = Myanmar, PHI = Philippines, PRC = People's Republic of China, SIN = Singapore, THAI = Thailand, and VIE = Viet Nam.

Note: Trade intensity index is the ratio of the total trade share of an economy to the share of world trade with a trading partner. An index that is higher (lower) than one indicates that trade between the economy and its trading partner is larger (smaller) than expected given the importance of world trade.

Source: ADB. Asia Regional Integration Center (www.aric.adb.org)

The past ten years or so manifests a change in the direction of trade within East Asia. In 1997, Japan was the largest East Asian exporter to the region while PRC was the largest export destination (Table 1.5a). Also, Japan served as the largest export market for five economies in the region—Brunei Darussalam, Indonesia, Republic of Korea, the Philippines, and Thailand. By 2007, PRC replaced Japan as the largest East Asian source of intra-regional exports while retaining its status as largest export destination (Table 1.5b). Notably, PRC became the largest export market of Japan and Republic of Korea, in addition to Hong Kong, China. It may be worthwhile to note that intra-industry trade between Japan and PRC increased substantially since the 1980s and a large proportion of this trade pattern is in electrical and machinery

products (Xing 2007). On the other hand, Japan was and still is the largest export market for three major ASEAN economies, namely, Indonesia, Philippines, and Thailand.

Table 1.5a: Direction of Intra-Regional Exports in East Asia, 1997
(US$ billion)

	Destination														
Source	**BRU**	**CAM**	**HKG**	**INO**	**JPN**	**KOR**	**LAO**	**MAL**	**MYA**	**PHI**	**PRC**	**SIN**	**THA**	**VIE**	**Total**
BRU	n.a.	0.0	0.0	0.0	**1.4**	0.5	0.0	0.1	0.0	0.0	0.0	0.2	0.3	0.0	2.4
CAM	—	n.a.	—	—	—	—	—	—	—	—	—	—	—	—	—
HKG	0.0	0.1	n.a.	0.9	11.4	2.8	0.0	1.7	0.1	2.2	**65.6**	4.9	1.9	0.6	92.3
INO	0.0	0.1	1.8	n.a.	**12.5**	3.5	0.0	1.4	0.1	0.8	2.2	5.5	0.8	0.4	29.1
JPN	0.1	0.1	**27.3**	10.2	n.a.	26.1	0.0	14.5	0.2	8.7	21.7	20.2	14.6	1.3	**145.0**
KOR	0.0	0.1	11.7	3.5	**14.8**	n.a.	0.0	4.4	0.1	2.6	13.6	5.8	2.2	1.6	60.4
LAO	—	—	—	—	—	—	n.a.	—	—	—	—	—	—	—	—
MAL	0.3	0.1	4.3	1.2	9.8	2.5	0.0	n.a.	0.4	1.2	1.9	**15.8**	2.8	0.3	40.6
MYA	—	—	—	—	—	—	—	—	n.a.	—	—	—	—	—	—
PHI	0.0	0.0	1.2	0.2	**4.2**	0.5	0.0	0.6	0.0	n.a.	0.2	1.6	0.9	0.1	9.5
PRC	0.0	0.1	**43.8**	1.8	31.8	9.1	0.0	1.9	0.6	1.3	n.a.	4.3	1.5	1.1	97.5
SIN	1.4	0.4	12.0	—	8.8	3.7	0.0	**21.8**	0.7	3.0	4.1	n.a.	5.7	1.7	63.4
THA	0.1	0.3	3.5	1.2	**8.7**	1.0	0.4	2.5	0.4	0.7	1.8	6.4	n.a.	0.5	27.6
VIE	—	—	—	—	—	—	—	—	—	—	—	—	—	n.a.	—
Total	2.0	1.2	105.6	19.2	103.5	49.6	0.5	48.9	2.6	20.4	**111.1**	64.8	30.8	7.6	**567.8**

— = data not available, n.a. = not applicable, BRU = Brunei Darussalam, CAM = Cambodia, HKG = Hong Kong, China,
INO = Indonesia, JPN = Japan, KOR = Republic of Korea, LAO = Lao PDR, MAL = Malaysia, MYA = Myanmar, PHI = Philippines,
PRC = People's Republic of China, SIN = Singapore, THAI = Thailand, and VIE = Viet Nam.
Source of basic data: United Nations Comtrade Database.

Table 1.5b: Direction of Intra-Regional Exports in East Asia, 2007
(US$ billion)

	Destination														
Source	**BRU**	**CAM**	**HKG**	**INO**	**JPN**	**KOR**	**LAO**	**MAL**	**MYA**	**PHI**	**PRC**	**SIN**	**THA**	**VIE**	**Total**
BRU	n.a.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CAM	—	n.a.	—	—	—	—	—	—	—	—	—	—	—	—	—
HKG	0.0	0.6	n.a.	1.8	15.3	7.3	0.0	3.2	0.0	2.9	**168.6**	6.5	3.8	2.4	212.6
INO	0.0	0.1	1.7	n.a.	**23.6**	7.6	0.0	5.1	0.3	1.9	9.7	10.5	3.1	1.4	64.9
JPN	0.1	0.1	38.9	9.1	n.a.	54.3	0.0	15.1	0.2	9.5	**109.3**	21.8	25.6	5.7	289.7
KOR	0.0	0.3	18.7	5.8	26.4	n.a.	0.1	5.7	0.3	4.4	**82.0**	11.9	4.5	5.8	165.8
LAO	—	—	—	—	—	—	n.a.	—	—	—	—	—	—	—	—
MAL	0.4	0.1	8.1	5.2	16.1	6.7	0.0	n.a.	0.2	2.5	15.4	**25.8**	8.7	2.3	91.7
MYA	—	—	—	—	—	—	—	—	n.a.	—	—	—	—	—	—
PHI	0.0	0.0	5.8	0.5	**7.3**	1.8	0.0	2.5	0.0	n.a.	5.7	3.1	1.4	0.4	28.7
PRC	0.1	0.9	**184.4**	12.6	102.0	56.1	0.2	17.7	1.7	7.5	n.a.	29.6	12.0	11.9	**436.7**
SIN	0.7	0.4	31.3	29.4	14.4	10.6	0.0	**38.6**	0.8	6.1	28.9	n.a.	12.4	6.5	180.2
THA	0.1	1.4	8.7	4.9	**18.1**	3.0	1.3	7.8	1.0	2.9	14.9	9.6	n.a.	4.0	77.6
VIE	—	—	—	—	—	—	—	—	—	—	—	—	—	n.a.	0.0
Total	1.5	3.9	297.7	69.2	223.3	147.4	1.7	95.7	4.4	37.7	**434.5**	118.9	71.4	40.4	**1,547.7**

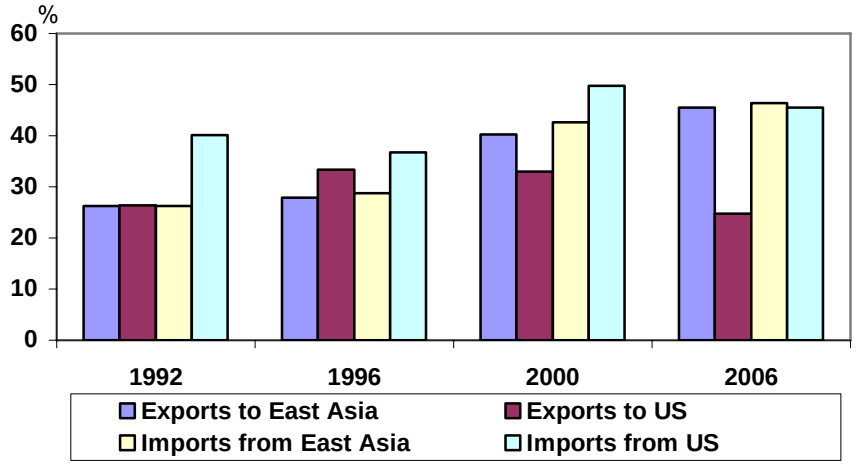
— = data not available, n.a. = not applicable, BRU = Brunei Darussalam, CAM = Cambodia, HKG = Hong Kong, China,
INO = Indonesia, JPN = Japan, KOR = Republic of Korea, LAO = Lao PDR, MAL = Malaysia, MYA = Myanmar, PHI = Philippines,
PRC = People's Republic of China, SIN = Singapore, THAI = Thailand, and VIE = Viet Nam.
Source of basic data: United Nations Comtrade Database.

The pattern and relatively high level of intra-regional trade in East Asia clearly indicates the increasing importance of international production sharing or international product fragmentation in the region. This globalization phenomenon depicts the dispersion of production or assembly operations in many sectors across borders (Athukorala, 2006). For example, multinational corporations (MNCs) that are owned and controlled mostly by, say Japan and Republic of

Korea, together with their affiliates located in other East Asian economies, mainly produce sophisticated capital or technologically-intensive products, shipping them to PRC and ASEAN for labor-intensive assembly work, and then exporting the final product to East Asia as well as to the rest of the world, including the EU and US (Thorbecke and Yoshitomi 2006). Indeed, the significance of production sharing in East Asia manifests from the large and growing share of parts and components in intra-regional trade (Ng and Yeats, 2003; Brooks and Hua 2008; Shin 2008). According to Shin (2008), East Asia's export share of parts and components in intra-regional manufacturing trade flows increased sharply from 26.2% in 1992 to 45.5% in 2006, and import share of parts and components also went up for the region, from 26.2% in 1992 to 46.4% in 2006 (Figure 1.6). It has likewise been conjectured that the trade share of parts and components of East Asia with the US declined over the years (Ibid.). The relatively large share in parts and components in intra-regional trade is linked to MNCs implementation of their fragmentation strategy via the establishment of production networks in the region (Urata, 2006).

Figure 1.6: Share of Parts and Components in East Asia's Manufacturing Trade Flows, 1992, 1996, 2000, and 2006

(%)



US = United States.

Source of basic data: Shin (2008)

Electronics circuits serve as the largest type of parts and components that are in East Asia's intra-regional trade (Table 1.6). In terms of intra-regional exports, electronics circuits is the largest for Hong Kong (China), Japan, Malaysia, PRC, and Singapore while in terms of intra-regional imports, its the largest for Hong Kong (China), PRC, Republic of Korea, and Singapore. PRC is the largest exporter and importer of electronics circuits within the region.

Table 1.6: Top Intra-Regional Exports and Imports of East Asian Economies, by 6-digit Commodity Classification, 2007

	Trade Flow	HS Code	HS 4-digit Commodity Classification	Value (US$ billion)	Share in Economy's Total Intra-Regional Exports / Imports (%)
Hong Kong, China	Export	HS-854239	Other electronic integrated circuits, other than Amplifiers/Memories/Processors & controllers.	14.2	6.7
	Import	HS-854239	Other electronic integrated circuits, other than Amplifiers/Memories/Processors & controllers.	15.0	5.5
Indonesia	Export	HS-271111	Natural gas, liquefied.	9.8	15.1
	Import	HS-271000	Petroleum oils & oils obta.	10.6	24.8
Japan	Export	HS-854221	Monolithic integrated circuits, digital.	14.8	5.8
	Import	HS-271111	Natural gas, liquefied.	11.9	5.2
Malaysia	Export	HS-854221	Monolithic integrated circuits, digital.	6.9	7.5
	Import	HS-847330	Parts & accessories (excl. covers, carrying cases and the like) suit.	6.1	7.2
Philippines	Export	HS-999999	Commodities not elsewhere specified.	12.7	44.2
	Import	HS-999999	Commodities not elsewhere specified.	6.8	22.3
PRC	Export	HS-854221	Monolithic integrated circuits, digital.	19.0	4.3
	Import	HS-854221	Monolithic integrated circuits, digital.	73.2	20.4
Republic of Korea	Export	HS-271019	Petroleum oils & oils obtained from bituminous minerals (other than crude) & preparations not elsewhere specified.	11.6	7.0
	Import	HS-854231	Electronic integrated circuits, processors & controllers, whether/not combined with memories, converters, logic circuits, amplifiers, clock & timing circuits,/other circuits.	8.3	5.4
Singapore	Export	HS-854239	Other electronic integrated circuits, other than Amplifiers/Memories/Processors & controllers.	40.1	22.3
	Import	HS-854239	Other electronic integrated circuits, other than Amplifiers/Memories/Processors & controllers.	25.1	18.4
Thailand	Export	HS-847170	Storage units.	5.1	6.6
	Import	HS-847330	Parts & accessories (excl. covers, carrying cases and the like) suit.	3.6	4.5

EU = European Union, HS = Harmonized System, PRC = People's Republic of China.

Note: No data for Brunei Darussalam, Cambodia, Lao PDR, and Viet Nam. Japan is as of 2006.

Source of basic data: United Nations Comtrade Database.

It may be important to note that there has been an improvement in intra-regional trade in ASEAN region with respect to certain products of sectors that are identified by ASEAN leaders to be in need of acceleration in economic integration, a.k.a., "priority goods sectors".

Specifically, it has been found that within the ASEAN region, products that have attained an improvement in intra-industry trade and economic integration in recent years were in the automotive, electronics, healthcare, and information and telecommunications technology sectors, whereas agro-based, fisheries, garments and textiles, rubber-based, and wood-based products appeared to have not experienced a rise in economic integration (Austria 2004).

4 East Asia's Trade with EU and US

East Asia is the largest export market for East Asian economies compared to EU and US (Table 1.7). Between 2000 and 2007, most East Asian economies experienced an increase in their respective intra-regional export shares, while their export shares vis-à-vis EU and US have gone down. On the other hand, PRC's intra-regional export share sharply drop while its export share in the US rose dramatically, implying that US has become an increasingly attractive destination for PRC's exports since 2000.

Table 1.7: Export Share of East Asian Economy in East Asia, EU, and US, 2000 and 2007

(%)

	Destination					
	East Asia		EU		US	
	2000	2007	2000	2007	2000	2007
Hong Kong, China	47.9	60.8	5.4	4.3	23.2	2.1
Indonesia	54.6	56.9	17.1	15.3	13.7	13.3
Japan	32.7	40.6	17.7	14.9	30.0	20.9
Malaysia	50.5	52.0	17.2	13.9	20.5	19.1
Philippines	40.3	56.8	22.2	15.2	30.0	19.4
PRC	46.1	35.9	27.6	26.0	20.9	27.9
Republic of Korea	40.5	44.6	14.4	14.5	21.9	13.3
Singapore	50.3	60.2	11.6	8.4	17.3	6.2
Thailand	45.1	50.5	18.1	14.8	21.4	15.5

PRC = People's Republic of China.

Note: Export share is the percentage share of East Asian economy's total exports flowing to destination economy to the economy's total exports flowing to the world.

Source of basic data: United Nations Comtrade Database.

Unsurprisingly, all East Asian economies have relatively high import shares in East Asia, ranging from 39.2% for Japan to 74.0% for Hong Kong (China) in 2007; that with the exception of Singapore, the rest experienced a rise in their intra-regional import shares between 2000 and 2007; and that economies in the region (except Malaysia) had their import shares in both EU and US falling in the same period (Table 1.8).

Table 1.8: Import Share of East Asian Economy in East Asia, EU, and US, 2000 and 2007

(%)

	Source					
	East Asia		EU		US	
	2000	2007	2000	2007	2000	2007
Hong Kong, China	70.2	74.0	8.9	7.8	6.8	4.9
Indonesia	48.7	57.1	12.5	10.0	10.1	6.4
Japan	36.0	39.2	11.0	9.6	19.1	11.6
Malaysia	56.7	59.1	9.6	10.6	16.8	10.8
Philippines	48.6	52.8	11.2	9.4	18.4	14.0
PRC	46.0	46.5	10.6	10.3	9.9	7.3
Republic of Korea	39.9	43.3	9.6	9.5	18.2	10.5
Singapore	53.4	51.7	10.8	10.7	15.1	12.4
Thailand	52.9	55.1	9.8	7.5	11.8	6.7

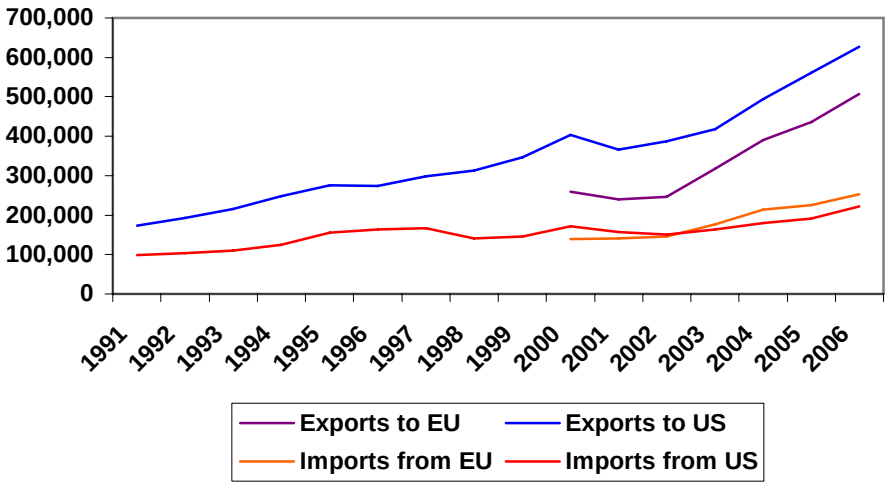
PRC = People's Republic of China.

Note: Import share is the percentage share of East Asian economy's total imports coming from source economy to the economy's total imports from the world.

Source of basic data: United Nations Comtrade Database.

Although East Asian economies registered declines in their export and import shares with respect to both EU and US, the region's total exports to and imports from the EU and US were still going up, with sharper hikes in more recent years, particularly starting 2002 (Figure 1.7). This may suggest that amidst rising intra-regional trade in East Asia, the region still considers both EU and US as major export markets. In general, emerging markets still looked at industrial economies, in particular, the US, as a final export destination (Brooks and Hua 2008). For instance, it has been documented that around 60% of Asian exports are final consumption goods in industrial economies like EU, Japan, and the US (ADB, 2007a). As a large chunk of intra-regional trade in East Asia is in parts and components and more generally, intermediate goods, due to regional production networks, about half of this is spurred by demand outside East Asia (Brooks and Hua, 2008).

Figure 1.7: East Asia Trade with EU and US, 1991-2006
($ million)



EU = European Union, US = United States.
Source of basic data: United Nations Comtrade Database.

During the 1990s and 2000, majority of East Asia's exports to the US come from Japan but Japan's share in the region's total exports to US fell dramatically over time while PRC's share climbed precipitously, with PRC becoming the largest East Asian exporter to the US (Table 1.9). As for ASEAN-5, its share in the region's exports to US increased during the early to mid-1990s, from 17.4% in 1991 to 24.3% in 1997 but started to drop thereafter reaching 16.5% in 2006.

Table 1.9: Country Share of East Asian Exports to US, by East Asian Economy, 1991-2006
(%)

	1991	1994	1997	2000	2003	2006
Brunei Darussalam	0.0	0.0	0.0	0.1	0.1	0.1
Cambodia	0.0	0.0	0.0	0.2	0.3	0.4
Hong Kong, China	5.6	4.1	3.6	3.0	2.2	1.3
Indonesia	2.1	2.8	3.3	2.8	2.5	2.3
Japan	55.1	49.3	41.7	37.3	29.0	24.2
Korea, Republic of	10.2	8.2	8.0	10.3	9.2	7.6
Lao PDR	0.0	0.0	0.0	0.0	0.0	0.0
Malaysia	3.7	5.8	6.2	6.5	6.3	6.0
Myanmar	0.0	0.0	0.0	0.1	0.1	0.0
Philippines	2.1	2.4	3.6	3.6	2.5	1.6
PRC	11.7	16.6	22.1	26.7	39.1	48.5
Singapore	5.9	6.3	6.8	4.8	3.7	2.9
Thailand	3.7	4.3	4.4	4.3	3.9	3.8
Viet Nam	0.0	0.0	0.1	0.2	1.2	1.5

PRC = People's Republic of China, US = United States.
Source of basic data: United Nations Comtrade Database.

Similarly, majority of East Asian exports to EU initially came from Japan and later shifted to PRC (Table 1.10). Also, ASEAN-5's share in East Asia's exports to EU dropped from 24.9% in 2000 to 17.5% in 2006.

Table 1.10: Country Share of East Asian Exports to EU, by East Asian Economy, 2000-2006

(%)

	2000	2003	2006
Brunei Darussalam	0.1	0.0	0.0
Cambodia	0.1	0.2	0.2
Hong Kong (China)	4.3	3.5	3.0
Indonesia	4.1	3.8	3.0
Japan	32.8	25.8	19.1
Korea, Republic of	9.6	9.3	10.1
Lao PDR	0.0	0.0	0.0
Malaysia	6.5	5.6	4.4
Myanmar	0.1	0.1	0.1
Philippines	3.3	2.5	1.6
PRC	26.6	37.8	48.2
Singapore	6.2	5.3	4.8
Thailand	4.8	4.2	3.6
Viet Nam	1.5	1.7	1.7

EU = European Union, PRC = People's Republic of China.

Source of basic data: United Nations Comtrade Database.

Most East Asian economies have their largest exportable good to the US to be in the form of assembled goods like portable automatic data processing machines (Malaysia, PRC), vehicles (Japan and Republic of Korea), and tricycles and toys, etc. (Hong Kong, China), with Japan's vehicles and PRC's portable automatic data processing machines serving as the two largest export items to the US (Table 1.11). It is worthwhile to note that Japan's large vehicle exports to the US is attributed to the Japanese automobile sector's continued productivity growth, strong profitability, and expanding market share, unlike its US competitors (Nordås, 2008).

Table 1.11: Top Exports of East Asian Economies to the US, by HS 6-digit Commodity Classification, 2007

	HS Code	HS 6-digit Commodity Classification	Value (US$ billion)	Share in Economy's Total Exports to US (%)
Hong Kong, China	HS-950300	Tricycles, scooters, pedal cars & similar wheeled toys; dolls' carriages; dolls; other toys; reduced-size ("scale") models & similar recreational models, working/not; puzzles of all kinds.	1.7	3.6
Indonesia	HS-400122	Technically specified natural rubber (TSNR).	1.2	10.6
Japan	HS-870324	Vehicles, principally designed for the transport of persons, with spark-ignition internal combustion reciprocating piston engine, of a cylinder capacity >3000cc.	21.3	14.6
Malaysia	HS-847130	Portable automatic data processing machines, weighing not more than 10 kg, consisting of a least a central processing unit, a keyboard & a display.	6.1	22.1
Philippines	HS-999999	Commodities not specified according to kind.	1.7	20.0
PRC	HS-847130	Portable automatic data processing machines, weighing not more than 10 kg, consisting of a least a central processing unit, a keyboard & a display.	15.5	6.7
Republic of Korea	HS-870323	Vehicles principally designed for the transport of persons, with spark-ignition internal combustion reciprocating piston engine, of a cylinder capacity >1500cc but not >3000cc.	5.7	12.4
Singapore	HS-854239	Other Electronic integrated circuits, other than Amplifiers/Memories/Processors & controllers.	5.0	18.7
Thailand	HS-847170	Storage units.	1.8	9.5

EU = European Union, HS = Harmonized System, PRC = People's Republic of China.

Note: No data for Brunei Darussalam, Cambodia, Lao PDR, and Viet Nam.

Source of basic data: United Nations Comtrade Database.

Portable automatic data processing machines (from PRC), telephones (Republic of Korea), and vehicles (Japan) are the top three largest export items of East Asia to the EU (Table 1.12). Certain parts and components would serve as the largest exportable good to the EU for other East Asian economies like Hong Kong (China), Malaysia, and the Philippines.

Table 1.12: Top Exports of East Asian Economies to the EU, by HS 6-digit Commodity Classification, 2007

	HS Code	HS 6-digit Commodity Classification	Value (US$ billion)	Share in Economy's Total Exports to EU (%)
Hong Kong, China	HS-847330	Parts & accessories of automatic data processing machines and units thereof; magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data, not elsewhere specified or included.	0.8	5.0
Indonesia	HS-260300	Copper ores & concentrates.	1.0	5.5
Japan	HS-870332	Vehicles principally designed for the transportof persons, with C-I internal combustion piston engine (diesel/semi-diesel), of a cylinder capacity >1500cc but not >2500cc.	5.5	5.2
Malaysia	HS-847330	Parts & accessories of automatic data processing machines and units thereof; magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data, not elsewhere specified or included.	3.7	15.3
Philippines	HS-847330	Parts & accessories of automatic data processing machines and units thereof; magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data, not elsewhere specified or included.	1.1	14.1
PRC	HS-847130	Portable automatic data processing machines, weighing not more than 10 kg, consisting of a least a central processing unit, a keyboard & a display.	19.0	6.0
Republic of Korea	HS-851712	Telephones for cellular networks/for other wireless networks, other than line telephone sets with cordless handsets.	7.2	13.4
Singapore	HS-292250	Amino-alcohol-phenols, amino-acid-phenols & other amino-comps. with oxygen function.	3.1	12.4
Thailand	HS-847170	Storage units.	1.7	7.5

EU = European Union, HS = Harmonized System, PRC = People's Republic of China.

Note: No data for Brunei Darussalam, Cambodia, Lao PDR, and Viet Nam.

Source of basic data: United Nations Comtrade Database.

Clearly, PRC plays a crucial role in the extra-regional trade of East Asia, particularly with developed economies like EU and US. In fact, PRC is a major East Asian supplier of assembled goods to these developed markets, with large amount of the parts and components of these goods coming mostly from East Asian economies. This implies that PRC is the hub in East Asia in terms of the assembly of final goods while other East Asian economies are specializing in the assembly of parts and components (Athukorala and Kohpaiboon, 2008). Given this, PRC is put in a unique position in terms of mediating economic shocks that originate in developed economies and transmitted to East Asia (Brooks and Hua, 2008).

Chapter 2: Trends in Foreign Direct Investment in East Asia*

1. Introduction

Among the key factors that have been credited for the rapid economic growth of the East Asia region in recent decades are the tremendous improvement in the twin areas of trade and foreign direct investment (FDI). From a base of 13.2% of world trade in 1980[3], the share of East Asia to world trade nearly doubled to 23.2% in 2005[4]. On the other hand, regional FDI total flows increased from 6.1% of world FDI flows in 1980[5] to 14.5% in 2005[6]. Some of the striking features of East Asia's emergence as a trading and investment region include: (i) the increasing importance of intra-regional trade, especially in intermediate goods; (ii) the rise of China in particular, as a source and destination of FDI for the region and the world; and (iii) the decreasing dependence on the United States (US) and the European Union (EU) as traditional markets for the region's products and services and source of foreign investment (Aminian, Fung and Iizaka, 2007; Kawai and Wignaraja, 2007; Hattari and Rajan, 2008).

This expansion in trade and FDI in the region can be traced to the following key factors: (i) deregulation and liberalization reform in trade and investment under the General Agreement on Tariffs and Trade, the World Trade Organization, and the Asia-Pacific Economic Cooperation; (ii) the rise and improved integration of production networks[7] that paved the way for specialization of the international work force based on comparative advantage and the emergence of vertical integration in trade in components, other intermediate goods and final products; (iii) enhanced service support and linkages that drastically lowered communication, transportation and other costs, thereby, facilitating the formation and sustainability of production networks and cross border trade and investment; (iv) the rise of China as the principal growth center and trade market in the region; and (v) the robust macroeconomic climate and the advantages bought about by the region's abundant supply of low cost, well-educated and skilled labor that characterize many of the labor markets in East Asia (Danareksa Research Institute, 2004; Koike, 2004; Aminian, Fung and Iizaka, 2007; Kawai and Wignaraja, 2007).

In view of the prevailing trend in trade and FDI in East Asia, this paper will focus on the pattern of FDI in the region from 1995–2005. The emergence of extensive production networks in East Asia will be used as basis for the development in trade activity and foreign capital flows in the region. Indeed, the close association between trade and FDI as mutually reinforcing factors of economic growth has been facilitated by the expansion in the number of MNEs and its affiliates to reach 65,000 and 850,000 in 2002, respectively, and the breadth of MNE coverage to include the entire array of manufactured goods and services. Because different segments of the production line are outsourced to various locations to avail of cost savings and efficiency gains, trade prospects improve for countries that offer locational advantages in factor endowments, thus, strengthening the complementary link between trade and investment (Sakakibara and Yamakawa, 2003). For the most part, production processes that are located abroad involve

* Research assistance provided by Ranier Macatangay is greatly appreciated.
[3] Composed of 12.9% of world merchandise exports and 13.4% of world merchandise imports.
[4] Composed of 24.7% of world merchandise exports and 21.7% of world merchandise imports.
[5] Composed of 6.9% of world FDI inflows and 5.4% of world FDI outflows.
[6] Composed of 16.6% of world FDI inflows and 12.1% of world FDI outflows.
[7] First formulated by multinational enterprises (MNEs) and later on by business firms in the East Asia region, production networks refer to all the components of the entire production process of a final good or service, which is subdivided into several activities and undertaken in various countries or regions where it can be completed at minimum cost (Aminian, Fung and Iizaka, 2007).

labor-intensive or highly skilled labor requirements, such as those found in selected sectors, such as electronics, garments and automotive (Castillo, 2007).

2. Determinants of FDI

The increasing popularity of East Asia as a preferred destination hub for FDI reflects the success of the region in attracting foreign investment despite stiff competition from neighboring and developed countries. The tight race for external capital infusion is based on theoretical considerations (e.g., Solow 1956) and empirical evidence (e.g., Prasad, Rajan, and Subramanian, 2006 in the case of industrialized countries) that the build-up of capital leads to economic growth due to its potential benefits to affiliate firms in host countries (e.g., increased capital stock to supplement scarce local resources to fund new investment, innovation and technology transfer and diffusion, export promotion, development of management expertise, productivity enhancement, job creation, market access, etc.) (Nakamura and Oyama, 1998; Kohpaiboon, 2003; Sakakibara and Yamakawa, 2003; Baliamoune-Lutz, 2004). These in turn help in strengthening the competitive edge of subsidiary firms in host countries and the flagship enterprise in the home country, shifting the employment structure towards more efficient firms (Jackson, 2007).

However, inward FDI is not without cost. The negative economic, environmental and other impacts associated with the injection of foreign capital to recipient economies include higher than normal profits by MNEs, a sizeable portion of which is plowed back to the flagship company in their respective home country and not reinvested in host countries; minimal local content of products manufactured or assembled in host countries due to heavy reliance on imported inputs; unfair business practices, such as transfer pricing; export of “dirty” industries that degrade the environment in host countries, etc. (The Benefits of Foreign Direct Investment to Third World Host Countries, n.d.). Despite these potential costs of FDI, economies around the world continue to vie for foreign capital as an important vehicle for economic growth.

Aside from the advantages that host countries have to offer in terms of factor endowments and less stringent laws on the environment and labor, additional incentives on taxes, finance and regulation are offered by potential recipient countries to investors in an attempt to tip the scale in their favor. Since globalization may have shifted priorities of MNEs away from “market-seeking and resource-seeking FDI to more (vertical) efficiency-seeking FDI” and given the “wider range of choices on how to serve international markets, gain access to immobile resources and improve efficiency of production systems”, potential recipient countries are now assessed on the basis of a more extensive and stringent selection criteria than ever before (Nunnenkamp, 2002). Beyond the basic incentives, which have been observed to be similar across locations and which seem to be more important for certain types of industries that are wanting to locate in certain areas (e.g., electronics in Indonesia and metal manufacturing in Thailand), are more important considerations that investors take into account when choosing the destination location for their surplus capital funds (Aldaba, 1995 as cited in Castillo, 2007 and Yeung, 1996 as cited in Castillo, 2007; Castillo, 2007).

In particular, because of the expansion of production networks in the East Asia region, non-traditional FDI factors (e.g., locational cost advantages between recipient and donor country, especially in terms of labor cost and the cost of doing business, including the cost of corruption; quality of infrastructure and availability of skilled manpower pool; political stability as an indicator of risk, level and volatility of exchange rate, etc.) may have gained greater importance relative to established FDI determinants, notably market size, as an indicator of demand and economies of scale (UNCTAD, 1996 as cited in Nunnenkamp, 2002). However, the verdict is not conclusive

on this argument with various studies providing empirical evidence on the shift in significance of FDI determinants towards non-traditional factors (e.g., Hood and Young, 1987 as cited in Tayyebi and Hortamani, 2007; Noorbakhsh, Paloni and Youssef, 2001) or the continued dominance of market-related factors (e.g., Clegg and Green, 1999 as cited in Tayyebi and Hortamani, 2007; Nunnenkamp, 2002) or the importance of both traditional and non-traditional factors in determining FDI flows (Kim and Oh, 2007). Thus, whether MNE investments abroad are driven by proximity to markets, lower cost, or other considerations, fierce competition for international capital continues to rage with the intraregional dimension gaining increased prominence as an indispensable component of sustained growth and integration in East Asia.

3. Trends in FDI in East Asia[8]

FDI Inflows in East Asia

World FDI inflows increased almost threefold from $342.5 billion in 1995 to $945.8 billion in 2005 or an equivalent average growth rate of 10.7%, exceeding world GDP and trade growth rates of 4.3% and 7.4%, respectively (Table 2.1). Developed economies led by the European Union (EU) and the United States (US) continue to serve as primary recipients of FDI. However, the combined shares of the two lead economies in FDI inflows declined from a high of 71.7% in 1999–2000, respectively, to 63.2% of global inward FDI estimated at $945.8 billion in 2005. The strong growth of FDI worldwide during the 1999–2000 period was for the most part associated with a surge in international funds from cross border mergers and acquisitions (M&A) in the high tech and telecommunications sectors in developed countries, which was aided by the robust performance in the equity market (Wong and Adams, 2002).

On the other hand, shares of the economies in East Asia increased from 10.2% of world inward FDI in 2000 to 16.6% in 2005, with record high levels in foreign investment reaching $156.9 billion in 2005, more than twice its value of $73.2 billion a decade before. The +3 countries of the region, composed of China including the economy of Hong Kong, Korea and Japan showed the largest gains in FDI inflows of 3.7% as a share of world inward FDI in 2000–2005. The more developed countries/economies in East Asia led by China, has consistently accounted for nearly half of the region's inflows since 1995, followed by Hong Kong and Singapore as preferred FDI destinations, with shares of 21.4% and 9.6% in 2005, respectively. Jointly, these three countries account for 77.1% of the region's FDI inflows in 2005. This represents a slight increase over 1995 shares of 75.5%.

While the EU and US continue to dominate FDI inflows in terms of magnitude, the East Asia region has emerged as one of the principal growth centers with an average growth rate of 7.9%, particularly during the second half of the 1995–2005 period, posting a positive growth rate of 1.8% from 2000–2005 compared to the world average growth rate of -7.7%. The robust FDI trend in the region has been principally influenced by the following: (i) the transfer of production processes of Japanese companies to the region due to the sharp increase in the value of the yen following the Plaza Accord in 1985, and the succeeding appreciation of currencies and the shift in comparative advantage among the newly industrialized countries in Asia during the late 1980s; (ii) the implementation of globalization measures by manufacturing firms in the region to improve their competitiveness in response to the initiation of China as a formidable force in the global production chain; and (iii) improved investment climate resulting from the good

[8] Composed of Brunei, Cambodia, China, Hong Kong, Indonesia, Japan, Korea, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam.

Table 2.1: FDI Inflows, 1995–2005
($ Million)

Country/ Economy	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Brunei Darussalam	539.8	553.4	698.7	588.9	735.5	529.0	517.7	1,011.3	3,299.2	330.3	253.9
Cambodia	150.7	293.7	168.1	223.0	223.1	141.9	142.1	139.1	74.3	121.2	374.9
China	35,520.5	39,611.5	42,694.6	42,828.9	38,544.4	39,799.0	39,992.2	50,224.5	50,650.4	55,132.0	60,144.8
Hong Kong	-18,786.6	-16,070.7	-13,038.7	-2,219.7	5,209.1	2,572.0	12,431.5	-7,781.1	8,132.0	-11,684.1	6,416.6
Indonesia	3,027.0	5,594.0	4,500.0	-285.0	-1,937.0	-4,700.0	-3,103.4	-36.7	-809.6	-1,512.0	5,272.0
Japan	-22,588.8	-23,198.4	-22,768.6	-20,959.5	-10,002.0	-23,234.8	-32,091.9	-23,041.3	-22,475.9	-23,135.5	-43,005.7
Korea	-2,305.3	-2,657.7	-1,808.0	332.8	5,684.9	4,003.3	1,710.2	778.5	958.0	4,322.4	2,751.4
Lao PDR	83.6	124.6	84.0	42.3	50.6	29.9	24.9	25.0	19.4	16.9	27.7
Malaysia	3,327.0	3,529.0	3,648.0	1,851.0	2,472.9	1,761.6	287.1	1,298.7	1,103.7	2,562.9	992.4
Myanmar	317.6	580.7	878.8	683.6	304.0	208.0	192.0	191.4	291.2	251.0	235.8
Philippines	1,361.0	1,338.0	1,113.0	1,592.0	1,114.0	2,115.0	335.0	1,477.0	188.0	109.0	1,665.0
Singapore	4,748.0	1,731.2	2,849.1	5,148.9	8,575.4	10,569.1	-4,343.9	4,871.3	8,969.3	11,754.5	9,969.4
Thailand	1,183.0	1,406.0	3,298.0	7,360.0	5,742.0	3,371.0	4,631.0	3,164.0	4,614.0	5,786.0	8,405.2
Viet Nam	1,780.4	1,803.0	2,587.3	1,700.0	1,483.9	1,289.0	1,300.3	1,200.1	1,450.0	1,610.1	1,956.0
EU	-27,178.4	-58,653.7	-81,336.4	-137,244.8	-222,652.9	-114,270.8	-51,442.9	43,663.8	-25,705.8	-145,557.9	-112,323.1
US	-33,302.0	34.0	7,636.7	43,434.8	74,285.4	171,371.2	34,604.6	-60,445.4	-76,211.5	-122,117.2	128,797.3
World	**-20,659.3**	**-4,966.5**	**6,164.6**	**12,251.6**	**-9,457.9**	**172,175.8**	**87,088.0**	**81,280.7**	**3,991.5**	**-135,157.7**	**108,601.6**

Source: UNCTAD (2006).

transactions record by cross border M&A; liberalization measures carried out by countries in the region (e.g., Viet Nam and Indonesia); robust economic growth; reinvestment of revenues (i.e., more than 40% of FDI inflows in Indonesia, Malaysia, Singapore and Thailand are from reinvested earnings); and improved foreign investment inflows from countries within the region (Wong and Adams, 2002; UNCTAD, 2008).

Growth in FDI inflows in East Asia from 2000–2005 was led by the ASEAN[9] subregion with a remarkable growth rate of 11.8% from -3.5% in 1995–2000. Within the ASEAN, growth was strongest within Greater Mekong Subregional Economic Zone (GMS)[10] with an average rate of 18.2% from 2000–2005 from 2.7% in 1995-2000 or 10.2% for the period covering 1995–2005. This reflects the serious efforts, strong commitment and the progress made by the GMS member countries since 1992 in forging an environment of regional cooperation, integration and growth through social and economic reform and liberalization among the riparian countries that surround the Mekong River, particularly in the following priority areas: transport, telecommunications, energy, tourism, human resources development, environment, agriculture, trade and investment. Strategies to encourage cross border cooperation and growth include infrastructure and capacity building projects, agreements to facilitate trade in goods and services, etc. (Krongkaew, 2004).

Among the GMS member countries, Thailand posted the highest growth in inward FDI, averaging 15.8% from 1995–2005 with a better performance figure of 21.7% from 2000–2005. In 2005, United Nations Conference on Trade and Development (UNCTAD), in its *Global Investment Assessment Report*, ranked Thailand as the third best business location in the Asia and the Pacific for 2005–2006, next to China and India. Likewise, the Institute for Management Development placed Thailand in ninth position in terms of competitiveness among 60 of the key economies in the world from a rank of 11 in 2002 (Tables 2.2 and 2.3). The main investors in Thailand were Japan, EU, Switzerland, US, Taiwan, Hong Kong, Singapore and Malaysia.

The country's strong competitive edge among its East Asian neighbors and other countries in the global economy is a product of the continued efforts by the Thai government to restructure the country's financial and corporate sectors and regain its industrial competitiveness, following the financial crisis in 1997–1998 (Brimble, 2002). The Thai government is serious about further improving the country's FDI performance and encouraging investment in other sectors of the economy (e.g., pharmaceuticals, business process outsourcing, alternative energy, and electrical and electronics) through incentives (Embassy of Denmark, Bangkok, n.d.).

Second in rank among the GMS countries is Cambodia with an average growth rate of 9.7% in 1995–2005. Gains in inward FDI were registered exclusively during the second half of the decade with an average growth rate of 20.7% from -0.3% in 1995–2000. What makes Cambodia's FDI growth performance remarkable is that it is a relatively latecomer in the field since political stability was achieved only a decade and a half ago, after the general elections in 1993, and the country is considered to be among the poorest among the GMS member economies[11] with GDP per capita of $447.9 in 2005. The country's FDI came mainly from the

[9] Composed of Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam.

[10] Composed of Cambodia, Lao PDR, Myanmar, Thailand, Viet Nam and Yunnan Province of China but for purposes of this paper, the GMS subregion will exclude the Yunnan Province of China.

[11] Also included among the poorest countries in the GMS are Laos and Myanmar. On the other hand, Thailand, Viet Nam and the Yunnan Province of China are considered to be the wealthier members of the GMS.

following countries: Malaysia, Taiwan, China, Korea, US, Hong Kong, Thailand, Singapore, France and UK. Cambodia's success in attracting FDI is a reflection of the headway that the country has achieved in carrying out a strategy of growth and development that is hinged on "maintaining macroeconomic stability, strengthening the banking and financial institutions, implementing fiscal measures, ensuring a sound management of public property, and increasing public and private investment to development the physical and social infrastructure and human resource" (Thoraxy, 2002).

Table 2.2: Best Business Locations in Asia and the Pacific, 2005–2006

1. China
2. India
3. Thailand
4. Korea
5. Malaysia
6. Indonesia
7. Viet Nam
8. Singapore

Source: UNCTAD (2005).

Table 2.3: Competitiveness Ranking of 60 Key Economies, 2005

1. US
2. Canada
3. Australia
4. Taiwan
5. Zhejiang, China
6. Japan
7. United Kingdom
8. Germany
9. Thailand
10. Malaysia

Source: Institute for Management Development (2005).

Also worth noting is the improved FDI growth performance of Viet Nam from -6.3% in 1995–2000 to 9.4% in 2000–2005 or an average annual growth rate of 1.3% for the decade. Unlike Cambodia, where a significant portion of FDI is sourced from Malaysia (40%), foreign investors in Viet Nam are quite dispersed (i.e., Singapore, Taiwan, Japan, South Korea, Hong Kong, France, BV Islands, Netherlands, Russia and UK) with each having less than 19% shares of total FDI inflows, making it more resilient to economic shocks from a particular location (Freeman, 2002). Lao PDR and Myanmar, which are among the poorest countries in the GMS[12], lag behind in inward FDI with a growth rate of -11.0% and -2.9% in 1995–2005, respectively.

In contrast to the strong FDI showing by the GMS subregion, the worst growth rate among the subgroupings in East Asia was registered by the Brunei, Indonesia, Malaysia, Philippines and Singapore cluster, otherwise known as BIMPS, with a record low growth performance figure of 2.2% from 1995–2005, from -4.9% during the first half of the decade and then picking up to

[12] Defined in terms of GDP per capita. GDP per capita of Laos is $480.33 in 2005. Information on and Myanmar is not available.

9.7% from 2000–2005. Indonesia led the cluster with a growth rate of 6.7% in 1995–2005; Singapore and the Philippines registered minor upward adjustments in their inward FDI flows at 2.7% and 2.2%, respectively; while Brunei and Malaysia were the laggards in the BIMPS subgrouping with growth rates of -6.8% and -3.8%, respectively.

On the other hand, despite the double-digit growth performance of FDI inflows to China, all other countries/economies in the +3 subregion of East Asia, including the economy of Hong Kong, recorded negative growth rates ranging from -4.8% in the case of Korea to -19.7% for Japan, or an average growth rate of -0.7% for the +3 subregion including Hong Kong in 2000–2005, from a peak of 21.7% during the previous five-year period.

By country/economy, growth was highest in the +3 countries of the ASEAN and economy of Hong Kong with average growth rates of 6.8% for China, 18.9% for Hong Kong, 52.2% for Korea and 18.4% for Japan in 1995–2005. With the exception of China, which registered an even higher growth rate of 12.2% in 2000–2005 compared to 1.6% in 1995–2000, the remaining countries of the +3 subregion including the economy of Hong Kong posted negative growth during the 2000–2005 period.

3.1.1 Sources of FDI Inflow

A snapshot of the top 36 bilateral flows to East Asia (excluding Japan) are shown in Table 2.4. Total FDI received from the top 36 bilateral donors reached $64.5 billion on average in 1997–2000, decreasing slightly to $63.3 billion on average in 2000–2005. Intra-FDI inflows totaled $40.9 billion each in 1997–2000 and 2000–2005, accounting for over 60% of inward FDI among the top donors in the region, implying some sort of “regionalism” or investing in one’s own home territory. Hong Kong was the region’s main source of intra-regional FDI with roughly 45% shares in both periods. Flows from Hong Kong were typically meant for the large China market, raising the issue of round-tripping, which will be discussed in more detail in the next section. The second largest investor in intra-regional FDI was Japan with 19.9% and 29.1% shares in 1997–2000 and 2000–2005, respectively; followed by China with 17.8% and 13.3% shares in 1997–2000 and 2000–2005, respectively; and Singapore with 16.7% and 12.2% shares in 1997–2000 and 2000–2005, respectively. Malaysia also landed among the donors in the top 36 bilateral flows with 0.7% and 0.8% shares in 1997–2000 and 2000–2005, respectively.

Next to East Asia was the US with 14.8% share in FDI donations in 2000–2005, representing a slight decline of 2.1% from its initial funding of $10.9 billion on average in 1997–2000. Third in rank was the EU with $9.3 billion and $8.8 billion worth of investments on average in 1997–2000, respectively, representing shares of 14.4% and 13.8% in 1997–2000 and 2000–2005, respectively. Other contributors included Taipei and Australia with 4.7% and 0.4% shares in 1997–2000, respectively and 6.0% and 0.6% shares in 2000–2005, respectively.

Table 2.4: Top 40 Bilateral Flow to East Asia*, 1997–2005

($ Million)

		Average		% Share	
Donor	**Host**	**(1997–2000)**	**(2001–2005)**	**(1997–2000)**	**(2001–2005)**
Hong Kong	China	17,750.8	17,819.1	16.9%	18.8%
China	Hong Kong	7,266.9	5,459.4	6.9%	5.8%
Japan	China	3,276.2	5,194.5	3.1%	5.5%
US	China	3,774.7	4,107.0	3.6%	4.3%
Taipei	China	2,774.8	3,361.3	2.6%	3.6%
Singapore	China	2,706.3	2,136.7	2.6%	2.3%
Netherlands	Hong Kong	1,929.0	2,011.5	1.8%	2.1%
Japan	Thailand	1,347.0	2,324.9	1.3%	2.5%
Japan	Hong Kong	1,417.6	2,044.6	1.4%	2.2%
US	Hong Kong	1,915.1	1,521.3	1.8%	1.6%
US	Singapore	1,840.4	1,506.5	1.8%	1.6%
Singapore	Hong Kong	2,835.3	353.1	2.7%	0.4%
US	Korea	1,293.6	1,571.4	1.2%	1.7%
Japan	Singapore	1,281.5	1,276.6	1.2%	1.3%
UK	China	1,305.4	893.4	1.2%	0.9%
Germany	China	995.1	1,146.4	0.9%	1.2%
Singapore	Malaysia	844.1	1,133.8	0.8%	1.2%
Netherlands	Korea	1,350.1	573.4	1.3%	0.6%
US	Malaysia	1,429.8	428.8	1.4%	0.5%
Singapore	Thailand	441.7	1,381.9	0.4%	1.5%
Germany	Singapore	486.9	957.0	0.5%	1.0%
Netherlands	China	590.2	801.7	0.6%	0.8%
Japan	Korea	607.8	717.3	0.6%	0.8%
France	China	701.4	594.8	0.7%	0.6%
Germany	Malaysia	316.0	852.2	0.3%	0.9%
Germany	Korea	681.9	248.3	0.6%	0.3%
US	Philippines	658.8	250.5	0.6%	0.3%
Taipei	Hong Kong	268.9	446.6	0.3%	0.5%
Australia	China	278.2	400.7	0.3%	0.4%
UK	Thailand	273.9	363.5	0.3%	0.4%
Japan	Philippines	232.9	377.5	0.2%	0.4%
Malaysia	China	290.8	316.7	0.3%	0.3%
Hong Kong	Malaysia	272.3	296.5	0.3%	0.3%
Hong Kong	Thailand	360.1	160.8	0.3%	0.2%
France	Singapore	303.8	211.5	0.3%	0.2%
France	Korea	383.2	97.4	0.4%	0.1%

*Excludes Japan.

Source: Hattari and Rajan (2008).

3.1.2 The Rise of China as a Favored FDI Destination

The ascent of China from a small player in international economic affairs to a major player in the world economy and one of the most sought after FDI destinations, if not the premiere FDI destination in the world, particularly for labor-intensive manufacturing processes, is nothing short of phenomenal. As part of the country's gradual transition from a closed economy to a more market-oriented system, China started opening its economy to international trade and foreign investment in 1979, but was limited to joint venture investments with state-owned and controlled enterprises targeting the export market (e.g., garments requiring low technology and soft goods) (US-China Business Council, 2006; Chinability, n.d.). As a result, the inflow of FDI during the 1980s remained below the $3.0 billion mark on average, owing to restrictions placed on joint ventures with regard access to the China market, utilization of foreign exchange and export output requirements (Table 2.5).

Table 2.5: Average FDI Inflows to China and Growth Rates, 1980–2005

Description	1980–1985	1985–1990	1990–1995	1995–2000	2000–2005
FDI Inflows ($ Million)	840.5	2,764.4	19,610.5	41,833.2	54,479.4
AAGR	102.8%	12.3%	60.8%	1.6%	12.2%

Source: UNCTAD (2006).

During the 1990s, earlier restrictions on foreign investment were reduced to further economic reform. For example, fully-owned auxiliary establishments of foreign firms were allowed in China starting in 1992. Also, as part of the government strategy to encourage investment in the country's manufacturing industry, international firms were now allowed to invest in the manufacturing sector and make quite an extensive array of these products available in the domestic market. In particular, the government started opening up the economy to manufacturing FDI in capital intensive (e.g., chemical and petroleum processing) and technology intensive products (e.g., electronics). In the case of the latter, this resulted in the natural formation of industrial clusters in effort to improve the national competitive advantage (e.g., laptop manufacturing cluster in Shanghai and its nearby localities) and which in some cases, stimulated the relocation of large electronic manufacturing firms and their suppliers to China, such as the case of Nokia in the Xingwang Industrial Park in Beijing. (US-China Business Council, 2006). As a result, China's FDI inflows are concentrated in manufacturing (e.g., transportation equipment, electronics and electronics products, telecommunications equipment, and chemicals industries), accounting for over 70% of FDI. Hong Kong, Taiwan, Singapore and Japan continue to be the primary investment sources of FDI in manufacturing with the lion's share (60%) accounted for by Hong Kong (Wei, 2000 as cited in Castillo, 2007).

Although some critiques allege that the concentration of FDI in manufacturing was made at the expense of service sector except for real estate, due to restrictions imposed by the government of China, a reversal in trend has been observed in some of the service industries (e.g., banking and insurance sectors), which experienced an influx in FDI since they were opened to overseas enterprises after China's accession to the WTO. However, certain sectors in the service industry (e.g., education, culture, arts, radio, film, and television broadcasting) continue to be plagued by restrictive regulations on foreign investment and as a result have not been successful in attracting as much FDI (US-China Business Council, 2006).

Side by side with economic reform, the country likewise took great strides in revving up its investment climate through infrastructure upgrading, manpower development and the

establishment and strengthening of industry clusters as a strategy to improve productivity and enhance competitiveness (Castillo, 2007; Chinability, n.d.). Investor response to these changes was overwhelmingly positive, resulting in a more than threefold increase jump in FDI inflows from an average of $2.7 billion in 1985–1990 to $19.6 billion in 1990–1995 or an improvement of nearly 400% in average annual growth rate from 1990–1995 (60.8%) compared to 1985–1990 (12.3%).

Although the succeeding period continued to witness a rise in FDI intake averaging $41.8 billion from 1995–2000, FDI growth slowed down substantially to 1.6% from its previous double-digit or even triple-digit growth rates from 1980-1995. Nonetheless, inward FDI continue to pour into China with an average value $54.5 billion from 2000–2005 and with the growth rate picking up to register double-digit values at 12.2%, nearly matching the growth rate posted in 1995–2000 at 12.3%. In 2003, China ($53.5 billion) surpassed the US ($53.1 billion) in terms of FDI inflows. By the end of 2005, FDI inflows reached $60.1 billion, bringing cumulative investment from foreign sources to $622.4 billion and other side benefits to the Chinese economy (e.g., 27% of value added, 20% of domestic tax collection and more than 58% of trade) (US-China Business Council, 2006).

The key ingredients behind China's success in attracting foreign capital investment and the relocation of production processes of MNEs in developed countries into its economy, particularly after its accession to the WTO in December 2001, are the combined advantages of a large market, cheap and skilled labor; well-developed supply chain; heavy public sector investment in infrastructure; and robust macroeconomy (Wei, 2000 as cited in Castillo; Sakakibara and Yamakawa, 2003). While the WTO concerns trade-related issues, part of the requirements of China's accession to the WTO includes the elimination of specified limitations on trade-related investment (e.g., domestic content requirement, foreign exchange balancing, technology transfer and restrictions on foreign investment in certain sectors of the economy) and the provision of national treatment to foreign investors from WTO member countries. This has "helped chart a course to a more transparent, rules-based trade and investment environment" in China (US-China Business Council, 2006). Notwithstanding the progress made in these areas, foreign investment in China continue to be challenged in particular by poor enforcement of regulations, especially in the area of intellectual property (US-China Business Council, 2006).

However, the rise of China as a major host of FDI has raised two important issues on whether (i) China's inward FDI values are overstated due to round tripping, whereby capital originally from China is channeled through a foreign country and then returned to its country of origin under the guise of foreign investment in order to avail of FDI incentives (FDI Magazine, 2004; US-China Business Council); and (ii) the inflow of FDI to China, particularly from the EU, has taken away funds from the developing economies in the ASEAN subregion (Liu et al., 2006). In the case of the former, estimates made by a study from Singapore's Ministry of Trade and Industry in 2002 claim that FDI inflows to China are bloated by at least 25% as a result of round tripping of investments that actually accrue from private individuals and/or firms in China or Chinese firms in Hong Kong or Taiwan. The same source also opines that round tripping is likely to have risen since 1992 during the second wave of FDI reforms introduced by Deng Xiaoping earlier that year. According to the World Bank (2002), round tripping estimates can go as high as 50% of official FDI values, putting the true value of inward FDI to China at $20 billion in 1999 and not $40 billion, as reflected in the country's official estimates from the Ministry of Commerce (FDI Magazine, 2004). It is estimated that Mainland China investments channeled through Hong Kong account for at least 10% or at most 30% of investments made by Hong Kong firms to the Chinese mainland (US-China Business Council, 2006).

Supporting evidence on the use of offshore vehicles as a means of recycling investments back to China is provided by the fact that the outflow of foreign investment from China corresponds to the increase in inward foreign capital to some of the country's top investment sources, namely, Hong Kong, China's largest foreign capital investor and accounts for 29.8% of the mainland China's total utilized FDI of $60.3 billion and 41.7% of the country's total cumulative FDI of $622.4 billion in 2005, the British Virgin Islands, China's second largest FDI source with 15.0% and 7.4% of the country's inward FDI and total cumulative FDI in 2005, respectively; the Cayman Islands with 3.2% and 1.4% of the country's inward FDI and total cumulative FDI in 2005 and Bermuda, which is also a major foreign investor in China (Table 2.6). Moreover, China's abnormally large unrecorded capital flows as reflected in balance of payments estimates under errors and omissions likewise match the year to year difference in FDI intake to some of these popular offshore financial and tax shelters of the country (FDI Magazine, 2004).

Table 2.6: Top 10 Sources of Utilized FDI in China, 2005
($ Million)

Country/Region of Origin	Utilized FDI	Cumulative FDI
Hong Kong	17,949.0	259,523.0
Virgin Islands	9,022.0	45,917.0
Japan	6,530.0	53,376.0
Korea	5,168.0	31,103.0
United States	3,061.0	51,090.0
Taiwan	2,152.0	41,756.0
Cayman Islands	1,948.0	8,660.0
Singapore	2,204.0	27,743.0
Western Samoa	1,352.0	5,785.0
Germany	1,530.0	11,439.0
Total	**60,325.0**	**622,426.0**

Source: PRC Ministry of Commerce as cited in US-China Business Council (2006).

The surge of FDI from Hong Kong to China can be traced to the alignment of foreign enterprises with Hong Kong firms before China's accession to the WTO in 2001, as an entry point to the Chinese market. However, after China's entry to the WTO and the accompanying reforms that the country instituted to improve the investment climate, as part of the requirements of the WTO agreement, international companies have increased direct investments to mainland China with Shanghai as a formidable regional investment hub to Hong Kong. On the other hand, international firms located in the member countries of the Organization of Economic Cooperation and Development, Taiwan and the mainland China, have utilized special utility vehicles listed in popular tax haven destinations, such as the British Virgin Islands, the Cayman Islands and Western Samoa, as a way of directing or redirecting funds to China as FDI (US-China Business Council, 2006).

For the most part, round tripping is driven by the liberal tax allowances offered by the Chinese government to foreign investors. For example, foreign firms are given a tax holiday for two years after earning positive returns and then are charged only 50% of corporate taxes, normally pegged at 33% for local firms, for the next three years. Offshore havens in Hong Kong and the Caribbean "provide tax exemptions on dividends and offshore earnings, confidentiality, fast and easy procedures for setting up a company and an established legal system" (FDI Magazine, 2004). Thus, despite WTO regulations prohibiting such privileges to foreign companies, this practice is likely to continue at least in the near future since offshore vehicles afford foreign

ventures with benefits that reduce cost or facilitate transactions, which they would not otherwise enjoy under normal circumstance (FDI Magazine, 2004).

Another motivation for round tripping is to get around the numerous laws and restrictions imposed on FDI. One such case involves the prohibition against foreign firms from investing in some of sectors of the country's telecommunications industry [e.g., internet content providers ICP)]. Thus, foreign-based companies, such as Sina, one of the top ICP in China, has turned to offshore companies in the Cayman Islands to invest in a roundabout way in China's ICP (FDI Magazine, 2004).

Although the utilization of offshore vehicles as a means of recycling investments back to China implies that the FDI performance of the country is not as exceptional as what official estimates reflect, neighboring countries from the ASEAN continue to worry about losing out on foreign capital investments in favor of China. A case in point is the diversion of FDI inflows from the electronics sector of Malaysia to China, leaving only an eighth ($554 million) of original inward FDI values that the country used to achieve (Sakakibara and Yamakawa, 2003). Concern over FDI diversion is a sensitive issue among countries because of the important influence of FDI on economic growth and regional economic integration through its impact on capital formation (Dennis and Yusof, 2003; Liu 2006; Kawai and Wignaraja, 2007). The verdict on this particular issue is still up in the air with various studies providing empirical support for (e.g., Chantasasawat et al., 2004) or against (Liu, 2006) this allegation. In any case, ASEAN countries may find some consolation with the fact that the gap between the share of China as a percentage of world FDI and the combined share from ASEAN member economies as a percentage of world FDI has been narrowing down from margin of 5.6% in 2002, the largest difference in shares between the two economies from 1995–2005, to 3.3% in 2005.

3.1.2 FDI Performance Index

Whether or not certain countries in the region receive large amounts of FDI and in the process divert funds from the rest of the region is an important issue among countries. In an attempt to bring light to this issue, the FDI Performance Index developed by UNCTAD is introduced as an alternate indicator of FDI inflows relative to the size of an economy, as measured by its GDP for a given period. Simply put, the FDI Performance Index is the ratio of the share of an economy relative to world FDI inflows and world GDP for a particular period of time. This implies that ratio greater than one indicates that an economy received more FDI in comparison to size of its economy and is therefore relatively dependent on FDI; a value less than one implies FDI inflows less than the size of its economy and is therefore less reliant on FDI; and a negative ratio implies net outflows of foreign funds by investors.

Table 2.7 clearly shows a declining trend in China's FDI shares relative to its economic size. From a share in world investment nearly fivefold its portion in world income in 1994–1996, the country's FDI shares merely matched the double-digit annual expansion in GDP during the succeeding periods with a resultant FDI Performance Index value of a little over one. While other member economies of the +3 subregion registered either an improvement in the FDI Performance Index value (e.g., Hong Kong) or a slight change in the FDI Performance ratios (e.g., Japan and Korea), all countries in the ASEAN subregion with the exception of Thailand, which registered an improvement of minimal change of 0.037 in its FDI Performance Index value, and Cambodia and Lao PDR, which were not included in the exercise, showed marked reduction in their respective shares in world investment relative to their respective shares in world income, ranging from a low of 1.369 for Philippines to a high of 5.174 for Singapore in the years immediately following the Asian Financial crisis compared to their respective indices in

1994–1996. It is also worth noting that Indonesia was the only country in the region that experienced a divestment in FDI as a result of low investor confidence, following its sluggish recovery from the crisis that afflicted the region in 1997–1998.

Table 2.7: FDI Performance Index of East Asian Countries, 1994–2006

Country/ Economy	1994–1996		1999–2001		2004–2006	
	Rank	Index Value	Rank	Index Value	Rank	Index Value
Brunei Darussalam	7	7.227	7	4.141	64	1.645
Cambodia						
China	16	4.667	56	1.134	75	1.320
Hong Kong	12	5.056	2	6.499	2	9.501
Indonesia	52	1.825	138	-0.624	103	0.752
Japan	133	0.007	130	0.059	137	0.014
Korea	118	0.304	97	0.434	126	0.399
Lao PDR						
Malaysia	9	5.862	71	0.922	67	1.576
Myanmar	32	2.796	83	0.642	101	0.792
Philippines	47	1.895	89	0.526	99	0.811
Singapore	3	10.507	4	5.333	6	7.200
Thailand	78	1.021	59	1.058	54	1.895
Viet Nam	6	8.177	44	1.307	62	1.689

Note: 1994-1996 and 1999-2001: Based on 140 economies.
2004-2006: Based on 141 economies.
Source: UNCTAD

Also apparent from the table is the headway made by the ASEAN subregion towards an improved investment environment through political and economic reforms. FDI Performance Index values for all countries in the region increased by an average of 0.382 relative to their 1999–2000 ratios, with the exception of Brunei Darussalam whose FDI Performance Index declined by 2.496. However, when compared to the FDI Performance Index during the prior decade, the index values for 2004–2006 actually showed a general deterioration in the ASEAN's propensity to attract FDI relative to its size by -2.869 on average. Except for Thailand, which registered an improvement in FDI Performance Index of 0.874 from its index value of 1.021 in 1994–1996, all other countries in the ASEAN recorded a downturn in their FDI performance index ratios, particularly in the case of Viet Nam, Brunei Darussalam, Malaysia and Singapore.

In terms of FDI performance ranking, countries in the ASEAN subregion ranked 29th place on average during the period covering 1994–1996 with several economies, namely, Singapore, Viet Nam, Brunei Darussalam and Malaysia ranking higher than China at 16th place. During the succeeding periods, China dropped to 56th place in 1999–2001 and then to 75th place in 2004–2006. Similarly, countries in the ASEAN subregion fell in ranking from 62nd place on average during the period immediately following the Asian financial crisis, before finally settling to 70th place on average in 2004–2006. Half of the countries in the ASEAN subregion (i.e., Singapore, Thailand, Vietnam, Brunei Darussalam and Malaysia) outperformed China in FDI ranking. On the other hand, the rest of the economies in the +3 subregion maintained its original ranking of

88th place on average in 2004–2006 after a slight improvement in ranking to 76th place on average in 1999–2001.

The preceding discussion provides evidence that although other countries in the East Asia region, particularly those belonging to the ASEAN, have grounds for concern regarding the volume of FDI that China has been able to successfully court to its economy during the past two decades, when taken within the perspective of the country's economic size, China's share of world inward FDI relative to its share in global income, has actually declined more than threefold from its FDI Performance Index value of 4.667 in the mid-1990s and in recent years has simply kept up with the sheer size of its growing economy. After all, China is the region's second largest economy next to Japan. All things considered equal, larger economies, such as China, are likely to attract more FDI by virtue of their larger markets and resource endowments. In the case of the ASEAN, when FDI inflows are scaled by the size of the its economy, its FDI Performance Index value and ranking on average were actually higher than that of China in 2004–2006.

3.2 FDI Outflows in East Asia

Global FDI outflows continued its steady ascent from $363.3 billion in 1995 to peak at 1.2 trillion in 2000 and then bottomed out at $540.7 billion in 2002 (Table 2.8). Outward FDI flows has since recovered slowly reaching $877.3 and $837.2 billion in 2004 and 2005, respectively. Inflows outperformed outflows beginning in 1997–2005 by $36.3 billion on average, except for the brief periods covering the years 1999 and 2004 where outflows exceeded inflows by $9.5 billion and $135.6 billion, respectively (Table 2.9). The largest positive difference between inflows and outflows was recorded at $172.2 billion in 2000, followed closely by $108.6 billion in 2005.

At the regional level, FDI outflows from the East Asia followed an uneven path of upswings and downswings throughout the decade. From $64.8 billion in 1995, outward FDI increased to $71.9 billion in 1997 and then declined to the $50 billion level during the next two years. This was followed by a peak in FDI outflows at $105.1 billion in 2000, only to be followed by a decline in outward investments during the next three years, reaching $45.9 billion in 2003, its lowest level for the decade. During the following two years, FDI outflows came back with a vengeance to levels almost matching those of 2000 at $101.0 billion and $101.5 billion in 2004 and 2005, respectively.

A reversal of the global trend in outward FDI is observed for the East Asian region with outflows consistently surpassing inflows by $36.1 billion on average since 1995. This implies that countries in the region are increasingly becoming investors in other countries. Despite the increase in FDI outflows in the region, its growth rate of 4.6% in 1995–2005 fell short of the world average by nearly 90%. Also worth noting is that although growth rates in outward FDI contracted both at the regional and global levels during the latter half of the decade, the reduction in average FDI growth in East Asia (-0.7%) was smaller compared to that of the world (-7.5%).

By source, the EU by far was the dominant investor in the world, accounting for 72.8% of total FDI outflows in 2005. Second was the US with shares almost reaching the 20% range except in 2005 when outward FDI was negative. East Asia contributed 12.1% to world FDI outflows during the same period. Within the East Asia region, the +3 countries including the economy of Hong Kong accounted for 73.2% of the region's total FDI outflows while the rest of the international funds were sourced from the ASEAN subregion.

Table 2.8: FDI Outflows, 1995–2005
($ Million)

Country/ Economy	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Brunei Darussalam	43.0	100.2	3.1	-15.6	12.1	20.1	8.7	24.0	75.7	4.1	34.6
Cambodia	0.0	0.0	0.0	19.8	9.1	6.6	7.3	6.0	9.7	10.2	6.3
China	2,000.0	2,114.0	2,562.5	2,633.8	1,774.3	915.8	6,885.4	2,518.4	2,854.7	5,498.0	12,261.2
Hong Kong	25,000.0	26,530.9	24,406.8	16,984.6	19,369.0	59,352.0	11,345.0	17,463.0	5,491.6	45,715.8	27,201.3
Indonesia	1,319.0	600.0	178.0	44.0	72.0	150.0	125.0	181.8	212.7	3,408.0	3,065.0
Japan	22,630.3	23,426.4	25,992.8	24,151.9	22,743.1	31,557.6	38,333.2	32,280.6	28,800.3	30,951.2	45,781.1
Korea	3,552.0	4,670.1	4,449.4	4,739.5	4,197.8	4,998.9	2,420.1	2,616.5	3,425.5	4,657.9	4,298.1
Lao PDR	4.8	3.4	2.3	3.0	1.0	4.1	-1.0	0.0	0.1	0.0	0.0
Malaysia	2,488.0	3,768.0	2,675.0	863.0	1,422.4	2,026.1	266.8	1,904.7	1,369.5	2,061.3	2,972.4
Myanmar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Philippines	98.0	182.0	136.0	160.0	133.0	125.0	-140.0	65.0	303.0	579.0	189.0
Singapore	6,787.3	7,950.9	10,903.6	2,165.0	8,002.5	5,915.4	19,964.8	2,328.7	2,694.8	8,073.8	5,034.3
Thailand	887.0	932.0	584.0	132.0	349.0	-22.0	430.0	171.0	621.0	76.0	551.8
Viet Nam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	65.0
EU	159,032.4	183,837.8	225,458.2	420,815.2	727,136.9	811,659.6	434,993.6	265,794.5	286,722.7	359,772.7	609,077.0
US	92,074.0	84,426.0	95,769.0	131,004.0	209,391.0	142,626.0	124,873.0	134,946.0	129,352.0	257,967.0	-27,736.0
World	**363,251.0**	**397,709.5**	**483,078.6**	**697,051.1**	**1,108,353.5**	**1,239,190.0**	**745,479.2**	**540,714.0**	**560,086.7**	**877,301.1**	**837,193.7**

Source: UNCTAD (2006).

Table 2.9: FDI Net Flows in East Asia, 1995–2005

(Million)

Country/ Economy	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Brunei Darussalam	539.8	553.4	698.7	588.9	735.5	529.0	517.7	1,011.3	3,299.2	330.3	253.9
Cambodia	150.7	293.7	168.1	223.0	223.1	141.9	142.1	139.1	74.3	121.2	374.9
China	35,520.5	39,611.5	42,694.6	42,828.9	38,544.4	39,799.0	39,992.2	50,224.5	50,650.4	55,132.0	60,144.8
Hong Kong	-18,786.6	-16,070.7	-13,038.7	-2,219.7	5,209.1	2,572.0	12,431.5	-7,781.1	8,132.0	-11,684.1	6,416.6
Indonesia	3,027.0	5,594.0	4,500.0	-285.0	-1,937.0	-4,700.0	-3,103.4	-36.7	-809.6	-1,512.0	5,272.0
Japan	-22,588.8	-23,198.4	-22,768.6	-20,959.5	-10,002.0	-23,234.8	-32,091.9	-23,041.3	-22,475.9	-23,135.5	-43,005.7
Korea	-2,305.3	-2,657.7	-1,808.0	332.8	5,684.9	4,003.3	1,710.2	778.5	958.0	4,322.4	2,751.4
Lao PDR	83.6	124.6	84.0	42.3	50.6	29.9	24.9	25.0	19.4	16.9	27.7
Malaysia	3,327.0	3,529.0	3,648.0	1,851.0	2,472.9	1,761.6	287.1	1,298.7	1,103.7	2,562.9	992.4
Myanmar	317.6	580.7	878.8	683.6	304.0	208.0	192.0	191.4	291.2	251.0	235.8
Philippines	1,361.0	1,338.0	1,113.0	1,592.0	1,114.0	2,115.0	335.0	1,477.0	188.0	109.0	1,665.0
Singapore	4,748.0	1,731.2	2,849.1	5,148.9	8,575.4	10,569.1	-4,343.9	4,871.3	8,969.3	11,754.5	9,969.4
Thailand	1,183.0	1,406.0	3,298.0	7,360.0	5,742.0	3,371.0	4,631.0	3,164.0	4,614.0	5,786.0	8,405.2
Viet Nam	1,780.4	1,803.0	2,587.3	1,700.0	1,483.9	1,289.0	1,300.3	1,200.1	1,450.0	1,610.1	1,956.0
EU	-27,178.4	-58,653.7	-81,336.4	-137,244.8	-222,652.9	-114,270.8	-51,442.9	43,663.8	-25,705.8	-145,557.9	-112,323.1
US	-33,302.0	34.0	7,636.7	43,434.8	74,285.4	171,371.2	34,604.6	-60,445.4	-76,211.5	-122,117.2	128,797.3
World	**-20,659.3**	**-4,966.5**	**6,164.6**	**12,251.6**	**-9,457.9**	**172,175.8**	**87,088.0**	**81,280.7**	**3,991.5**	**-135,157.7**	**108,601.6**

Note: Net FDI Flows = Net FDI Inflows – Net FDI Outflows

Source of Basic Information: UNCTAD (2006).

On the country level, Japan continued to dominate as the largest FDI investor in the region, accounting for 5.5% of total outward FDI in 2005, followed by Hong Kong with 3.2% share and China with 1.5%. Within the ASEAN, nearly 70% of FDI outflows were sourced from the more developed economies, such as Singapore and Malaysia.

3.3 Concluding Remarks

The paper reviewed the regional trend in FDI inflows to and outflows from East Asia from 1995–2005. The review revealed that although the European Union (EU) and the United States (US) has remained as the primary host of inward foreign funds and investor of FDI, the East Asia region has gained increasing importance both as a source and recipient of FDI, particularly with the rise of China as an important player in the region and the world economy, resulting to a large extent on the development of production networks in the region. This has of course started an animated debate on whether China due to its impressive inward FDI record, has actually diverted investments from the rest of the countries in the region. The paper shows that China's FDI inflows has actually just kept up with the country's GDP in recent years and that the flow of funds to China does not necessarily mean that less will be available for other countries since China has in turn become one of the principal FDI donors in the region. The more important challenge for other countries is in developing an enabling domestic environment to attract foreign capital into their respective economies.

Intra-regional investments have also gained prominence with increased propensity among members of the region to recycle funds into the regional economy. In this regard, what is needed is a facilitating environment for improved intra-regional linkages to promote a more liberal flow of capital among the various economies in the region.

Chapter 3: Portfolio Investments in East Asia

1 Introduction

Developing countries of East Asia have grown rapidly in the past decade. This growth has been led by rapid export expansion and substantial capital inflows. Most inflows started in the form of official lending, followed by bank lending with government guarantees, but more recently through private sources, often without government guarantees. Private-to-private flows now constitute most of the external capital flows, the bulk of which are in the form of foreign direct investment. However, the most substantial growth in the past few years has been in foreign portfolio investment flows. Flows of foreign portfolio investment have also contributed to the development of domestic capital market.

Since the mid-1980s, there has been a significant increase in the amount of international flows of portfolio investment, especially from countries in the North to emerging market economies across the South. Portfolio Investment entails the purchase of bonds and corporate stock without acquisition of a controlling interest by the investor. North-South portfolio investment flows have been perceived as a relatively safe, efficient means of transferring capital to those countries where it is needed most. But this view has changed with the East Asian financial crisis in 1997-98. A number of studies have argued that unregulated international flow of portfolio investment, especially in emerging market economies may have deep structural problems.

Net portfolio investment inflows into emerging market economies totaled $800 million 1987 but increased to $7.2 billion in 1991 and $45.7 billion in 1996. Two reasons were cited as to the reason why US portfolio investors were drawn to emerging economies. First, these investors faced an apparent decline in investment opportunities in the US following the 1987 stock market plunge and the concomitant reduction in US interest rates. Second, at the insistence of the US, and especially the IMF during the 1980s, many developing countries deregulated their financial systems through domestic financial liberalization programs, which precipitated a flourishing of new markets and investment instruments and eliminated controls on capital inflows and outflows (through external financial liberalization) (Grabel, 1998).

After the financial crisis in Asia in 1997, most of the emerging Asian economies have had a decade of continuous growth. Capital flows have been strong on the aggregate. Asian economies have been generating strong current account surpluses particularly with developed economies. The current account surpluses are said to have significantly reduced the degree to which Asian economies are subject to interruptions in capital flows. A number of emerging economies have been experiencing increases in financial assets both on liability and asset side. Although there were concerns with the size of net external surplus of China and other emerging economies, there has been a large increase in two-way capital flow between advanced and emerging economies. Emerging economies have particularly been accumulating large stocks of US treasury bills in the form of international reserves as well as other fixed income assets. At the same time, they were also getting large inflows of FDI and portfolio investment as well as bond market inflows (Devereux, 2008).

External savings have been a welcome addition to East Asia's high domestic savings in helping spur economic growth. However, large capital inflows confront recipient countries with new risks and challenges that require careful management to ensure that those benefits are realized. At the macro level, large external flows can affect a country's competitiveness, saving, and investment performance, exposes it to external shocks, and ultimately reduces its degree of

policy independence from the rest of the world. At the micro level, sustained capital inflows can have profound effects on the policies of the financial, industrial, and other sectors, on the shape of regulation of domestic capital markets, and even on the extent and form of government activity in the economy.

2 Pros and Cons of Portfolio Flows

In general, portfolio flows have the potential to provide stimulus for the development and growth especially of developing economies. However, if capital flows are not well managed, this can also disrupt the development process.

In general, benefits of capital flows (portfolio investment) are as follows:

a) additional resources available for productive investment
b) risk sharing with the rest of the world
c) greater external market discipline on macroeconomic policy
d) greater liquidity to meet domestic financing needs
e) broadening and deepening of national capital markets
f) improvement of financial sector skills.

On the other hand, the possible costs of capital flows (portfolio investment) are:

a) currency appreciation
b) reduced scope for independent macroeconomic policy actions
c) greater exposure to external shocks
d) disruption of national capital markets
e) increased volatility in financial and exchange markets
f) high sterilization costs.

Large capital flows have brought substantial benefits in East Asia. In particular, they have permitted higher levels of investment, facilitated the transfer of technology, enhanced management skills, and enlarged market access. Most countries have adapted policies to increase investment and related imports to mitigate pressures on exchange rates and in doing so they have been able to sustain their high growth rates. At the same time, East Asian economies have also raised their domestic savings, which has facilitated absorption of foreign capital and reduced the countries' vulnerability to variations in capital flows.

Large capital flows on the other hand, can create pressures that may lead to inflation, real appreciation of the exchange rate, lower domestic saving, and a reduction in the domestic interest rate or the cost of capital. The impact however, depends on the volume of flows, the macroeconomic policy framework, the microstructure of the flows, and the incentives in the financial sector. The more the economy can direct capital flows into increased productive investment, the less effect the flows will have on interest and exchange rates. Governments can also sterilize the flows through monetary intervention, although usually at some cost. This practice has generally proved difficult to sustain, but it can provide some leeway during which other policies can be put in place.

Therefore, a balance between monetary and fiscal policy is critical in managing capital flows. One long-run option that several countries have adopted is to mobilize greater public savings. This approach reduces domestic pressures on domestic resources and allows an easier monetary policy and lower interest rates, lessening the pull of high interest rates on short-term capital inflows. Also, most East Asian economies have not sustained deficits, which have contributed to a more favorable climate for foreign investment. An increase in public saving

influences the level of public expenditures, particularly, public investment. Governments will need to develop long-term strategies to manage capital flows, taking into account the sectoral and distributional aspects of the flows, as well as the aggregate macroeconomic effects on both monetary and fiscal policy. In recent experience, a tighter fiscal stance has proved more effective that a tight monetary policy (such as high interest rates) in managing capital flows in the medium term. This approach has also been consistent with high rates of domestic saving and investment.

Capital flows represent a variety of different instruments, maturities, and risks to the country. The substantial changes in the kinds of instruments underlying these flows have important implications for policymaking. East Asia has traditionally been a major recipient of foreign direct investment, and there have been large flows between countries within the region. However, foreign portfolio investment has surged in recent years and poses its own problems, which vary depending on whether the instrument is placed abroad or in the domestic market. If portfolio investment is placed abroad, it may act more like direct investment if the resulting inflow is used for new investment. But firms seeking financing abroad may undermine domestic monetary policy, and large inflows may disturb a country's capital markets in a number of ways. Portfolio investment that goes directly into the domestic capital market may be create more problems, as it can lead to asset inflation and thus tend to reduce domestic saving rather than to increase investment. It is also more likely to affect the exchange rate and to be volatile because it is much more liquid and more sensitive to short-run external factors such as interest rate movements. Portfolio investment therefore adds urgency to regulatory and prudential reform programs. Well functioning domestic markets make managing portfolio flows easier. In the end, portfolio flows can be disruptive and thus governments may be forced to take strong short-term action.

Grabel (1998) posit that portfolio investment has the greatest potential to destabilize the recipient economy. This is because of the liquidity of portfolio investment and the short time horizon associated with such investments. For instance, in the case of the Asian financial crisis, a reversal in conventional wisdom among investors regarding Southeast Asian prospects (initially with regard to Thailand) precipitated the sudden liquidation of portfolios and the dumping of currency holdings. This rapid exit depressed stock prices and undermined the ability of Southeast Asian governments to maintain the value of their currencies. Depreciation, in turn, exacerbated the problem of investor flight and induced a debt crisis as domestic institutions faced rapidly rising costs associated with hard currency-denominated foreign obligations. The lesson of the crisis is that while uncontrolled portfolio investment flows do not themselves cause financial crises, they render emerging economies vulnerable to a collapse that can be triggered by a large-scale exit of portfolio investment.

3 Development of Portfolio Flows in East Asia

The level of capital flows to East Asia has dramatically increased over the decade prior to the Asian Financial Crisis in 1997. Portfolio capital (including equities and bonds) have experienced sharp increase in the 1990s after being practically nonexistent in prior decades. The surge in capital flows was a reflection of the rapid expansion and integration of international capital markets that had been driven by economic policy and structural changes, and technological factors. The latter refer to revolutionary advances in handling of information and telecommunications and the emergence of increasingly sophisticated financial engineering. These factors have increased the speed and complexity of capital account transactions (Yap, 2000).

Capital flows into East Asia were biased to foreign direct investment, which favors investment and economic growth because of the accompanying transfer of technology and management skills. However, in recent years, financial and capital liberalization shifted the composition of capital inflows more towards short-term capital and portfolio investment. Liberalization and the existence of financial centers in the region (such as Thailand and Malaysia) have also facilitated the integration of financial systems and eased the inflow of short-term capital and portfolio investment.

The development of capital flows in East Asia mostly point out to the result of the liberalization of capital markets in both source and recipient countries and the increasing mixture of more complicated financial instruments.

A liberal policy on capital flows improve the allocation of capital globally by allowing resources to move to areas with higher rates of return. However, limiting capital flows in the market may lead to distortions to the economy imposing the controls. Several studies posit that potential gains can far outweigh the risks; however, the success depends on correct domestic policy and proper implementation. For instance, prudent macroeconomic policies and management is essential if capital inflows are to be effectively absorbed and efficiently allocated to complement domestic resources. As capital markets become more open, policy management becomes more complex. Because some forms of capital are highly mobile, there is now less capacity for divergence from international levels of key variables. Thus, greater weight needs to be put on achieving the right policy mix. Therefore, it is important to ensure that increased capital flows, greater capital mobility and increasing portfolio diversification in international market should produced greater benefits to outweigh the risks.

East Asian countries have followed different courses in opening their capital accounts and domestic markets to foreign participation. For instance, Indonesia has been open for over two decades but only in mid-1980s that it began to expand the range of domestic assets foreigners could own, as part of a series of reforms to move the economy away from heavy dependence on oil exports. However, persistent high interest rates led to short term capital inflows as government liberalized the financial sector. These inflows resulted in high sterilization costs, and the government had to tighten fiscal policy to dampen the economy. On the other hand, Malaysia and Thailand liberalized their capital accounts during the 1980s and attracted large amounts of investments. They were able to absorb the flows effectively without exchange rate appreciation through a combination of policies that liberalized imports and tightened fiscal policy. However, they were exposed to market pressures that have called for judicious intervention by the authorities. The Philippines meanwhile, began its liberalization of capital flows in the 1970s, but was caught with excessive debt levels in the 1980s due to its relatively unsuccessful promotion of exports and growth in the country. The Philippines was the only country in East Asia that had to go through a formal debt workout with commercial banks, which delayed its development but is now continuing its capital market liberalization program. In the case of South Korea, they have been much more cautious compared with the other neighbors as they only opened their capital account and market to foreigners after it achieved a relatively high per capita income thereby encouraging development of its domestic capital markets before opening the market to foreigners.

While East Asian economies have been opened their capital markets, the Asian financial crisis that started in 1997 proved that financial systems in East Asia tend to suffer from weak governance. Masuyama (1998) asserted the lack of discipline in resolving past financial crises and preferential lending generated a moral hazard problem. Corruption among supervisors has been serious and the lack of transparency has been evident. The underdevelopment of equity

and bonds market has prevented generating useful financial information from governments and corporation while the lack of long-term finance facilities has led to mismatches in the balance sheets of financial institutions and corporations. Poor sequencing of liberalization heightened the vulnerability of financial systems. Financial and foreign exchange liberalization was often undertaken before addressing domestic financial problems such as poor governance, bad debt, and lack of competition.

The crisis highlighted the importance of strong governance and of proper sequencing liberalization. Prudential regulation and supervision of financial institutions should be strengthened and competition should be enhanced by lowering entry barriers, at least domestically and internationally to prepare for financial and foreign exchange liberalization. The need to expand securities markets became a necessary step to overcome the inflexibility and problems in financial systems dominated by banks and to increase the supply of financial information. Bond markets are needed to mobilize domestic savings for infrastructure development without over-dependence on foreign funds; to provide vehicles for investing the growing pools of funds from mandatory saving systems; and to adjust demand and supply imbalances in individual markets.

4 Trends in Portfolio Investment in East Asia

Data on monetary flows were gathered primarily from the International Monetary Fund (IMF), which conducts the Coordinated Portfolio Investment Survey (CPIS) annually from 2001 to 2006, although it was first conducted in 1997 since this has the most comprehensive data for monetary flows. The CPIS was established to develop a survey of portfolio investment assets to be coordinated among countries. The first CPIS in 1997 involved only 29 economies. The CPIS provides an economy's stock of portfolio investment assets by country of residency of the nonresident issuer. The CPIS is a very useful instrument for monetary, economic and financial stability-related analysis, as well as for statistical production as it contributes to enhancing the quality of national and regional statistics and to reducing global asymmetries in portfolio investment data.

The information derived from CPIS on cross border holdings of portfolio investment securities (debt and equity securities) are not part of the balance of payments data categories of direct investment, reserve assets, or financial derivatives.

The CPIS defines equity securities as all instruments and records acknowledging, after the claims of all creditors have been met, claims on the residual values of enterprises. Shares, stocks, participations or similar documents (such as American depository receipts) usually denote ownership of equity.

Long term debt securities on the other hand covers bonds, debentures, and notes that usually give the holder the unconditional right to a fixed cash flow or contractually determined variable money income and have an original term to maturity of more than one year.

Short term debt securities includes treasury bills, commercial paper, and bankers' acceptances that usually give the holder the unconditional right to a stated fixed sum of money on a specified date. These instruments are usually traded on organized markets at a discount and have an original term to maturity of one year or less.

Below are the following important notes related to the data obtained from the CPIS. The data derived were from individual country reports.

Notes:

0.00 - indicates a zero value or a value less than $500,000
n/a - indicates an unavailable datum
(c) - indicates that a non-zero datum was not disclosed for reasons of confidentiality
-- - indicates no transaction with the partner country (the value is assumed zero)

4.1 Multilateral Portfolio Investment

4.1.1 Gross Inward Portfolio Investment Stock

Table 3.1 below presents an overview of the gross inward portfolio investment by major economic blocks [namely, East Asia, United States (US), European Union[13] (EU) and the rest of the world (ROW)] to East Asian economies[14] from 1997, 2001-2006. The amount of intra-regional investment (investment to East Asia) was strong in 1997 but experience contraction in 2002. However, since 2003, a substantial increase in intra-regional was recorded, with 2006 inward portfolio investment at $246.343 billion. However, although intra-regional investment has been increasing, its share to the total value of investment has not been substantial as it only accounts for less than 10%. In fact, intra-regional investment has been declining since 2001 and only improved slightly in 2006. A huge share of the investment is still coming from outside the region, particularly in US, with an average of around 32% and EU about 24%. In fact, investment from US has been increasing since 1997 and has even reached close to 36% of the total value of investment in East Asia while investment from EU has substantially increased since 2003. This indicates that East Asian region is still relies a lot on the US economy as well EU as source of portfolio investment.

Table 3.1: Geographic Distribution of Gross Inward Portfolio Investment in East Asia, 1997–2006

($ Million)

Country/Region	1997	2001	2002	2003	2004	2005	2006
East Asia	104,917.73	113,381.98	100,959.72	113,813.46	145,636.03	179,697.50	246,343.65
(share)	13.477%	12.037%	12.004%	9.347%	9.148%	8.320%	9.234%
US	209,526.72	256,266.42	275,886.69	410,988.20	514,760.04	764,146.94	954,727.71
(share)	26.914%	27.205%	32.802%	33.752%	32.333%	35.381%	35.789%
EU	200,712.61	237,717.75	199,569.72	303,292.95	400,114.51	523,510.03	626,516.15
(share)	25.782%	25.236%	23.728%	24.908%	25.132%	24.239%	23.485%
ROW	263,351.13	334,613.94	264,652.11	389,578.21	531,533.51	692,410.52	840,095.99
(share)	33.828%	35.522%	31.466%	31.994%	33.387%	32.060%	31.492%
Total Value of Investment	**778,508.19**	**941,980.09**	**841,068.24**	**1,217,672.82**	**1,592,044.09**	**2,159,764.99**	**2,667,683.50**

Table 3.2A to 3.2G presents a more detailed country analysis of gross inward portfolio investments by major economic blocks to East Asian economies from 1997, 2001-2006. In

[13] European Union in this study is defined as France, Germany, Italy, Finland, Netherlands, Portugal, Spain, United Kingdom and Sweden.

[14] East Asian economies is defined as ASEAN economies (Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam), Japan, China, South Korea and Hong Kong.

general, overall investments were healthy and especially during the latter years where most countries experienced significant increases. South Korea, Hong Kong and Singapore were the major recipients of inward portfolio investments in the region although it was worth considering that investments in China have grown substantially over the past years.

On a year-to-year analysis, portfolio investments by major economic blocks to East Asian economies were somehow mixed in 1997. For instance, investments by East Asia were significant in four economies namely Japan, Hong Kong, South Korea, Indonesia and Malaysia while investments by US were considerable in Japan, Hong Kong and South Korea with moderate investments in Singapore. Investments by EU were mainly concentrated in Japan, with moderate investments in Hong Kong. Investments by the rest of the world were significant in Japan, were it accounted to about 93% of the total valued of its investment (refer to Table 3.2A).

Table 3.2A: Country Distribution of Gross Inward Portfolio Investment by Major Economic Blocks to East Asian Economies, 1997

Recipient Country	Portfolio Assets Sent by Each Region ($ Million)				
	East Asia	US	EU	ROW	Total Value of Investment
Brunei	-	-	0.88	n/a	n/a (0.88)
Cambodia	-	1.00	-	n/a	n/a (1)
Indonesia	8,225.36	3,492.54	2,332.25	3,382.06	17,432.21
Lao PDR	-	-	-	n/a	n/a
Malaysia	8,727.35	2,325.55	4,477.41	3,466.20	18,996.51
Myanmar	-	142.00	-	n/a	n/a (142)
Philippines	1,517.52	7,271.00	2,068.34	798.74	11,655.60
Singapore	2,586.59	10,633.00	6,441.22	1,791.52	21,452.33
Thailand	-	n/a	2,360.83	n/a	n/a (2360.83)
Vietnam	6.16	37.00	52.51	n/a	n/a (95.6705)
China	4,491.73	5,394.00	3,195.90	n/a	n/a (13081.6)
Hong Kong	10,075.12	31,395.00	26,338.53	6,230.23	74,038.88
Japan	60,783.38	133,650.63	146,640.75	245,507.77	586,582.53
South Korea	8,504.52	15,185.00	6,804.00	2,174.61	32,668.13
Total	**104,917.73**	**209,526.72**	**200,712.61**	**263,351.13**	**778,508.19**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

In 2001, investments by East Asia have substantially increased to South Korea, Philippines and Singapore while decreases in investments were seen in Indonesia and Malaysia. Meanwhile, investments by US to South Korea and Singapore experienced significant increase during the year while investment by EU to Japan and Hong Kong increased. Investments by the rest of the world to Singapore, South Korea and Hong Kong also remained robust (refer to Table 3.2B).

Table 3.2B: Country Distribution of Gross Inward Portfolio Investment by Major Economic Blocks to East Asian Economies, 2001

Recipient Country	Portfolio Assets Sent by Each Region ($ Million)				
	East Asia	US	EU	ROW	Total Value of Investment
Brunei	n/a	n/a	0.00	n/a	n/a
Cambodia	n/a	n/a	n/a	n/a	n/a
Indonesia	2,540.75	1,366.42	1,183.66	2,211.46	7,302.29
Lao PDR	n/a	n/a	n/a	n/a	n/a
Malaysia	6,231.52	1,964.25	3,643.47	3,210.88	15,050.12
Myanmar	n/a	n/a	n/a	n/a	n/a
Philippines	4,193.05	4,015.21	1,745.10	2,772.41	12,725.77
Singapore	5,648.45	22,817.61	15,024.93	7,204.13	50,695.12
Thailand	4,164.63	3,133.95	2,785.24	6,857.14	16,940.96
Vietnam	n/a	21.00	35.46	n/a	n/a (56.46)
China	n/a	3,003.88	3,215.04	n/a	n/a (6218.92)
Hong Kong	11,601.78	32,047.17	36,479.76	16,561.56	96,690.27
Japan	64,833.28	153,422.43	156,438.50	291,100.05	665,794.26
South Korea	14,168.52	34,474.50	17,166.58	10,971.70	76,781.30
Total	**113,381.98**	**256,266.42**	**237,717.75**	**334,613.94**	**941,980.09**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

In 2002, contractions in total value of investments were experienced by most East Asia economies although investments to South Korea remained strong across different economic blocks. Investment to Singapore remained healthy in East Asia while Malaysia experienced the biggest drop in investments from East Asia of 44%. On the other hand, investment of US in Hong Kong fell significantly during the year as also experienced by most economies. The same was the case for investments by EU were it declined by 16%. Investments by the rest of the world to East Asia also dramatically fell by 21% during the year (refer to Table 3.2C).

Table 3.2C: Country Distribution of Gross Inward Portfolio Investment by Major Economic Blocks to East Asian Economies, 2002

Recipient Country	Portfolio Assets Sent by Each Region ($ Million)				
	East Asia	US	EU	ROW	Total Value of Investment
Brunei	n/a	0.00	0.00	n/a	n/a
Cambodia	n/a	0.00	n/a	n/a	n/a
Indonesia	1,279.58	822.10	297.41	2,528.55	4,927.64
Lao PDR	n/a	0.00	n/a	n/a	n/a
Malaysia	3,461.19	2,357.48	1,587.03	5,925.91	13,331.61
Myanmar	n/a	0.00	n/a	n/a	n/a

Philippines	3,381.80	4,555.00	549.41	2,655.90	11,142.11
Singapore	7,145.45	19,885.00	9,151.98	6,082.58	42,265.01
Thailand	n/a	n/a	2,737.67	n/a	n/a (2737.67)
Vietnam	n/a	46.99	2.87	n/a	n/a (49.86)
China	n/a	4,963.00	3,646.41	n/a	n/a (8609.41)
Hong Kong	9,217.57	23,657.00	19,008.49	17,045.73	68,928.79
Japan	58,760.06	180,027.12	143,560.69	228,068.78	610,416.65
South Korea	17,714.07	39,573.00	19,027.77	13,741.59	90,056.43
Total	**100,959.72**	**275,886.69**	**199,569.72**	**264,652.11**	**841,068.24**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

In 2003, investments to East Asia generally recovered. For instance, investments to Indonesia, Malaysia, Singapore, Hong Kong and South Korea experienced moderate increases. On the other hand, investments by US to East Asian economies dramatically increased following a contraction in the previous year. Most notable were the increases in Singapore, China, Hong Kong and South Korea. Also, investments by EU rose significantly by 52% with majority of them invested in Japan, Hong Kong and South Korea. Investments by the rest of the world to East Asia increased by 47% due to steady inflows from Singapore, Hong Kong and South Korea (refer to Table 3.2D).

Table 3.2D: Country Distribution of Gross Inward Portfolio Investment by Major Economic Blocks to East Asian Economies, 2003

Recipient Country	Portfolio Assets Sent by Each Region ($ Million)				
	East Asia	**US**	**EU**	**ROW**	**Total Value of Investment**
Brunei	n/a	n/a	0.00	n/a	n/a
Cambodia	n/a	n/a	n/a	n/a	n/a
Indonesia	2,717.00	1,960.75	2,583.91	2,716.32	9,977.98
Lao PDR	n/a	n/a	n/a	n/a	n/a
Malaysia	5,962.73	2,902.22	6,777.10	5,845.59	21,487.64
Myanmar	n/a	0.00	n/a	n/a	n/a
Philippines	3,416.28	5,046.00	4,001.74	4,277.26	16,741.28
Singapore	9,243.90	25,001.00	11,656.21	9,284.43	55,185.54
Thailand	n/a	n/a	5,878.40	n/a	n/a (5878.40)
Vietnam	n/a	81.00	73.95	n/a	n/a (154.946)
China	n/a	13,738.00	8,632.38	n/a	n/a (22370.4)
Hong Kong	14,100.89	37,661.00	29,265.82	27,054.13	108,081.84
Japan	56,789.32	271,169.23	205,493.36	333,713.84	867,165.75
South Korea	21,583.34	53,429.00	28,930.08	21,271.37	125,213.79
Total	**113,813.46**	**410,988.20**	**303,292.95**	**389,578.21**	**1,217,672.82**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

By 2004, investments by East Asia have begun to increase to almost all economies (except Philippines) with Malaysia and Indonesia experiencing a 90% increase in investments. Overall, intra-regional investments expanded by 29% during the year. US investments on the other hand, increased by 19% as Indonesia and South Korea experiencing a 50% and 38% growth in investments respectively. Also, investments by EU rose by 32% with consistent expansion in investments in Japan, Hong Kong and South Korea. Investments by the rest of the world were also robust as it increased by around 36% during the year (refer to Table 3.2E).

In 2005, investment by East Asia continued to grow with South Korea still receiving the largest investment although significant increases in investments were seen in Hong Kong (grew by 71%) and Singapore (by 20%) during the year. In the case of US, investments to all economies (except Indonesia) experienced significant increases particularly in the case of China which grew by 124% and South Korea by 61%. Investments by EU and the rest of the world also rose by 31% and 30% respectively, mainly due to the higher investments to Japan and South Korea (refer to Table 3.1F).

Table 3.2E: Country Distribution of Gross Inward Portfolio Investment by Major Economic Blocks to East Asian Economies, 2004

Recipient Country	Portfolio Assets Sent by Each Region ($ Million)				
	East Asia	**US**	**EU**	**ROW**	**Total Value of Investment**
Brunei	n/a	0.00	0.00	n/a	n/a
Cambodia	n/a	0.00	n/a	n/a	n/a
Indonesia	5,087.06	2,928.06	3,513.12	5,407.80	16,936.04
Lao PDR	n/a	0.00	n/a	n/a	n/a
Malaysia	10,936.16	4,391.91	11,486.60	6,945.80	33,760.47
Myanmar	n/a	0.00	n/a	n/a	n/a
Philippines	3,196.58	5,690.08	4,001.54	4,112.06	17,000.26
Singapore	11,240.91	29,194.59	16,320.66	11,596.28	68,352.44
Thailand	n/a	n/a	6,616.50	n/a	n/a (6616.50)
Vietnam	n/a	112.71	57.55	n/a	n/a (170.264)
China	n/a	12,722.52	10,832.27	n/a	n/a (23,554.8)
Hong Kong	18,163.38	37,350.48	41,217.38	27,009.61	123,740.85
Japan	72,106.29	348,756.21	268,864.47	463,665.80	1,153,392.77
South Korea	24,905.65	73,613.48	37,204.40	30,302.50	166,026.03
Total	**145,636.03**	**514,760.04**	**400,114.51**	**531,533.51**	**1,592,044.09**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

Table 3.2F: Country Distribution of Gross Inward Portfolio Investment by Major Economic Blocks to East Asian Economies, 2005

Recipient Country	Portfolio Assets Sent by Each Region ($ Million)				
	East Asia	US	EU	ROW	Total Value of Investment
Brunei	n/a	0.00	0.00	n/a	n/a
Cambodia	n/a	0.00	n/a	n/a	n/a
Indonesia	4,121.31	2,850.64	4,803.55	7.23	11,782.73
Lao PDR	n/a	0.00	n/a	n/a	n/a
Malaysia	10,649.67	5,224.66	11,167.37	7,619.76	34,661.46
Myanmar	n/a	0.00	n/a	n/a	n/a
Philippines	3,356.01	7,179.00	6,662.58	5,694.56	22,892.15
Singapore	13,933.97	36,361.00	18,699.56	17,392.44	86,386.97
Thailand	7,718.30	7,961.65	7,555.94	17,100.17	40,336.06
Vietnam	n/a	306.00	595.50	n/a	n/a (901.503)
China	n/a	28,443.00	15,971.50	n/a	n/a (44414.50)
Hong Kong	25,451.95	46,225.00	41,043.34	33,203.95	145,924.24
Japan	84,831.60	511,088.99	366,087.20	580,413.53	1,542,421.32
South Korea	29,634.69	118,507.00	50,923.50	47,545.87	246,611.06
Total	**179,697.50**	**764,146.94**	**523,510.03**	**692,410.52**	**2,159,764.99**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

In 2006, major economic blocks' investments to most economies have grown significantly. Overall, East Asian investment grew by 56%. Most notable were the growth in Indonesia (grew by 332%), Hong Kong (60%), Malaysia (50%) and South Korea (41%). Also, US investments grew by 50% during the year and had remarkable increases in investments particularly in Indonesia (213%), China (165%) and Malaysia (113%) which contributed significantly to the increase in portfolio investments. Investments by EU meanwhile increased by 20% as inflow to Japan remained robust. Investments by the rest of the world also grew by 21% during the year (refer to Table 3.2G).

Table 3.2G: Country Distribution of Gross Inward Portfolio Investment by Major Economic Blocks to East Asian Economies, 2006

Recipient Country	Portfolio Assets Sent by Each Region ($ Million)				
	East Asia	US	EU	ROW	Total Value of Investment
Brunei	n/a	n/a	0.00	n/a	n/a
Cambodia	n/a	n/a	n/a	n/a	n/a
Indonesia	17,818.36	8,922.15	7,510.32	18,150.32	52,401.15
Lao PDR	n/a	n/a	n/a	n/a	n/a
Malaysia	15,953.00	11,131.81	14,661.79	18,101.91	59,848.51

Myanmar	n/a	n/a	n/a	n/a	n/a
Philippines	3,588.48	10,989.00	8,743.05	6,929.61	30,250.14
Singapore	19,975.89	52,731.00	28,061.82	25,316.06	126,084.77
Thailand	8,372.00	9,672.00	8,379.32	20,032.68	46,456.00
Vietnam	n/a	238.00	619.54	n/a	n/a (857.535)
China	n/a	75,314.00	30,205.36	n/a	n/a (105519.00)
Hong Kong	40,631.23	87,518.00	52,785.91	52,741.48	233,676.62
Japan	98,128.57	574,336.75	419,084.67	671,339.50	1,762,889.49
South Korea	41,876.12	123,875.00	56,464.38	58,309.32	280,524.82
Total	**246,343.65**	**954,727.71**	**626,516.15**	**840,095.99**	**2,667,683.50**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

4.1.2 Gross Inward Portfolio Flows

Table 3.3 presents a comparison of the gross inward portfolio flows to East Asia by major economic blocks (namely East Asia, US, EU and the rest of the world). As shown, total value of investment has grown rapidly since the region experienced contraction in 2002 although there was a reduction in the total value of investments in 2006. Intra-regional investment in East Asia has been growing at a moderate pace since 2003, with investments reaching $66.65 billion in 2006. However, comparing it with the share of US and the rest of the world, intra-regional investment is still very small. In fact, from the period 1997, 2001-2006, it only contributed to an average of about 8% of the total value of investments in the region. On the other hand, US contribution reached an average of 34% during the last four years. Investments by EU were healthy although it has been decreasing since 2003 in terms of its total share in investments. Also, investment by the rest of the world has been increasing in terms of flow although it has decreased in terms of share in 2005 and 2006.

Table 3.3: Geographic Distribution of Gross Inward Portfolio Flows to East Asia, 2001–2006

($ Million)

Country/Region	2001	2002	2003	2004	2005	2006
East Asia	**12,962.14**	**(8,257.62)**	**12,853.74**	**31,823.50**	**34,058.08**	**66,646.15**
(share)	7.235%	9.834%	3.543%	8.478%	6.172%	14.453%
US	**46,882.69**	**22,754.24**	**135,101.50**	**103,771.82**	**249,386.93**	**190,580.77**
(share)	26.169%	-27.098%	37.240%	27.646%	45.195%	41.330%
EU	**37,005.13**	**-38,148.03**	**103,723.24**	**96,821.56**	**123,395.52**	**103,006.12**
(share)	20.655%	45.430%	28.591%	25.795%	22.362%	22.338%
ROW	**82,303.94**	**-60,319.48**	**111,107.11**	**142,938.16**	**144,966.61**	**100,882.43**
(share)	45.940%	71.834%	30.626%	38.081%	26.271%	21.878%
Total Value of Investment	**179,153.90**	**(83,970.90)**	**362,785.59**	**375,355.04**	**551,807.14**	**461,115.47**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

On a year-to-year analysis, gross inward portfolio flows by major economic blocks to East Asia economies were healthy although volatile in some years. The robust growth in the region was particularly due to strong inflows to Japan, Singapore, Hong Kong and South Korea.

Inward portfolio flows have started to increase from 1997 to 2001 for most economies. In particular, investments to East Asian economies were relatively strong across the region except in Indonesia and Malaysia, where it experienced outflows. Portfolio flows from US and EU were also healthy as it jointly accounted for 47% of the total value of investments to East Asian economies (refer to table 3.4A).

In 2002, overall investment declined during the year as most were affected by the slowdown in the US economy as it shrank by 147%. Intra-regional investment declined by 164%, while inflows from US fell by 51%. Portfolio flows from EU also experienced significant reduction of 203%. The same trend was also experienced from investments from the rest of the world as it decreased by 183% (refer to Table 3.4B).

Table 3.4A: Country Distribution of Gross Inward Portfolio Flows by Major Economic Blocks to East Asian Economies, 2001

($ Million)

Recipient Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	n/a	0	n/a	n/a	n/a
Cambodia	n/a	n/a	n/a	n/a	n/a
Indonesia	-5,684.61	-2,126.12	-1,148.59	-1,170.60	-10,129.92
Lao PDR	n/a	0	n/a	n/a	n/a
Malaysia	-2,495.83	-361.3	-833.94	-255.32	-3,946.39
Myanmar	n/a	n/a	n/a	n/a	n/a
Philippines	2,675.54	-3,255.79	-323.23	1,973.65	1,070.17
Singapore	3,061.86	12,184.61	8,583.72	5,412.60	29,242.79
Thailand	4,164.63	3,133.95	424.42	9,217.96	16,940.96
Vietnam	n/a	-16	-17.05	n/a	n/a (-16)
China	n/a	-2,390.12	19.14	n/a	n/a (-2,390.12)
Hong Kong	1,526.66	652.17	10,141.23	10,331.34	22,651.40
Japan	4049.905	19,771.79	9,797.75	45,592.29	79,211.73
South Korea	5,664.00	19,289.50	10,362.58	8,797.09	44,113.17
Total	**12,962.14**	**46,882.69**	**37,005.13**	**82,303.94**	**179,153.90**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

Table 3.4B: Country Distribution of Gross Inward Portfolio Flows by Major Economic Blocks to East Asian Economies, 2002

($ Million)

Recipient Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	n/a	0	n/a	n/a	n/a
Cambodia	n/a	0	n/a	n/a	n/a
Indonesia	-1,261.17	-544.32	-886.25	317.09	-2,374.65
Lao PDR	n/a	0	n/a	n/a	n/a
Malaysia	-2,770.33	393.23	-2,056.44	2,715.03	-1,718.51
Myanmar	n/a	0	n/a	n/a	n/a
Philippines	-811.25	539.79	-1,195.70	-116.50	-1,583.66
Singapore	1,497.00	-2,932.61	-5,872.95	-1,121.54	-8,430.10
Thailand	n/a	n/a	-47.58	n/a	n/a
Vietnam	n/a	25.99	-32.59	n/a	n/a
China	n/a	1,959.12	431.38	n/a	n/a
Hong Kong	-2,384.20	-8,390.17	-17,471.27	484.16	-27,761.48
Japan	-6,073.22	26,604.70	-12,877.81	-63,031.28	-55,377.61
South Korea	3,545.55	5,098.50	1,861.19	2,769.89	13,275.13
Total	**-8,257.62**	**22,754.24**	**-38,148.03**	**-60,319.48**	**-83,970.89**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

In 2003, inward portfolio investment flows to East Asia recovered following a contraction in 2002. Intra-regional investment increased by 256% as investments to Hong Kong, Singapore and Malaysia rose significantly. Investments by US also improved particularly in Singapore, Japan, Hong Kong and South Korea. Investment flows from EU recovered by 372% mainly due to strong flows to Japan, Hong Kong and South Korea. Also, overall value of investments significantly increased by 284% (refer to Table 3.4C).

Table 3.4C: Country Distribution of Gross Inward Portfolio Flows by Major Economic Blocks to East Asian Economies, 2003

($ Million)

Recipient Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	n/a	n/a	n/a	n/a	n/a
Cambodia	n/a	n/a	n/a	n/a	n/a
Indonesia	1,437.42	1,138.65	2,286.50	187.77	5,050.34
Lao PDR	n/a	0	n/a	n/a	n/a
Malaysia	2,501.55	544.73	5,190.07	-80.32	8,156.03
Myanmar	n/a	0	n/a	n/a	n/a
Philippines	34.48	491	3,452.33	1,621.36	5,599.17

Singapore	2,098.45	5,116.00	2,504.23	3,201.85	12,920.53
Thailand	n/a	n/a	3,140.74	n/a	n/a
Vietnam	n/a	34.01	71.08	n/a	n/a
China	n/a	8,775.00	4,985.97	n/a	n/a
Hong Kong	4,883.32	14,004.00	10,257.33	10,008.41	39,153.06
Japan	-1,970.74	91,142.11	61,932.67	105,645.06	256,749.10
South Korea	3,869.27	13,856.00	9,902.31	7,529.78	35,157.36
Total	**12,853.74**	**135,101.50**	**103,723.24**	**111,107.11**	**362,785.59**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

In 2004, the total value of investments continued to rise as it reached $375.3 billion. Intra-regional investments grew rapidly during the year as it increased by 148%. Large Investment flows to Japan and Malaysia contributed to the strong portfolio flows in the region. On the other hand, investments by US fell during the year by 23% as cut down in investments were experienced by Hong Kong, Japan and South Korea. Investments by EU also fell slightly by 7% while investments by the rest of the world expanded by 29% as investments to Japan contributed to the expansion (refer to Table 3.4D).

Table 3.4D: Country Distribution of Gross Inward Portfolio Flows by Major Economic Blocks to East Asian Economies, 2004

($ Million)

Recipient Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	n/a	0	n/a	n/a	n/a
Cambodia	n/a	0	n/a	n/a	n/a
Indonesia	2,370.05	967.31	929.22	2,691.48	6,958.06
Lao PDR	n/a	0	n/a	n/a	n/a
Malaysia	4,973.43	1,489.69	4,709.50	1,100.21	12,272.83
Myanmar	n/a	0	n/a	n/a	n/a
Philippines	-219.7	644.08	-0.20	-165.20	258.98
Singapore	1,997.01	4,193.59	4,664.45	2,311.84	13,166.89
Thailand	n/a	n/a	738.10	n/a	n/a
Vietnam	n/a	31.71	-16.39	n/a	n/a
China	n/a	-1,015.48	2,199.89	n/a	n/a
Hong Kong	4,062.49	-310.52	11,951.56	-44.52	15,659.01
Japan	15,317.90	77,586.98	63,371.11	129,951.04	286,227.03
South Korea	3,322.31	20,184.48	8,274.32	9,031.13	40,812.24
Total	**31,823.50**	**103,771.82**	**96,821.56**	**142,938.16**	**375,355.04**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

In 2005, total value of investments was boosted as investments from major blocks (US, EU and the rest of the world) significantly increased. US investment to the region expanded by about 140% as investments to Japan and South Korea, which increased by 109% and 122% respectively. Investments to Japan and South Korea by EU, which rose by 27% also contributed to the expansion (refer to Table 3.4E).

Table 3.4E: Country Distribution of Gross Inward Portfolio Flows by Major Economic Blocks to East Asian Economies, 2005

($ Million)

Recipient Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	n/a	0	n/a	n/a	n/a
Cambodia	n/a	0	n/a	n/a	n/a
Indonesia	-965.75	-77.42	1,290.43	-5,400.57	-5,153.31
Lao PDR	n/a	0	n/a	n/a	n/a
Malaysia	-286.49	832.76	-319.24	673.96	900.99
Myanmar	n/a	0	n/a	n/a	n/a
Philippines	159.43	1,488.92	2,661.03	1,582.51	5,891.89
Singapore	2,693.06	7,166.41	2,378.90	5,796.16	18,034.53
Thailand	7,718.30	7,961.65	939.44	23,716.67	40,336.06
Vietnam	n/a	193.29	537.95	n/a	n/a
China	n/a	15,720.48	5,139.23	n/a	n/a
Hong Kong	7,288.57	8,874.52	-174.04	6,194.34	22,183.39
Japan	12,721.92	162,332.78	97,222.73	116,751.12	389,028.55
South Korea	4,729.04	44,893.52	13,719.09	17,243.39	80,585.04
Total	**34,058.08**	**249,386.93**	**123,395.52**	**144,966.61**	**551,807.14**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

In 2006, value of investments decreased by 16% due to contraction in investments from US, EU and the rest of the world. However, intra-regional investments during the year rose by 96% as inflows to Hong Kong and South Korea contributed significantly to the rise in investment (refer to Table 3.4F).

Table 3.4F: Country Distribution of Gross Inward Portfolio Flows by Major Economic Blocks to East Asian Economies, 2006

($ Million)

Recipient Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	n/a	0	n/a	n/a	n/a
Cambodia	n/a	0	n/a	n/a	n/a
Indonesia	13,697.06	6,071.51	2,706.77	18,143.07	40,618.41
Lao PDR	n/a	0	n/a	n/a	n/a
Malaysia	5,303.33	5,907.15	3,494.42	10,482.15	25,187.05
Myanmar	n/a	0	n/a	n/a	n/a
Philippines	232.46	3,810.00	2,080.48	1,235.04	7,357.98
Singapore	6,041.92	16,370.00	9,362.26	7,923.62	39,697.80
Thailand	653.7	1,710.35	823.38	2,932.51	6,119.94
Vietnam	n/a	-68	24.03	n/a	n/a
China	n/a	46,871.00	14,233.86	n/a	n/a
Hong Kong	15,179.28	41,293.00	11,742.58	19,537.52	87,752.38
Japan	13,296.98	63,247.76	52,997.47	90,925.95	220,468.16
South Korea	12,241.43	5,368.00	5,540.88	10,763.44	33,913.75
Total	**66,646.15**	**190,580.77**	**103,006.12**	**100,882.43**	**461,115.47**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

4.1.3 Gross Outward Portfolio Flows

Table 3.5 presents a geographic distribution of investment by East Asian economies to major economic blocks (East Asia, US, EU and the rest of the world). As shown in the table, investment by East Asian economies were very volatile as total value of investment experienced significant fluctuations from 2001-2006. Intra-regional investment averaged only about 10.6% while investments received by US accounted for about 23.6%, EU 21% and investments to the rest of the world received around 44.2%. This indicates that the East Asia as a region still does not get a huge share in the investment as most of the economies invest outside the region, particularly in US and EU, still getting the bulk of the share.

Table 3.5: Geographic Distribution of Gross Outward Portfolio Flows in East Asia, 2001–2006

($ Million)

Country/Region	2001	2002	2003	2004	2005	2006
East Asia	**40,635.87**	**(3,827.92)**	**36,236.19**	**35,613.60**	**43,174.76**	**96,883.91**
(share)	6.079%	-2.336%	7.963%	8.997%	23.286%	20.600%
US	**211,336.11**	**13,093.63**	**139,380.89**	**95,534.94**	**62,547.45**	**69,981.40**
(share)	31.616%	7.990%	30.630%	24.135%	33.734%	14.880%
EU	**183,112.35**	**33,658.36**	**134,301.64**	**109,501.28**	**1,576.01**	**100,000.10**
(share)	27.394%	20.539%	29.514%	27.663%	0.850%	21.262%

ROW	**233,361.18**	**120,951.53**	**145,121.31**	**155,183.84**	**78,113.19**	**203,447.59**
(share)	34.911%	73.807%	31.892%	39.204%	42.130%	43.258%
Total Value of Investment	**668,445.51**	**163,875.60**	**455,040.03**	**395,833.66**	**185,411.41**	**470,313.00**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

On a year-to-year analysis, gross outward portfolio flows by East Asian economies to major economic blocks were volatile during the said period. The major investors in the region were the developed economies namely, Singapore, Japan, South Korea and Hong Kong, which contributed substantial amount of investments.

In 2001, intra-regional gross outward portfolio flows were generally healthy although intra-regional portfolio flows were still small relative to the share of the other economic blocks. Singapore and Hong Kong were the only economies that had significant investments to East Asia. On the other hand, investments to US were strong particularly from Japan, Hong Kong and Singapore. Japan and Hong Kong also sent huge investments to EU (refer to Table 3.6A).

In 2002, portfolio flows by East Asian economies as a whole weakened as total value of investments declined by about 75%. East Asian region experienced negative outward portfolio flows of 109% while investments to US and EU contracted by 94% and 48% respectively. Lower investments particularly by Japan, Singapore and Hong Kong contributed to the overall weakening of outflows in East Asia (refer to Table 3.6B).

Table 3.6A: Country Distribution of Gross Outward Portfolio Flows by Major Economic Blocks to East Asian Economies, 2001

($ Million)

Source Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	n/a	n/a	n/a	n/a	n/a
Cambodia	n/a	n/a	n/a	n/a	n/a
Indonesia	-67.37	193.4	75.76	-608.81	-407.02
Lao PDR	n/a	n/a	n/a	n/a	n/a
Malaysia	-98.04	56.56	151.46	381.50	491.48
Myanmar	n/a	n/a	n/a	n/a	n/a
Philippines	111.43	1,844.21	n/a	n/a	2,134.97
Singapore	20,890.70	13,302.12	25,537.44	22,723.54	82,453.80
Thailand	175.66	215.55	78.93	80.08	550.22
Vietnam	n/a	n/a	n/a	n/a	n/a
China	n/a	n/a	n/a	n/a	n/a
Hong Kong	30,256.00	39,253.00	n/a	n/a	205,600.00
Japan	-7,993.84	154,762.66	115,408.81	120,914.62	383,092.25
South Korea	-2,638.67	1,708.61	-142.97	-4,397.16	-5,470.19
Total	**40,635.87**	**211,336.11**	**183,112.35**	**233,361.18**	**668,445.51**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

Table 3.6B: Country Distribution of Gross Outward Portfolio Flows by Major Economic Blocks to East Asian Economies, 2002

($ Million)

Source Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	223.43	n/a	n/a	n/a	n/a
Cambodia	n/a	n/a	n/a	n/a	n/a
Indonesia	-51.51	30.74	101.37	137.70	218.3
Lao PDR	n/a	n/a	n/a	n/a	n/a
Malaysia	-16.92	137.67	-302.89	436.90	254.76
Myanmar	n/a	n/a	n/a	n/a	n/a
Philippines	79.61	461.74	168.68	-9.34	700.69
Singapore	-5,617.56	2,904.93	10,625.63	7,223.29	15,136.29
Thailand	-186	1,010.00	10.00	40.00	874
Vietnam	-42.85	n/a	n/a	n/a	n/a
China	695.26	n/a	n/a	n/a	n/a
Hong Kong	2,815.00	-2,233.00	18,167.00	19,719.00	38,468.00
Japan	-1,356.36	8,848.21	4,337.24	92,936.55	104,765.64
South Korea	-146.59	1,933.34	551.32	1,119.85	3,457.92
Total	**-3,827.92**	**13,093.63**	**33,658.36**	**120,951.53**	**163,875.60**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

In 2003, investments by East Asian economies significantly improved as value of investment reached $455 billion. Intra-regional investments recovery was almost similar to 2001 where investment flows reached $36.2 billion. Investments to US and EU experienced significant increases during the year as in improved by 964% and 300% respectively. Investments by Japan contributed considerably to the sharp rise in total value of investments as it increased by 212% during the year. Overall investments by Hong Kong and Singapore also contributed to the sharp rise in investments (refer to Table 3.6C).

Table 3.6C: Country Distribution of Gross Outward Portfolio Flows by Major Economic Blocks to East Asian Economies, 2003

($ Million)

Source Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	126.58	n/a	n/a	n/a	n/a
Cambodia	n/a	n/a	n/a	n/a	n/a
Indonesia	103.01	170.5	-33.02	634.50	874.99
Lao PDR	n/a	n/a	n/a	n/a	n/a
Malaysia	-34.65	55.67	226.16	-916.41	-669.23
Myanmar	n/a	n/a	n/a	n/a	n/a
Philippines	65.18	229.2	355.02	195.60	845
Singapore	11,475.04	5,494.81	5,337.51	7,058.12	29,365.48
Thailand	141.24	356.75	493.09	143.90	1,134.98

Vietnam	-82.47	n/a	n/a	n/a	n/a
China	971.24	n/a	n/a	n/a	n/a
Hong Kong	21,629.00	9,650.00	20,387.00	39,178.00	90,844.00
Japan	2,184.70	121,159.86	106,350.98	97,099.07	326,794.61
South Korea	-216.1	2,264.10	1,184.90	2,617.30	5,850.20
Total	**36,236.19**	**139,380.89**	**134,301.64**	**145,121.31**	**455,040.03**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

In 2004, total values of investments were affected by the reduction in investments to US (as it fell by 31%) and EU (fell by 18%) as investments by Japan significantly fell. On the other hand, investments to East Asia also fell marginally during the period particularly due to lower investments by Hong Kong (refer to Table 3.6D).

Table 3.6D: Country Distribution of Outward Portfolio Flows by Major Economic Blocks to East Asian Economies, 2004

($ Million)

Recipient Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	93.34	n/a	n/a	n/a	n/a
Cambodia	n/a	n/a	n/a	n/a	n/a
Indonesia	-70.98	-240.85	126.81	-243.42	-428.44
Lao PDR	n/a	n/a	n/a	n/a	n/a
Malaysia	50.9	76.87	760.77	494.69	1,383.23
Myanmar	n/a	n/a	n/a	n/a	n/a
Philippines	-62.49	676.81	584.84	36.17	1,235.33
Singapore	15,004.76	4,300.33	4,532.16	5,680.68	29,517.93
Thailand	145.86	-1,202.23	-231.65	79.03	-1,208.99
Vietnam	n/a	n/a	n/a	n/a	n/a
China	4,521.93	n/a	n/a	n/a	n/a
Hong Kong	9,388.00	12,978.00	17,386.00	26,199.00	65,951.00
Japan	5,943.82	74,174.01	84,408.34	123,831.93	288,358.10
South Korea	691.8	4,772.00	1,934.00	3,627.70	11,025.50
Total	**35,613.60**	**95,534.94**	**109,501.28**	**155,183.84**	**395,833.66**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

In 2005, intra-regional investments increased by 21% mainly due to the rise in investments by Hong Kong. On the other hand, investments to US continued to fall by 35% due to lower investments by Japan and Hong Kong. Investment to EU drastically fell during the year as it declined by 98%, again due to negative performance by Japan. Investments to the rest of the world also declined by 50%. This affected the total value of investments as if fell by 53% (refer to table 3.6E).

Table 3.6E: Country Distribution of Outward Portfolio Flows by Major Economic Blocks to East Asian Economies, 2005
($ Million)

Source Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	-8.71	n/a	n/a	n/a	n/a
Cambodia	n/a	n/a	n/a	n/a	n/a
Indonesia	208.18	-97.19	-12.29	-311.89	-213.19
Lao PDR	n/a	n/a	n/a	n/a	n/a
Malaysia	376.32	87.97	-150.02	218.53	532.8
Myanmar	n/a	n/a	n/a	n/a	n/a
Philippines	962.92	-499.07	2.91	453.02	919.78
Singapore	14,749.04	4,088.36	1,634.02	5,969.97	26,441.39
Thailand	461.72	159.59	21.78	867.52	1,510.61
Vietnam	3.39	n/a	n/a	n/a	n/a
China	2,949.56	n/a	n/a	n/a	n/a
Hong Kong	21,282.35	-1,492.16	5,620.11	10,297.12	35,707.42
Japan	996.68	53,365.05	-7,263.20	58,117.47	105,216.00
South Korea	1,184.60	6,934.90	1,722.70	5,454.40	15,296.60
Total	**43,174.76**	**62,547.45**	**1,576.01**	**78,113.19**	**185,411.41**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

In 2006, total value of investments recovered as it increased by 153%. In particular, intra-regional investment improved by 124% due to higher investments by China, Hong Kong, Japan, South Korea and South Korea. Investments to EU followed similar pattern as it rose from $1.5 billion to $100 billion. Also, investments to the rest of the world were boosted by increase investments by Japan, Hong Kong, Singapore and South Korea. On the other hand, investments to US increased marginally by 11% (refer to Table 3.6F).

Table 3.6F: Country Distribution of Outward Portfolio Flows by Major Economic Blocks to East Asian Economies, 2006
($ Million)

Source Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	-155.33	n/a	n/a	n/a	n/a
Cambodia	n/a	n/a	n/a	n/a	n/a
Indonesia	-35.99	-3.39	56.25	321.74	338.61
Lao PDR	n/a	n/a	n/a	n/a	n/a
Malaysia	1,643.87	256.65	545.00	961.08	3,406.60
Myanmar	n/a	n/a	n/a	n/a	n/a
Philippines	174.33	377.95	323.62	444.10	1,320.00
Singapore	11,343.51	2,288.41	5,852.79	19,392.67	38,877.38
Thailand	179.95	-251.66	411.86	1,668.25	2,008.40

Vietnam	3.34	n/a	n/a	n/a	n/a
China	8,687.92	n/a	n/a	n/a	n/a
Hong Kong	69,095.28	6,711.47	8,042.54	72,062.82	155,912.11
Japan	15,056.33	49,860.78	80,453.02	83,223.82	228,593.95
South Korea	9,187.66	10,741.19	4,315.03	15,612.07	39,855.95
Total	**96,883.91**	**69,981.40**	**100,000.10**	**203,447.59**	**470,313.00**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

4.1.4 Net Portfolio Investment Flows

Table 3.7 represents a summary of the geographic distribution of net portfolio flows in East Asia to major economic blocks. As shown in the total value of investments, East Asian region as a whole were net investors from 2001-2004 and 2006. However, net portfolio flows have dramatically declined from 2001-2004. In 2005, the region became a net saver with total value of investments at $366.39 billion. However, in 2006, East Asian net portfolio flows reverted again to being a net investor.

Table 3.7: Geographic Distribution of Net Portfolio Flows in East Asia, 2001–2006

($ Million)

Country/Region	2001	2002	2003	2004	2005	2006
East Asia	**(27,673.73)**	**(4,429.70)**	**(23,382.45)**	**(3,790.10)**	**(9,116.68)**	**(30,237.76)**
(share)	5.66%	1.79%	25.35%	18.51%	-2.49%	328.76%
US	**(164,453.42)**	**9,660.61**	**(4,279.39)**	**8,236.88**	**186,839.48**	**120,599.37**
(share)	33.61%	-3.90%	4.64%	-40.22%	50.99%	-1311.21%
EU	**(146,107.22)**	**(71,806.39)**	**(30,578.40)**	**(12,679.72)**	**121,819.51**	**3,006.02**
(share)	29.86%	28.97%	33.15%	61.92%	33.25%	-32.68%
ROW	**(151,057.24)**	**(181,271.01)**	**(34,014.20)**	**(12,245.68)**	**66,853.42**	**(102,565.16)**
(share)	30.87%	73.14%	36.87%	59.80%	18.25%	1115.14%
Total Value of Investment	**(489,291.61)**	**(247,846.49)**	**(92,254.44)**	**(20,478.62)**	**366,395.73**	**(9,197.53)**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

On a year-to-year analysis, portfolio outflows exceeded inflows across all economic blocks. Net outflows to US and EU accounted for 34% and 30% respectively of the total value of investments for the year. Japan and Hong Kong registered the biggest share of net outflows to US, while Japan and Singapore had the highest share in EU. On the other hand, East Asia accounted for only 5.6% of the total value of investments, with Singapore and Hong Kong as the biggest net investors in the region.

Table 3.7A: Country Distribution of Net Portfolio Investment Flows by Major Economic Blocks to East Asian Economies, 2001

($ Million)

Source Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	n/a	0	n/a	n/a	n/a
Cambodia	n/a	n/a	n/a	n/a	n/a
Indonesia	(5,617.24)	(2,319.52)	(1,224.35)	(561.79)	(9,722.90)
Lao PDR	n/a	0	n/a	n/a	n/a
Malaysia	(2,397.79)	(417.86)	(985.40)	(636.82)	(4,437.87)
Myanmar	n/a	n/a	n/a	n/a	n/a
Philippines	2,564.11	(5,100.00)	-323.23	1,973.65	(1,064.80)
Singapore	(17,828.84)	(1,117.51)	(16,953.72)	(17,310.94)	(53,211.01)
Thailand	3,988.97	2,918.40	345.49	9,137.88	16,390.74
Vietnam	n/a	-16	-17.05	n/a	n/a (-16)
China	n/a	-2,390.12	19.14	n/a	n/a (-2,409.26)
Hong Kong	(28,729.34)	(38,600.83)	10,141.23	10,331.34	(182,948.60)
Japan	12,043.75	(134,990.87)	(105,611.06)	(75,322.33)	(303,880.52)
South Korea	8,302.67	17,580.89	10,505.55	13,194.25	49,583.36
Total	**(27,673.73)**	**(164,453.42)**	**(146,107.22)**	**(151,057.24)**	**(489,291.61)**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

In 2002, total value of investment outflows declined by 49% as net outflows to East Asia and EU contributed to the reduction. Investments to US registered a net inflow primarily due to Japan's higher portfolio inflow to US.

Table 3.7B: Country Distribution of Net Portfolio Investment Flows by Major Economic Blocks to East Asian Economies, 2002

Source Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	223.43	0	n/a	n/a	n/a
Cambodia	n/a	0	n/a	n/a	n/a
Indonesia	(1,209.66)	(575.06)	(987.62)	179.39	(2,592.95)
Lao PDR	n/a	0	n/a	n/a	n/a
Malaysia	(2,753.41)	255.56	(1,753.55)	2,278.13	(1,973.27)
Myanmar	n/a	0	n/a	n/a	n/a
Philippines	(890.86)	78.05	(1,364.38)	(107.16)	(2,284.35)
Singapore	7,114.56	(5,837.54)	(16,498.58)	(8,344.83)	(23,566.39)
Thailand	(186.00)	1,010.00	(57.58)	40	874
Vietnam	-42.85	25.99	-32.59	n/a	n/a
China	695.26	1,959.12	431.38	n/a	n/a

Hong Kong	(5,199.20)	(6,157.17)	(35,638.27)	(19,234.84)	(66,229.48)
Japan	(4,716.86)	17,756.49	(17,215.05)	(155,967.83)	(160,143.25)
South Korea	3,692.14	3,165.16	1,309.87	1,650.04	9,817.21
Total	**(4,429.70)**	**9,660.61**	**(71,806.39)**	**(181,271.01)**	**(247,846.49)**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

In 2003, total value of investments outflow continued to decline as it fell by 63%. Portfolio outflows exceeded inflows across all economic blocks with EU and East Asia getting the biggest share. Significant decrease in outflows were evident in Japan, Hong Kong and Singapore.

Table 3.7C: Country Distribution of Net Portfolio Investment Flows by Major Economic Blocks to East Asian Economies, 2003

($ Million)

Source Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	n/a	-	n/a	n/a	n/a
Cambodia	n/a	-	n/a	n/a	n/a
Indonesia	1,334.41	968.15	2,319.52	(446.73)	4,175.35
Lao PDR	n/a	-	n/a	n/a	n/a
Malaysia	2,536.20	489.06	4,963.91	836.09	8,825.26
Myanmar	n/a	-	n/a	n/a	n/a
Philippines	(30.69)	261.80	3,097.31	1,425.75	4,754.17
Singapore	(9,376.59)	(378.81)	(2,833.28)	(3,856.27)	(16,444.95)
Thailand	141.24	356.75	2,647.65	143.90	1,134.98
Vietnam	(82.47)	34.01	71.08	n/a	n/a
China	971.24	8,775.00	4,985.97	n/a	n/a
Hong Kong	(16,745.68)	4,354.00	(10,129.67)	(29,169.59)	(51,690.94)
Japan	(4,155.45)	(30,017.75)	(44,418.31)	8,546.00	(70,045.51)
South Korea	4,003.07	11,591.90	8,717.41	4,994.78	29,307.16
Total	**(23,382.45)**	**(4,279.39)**	**(30,578.40)**	**(34,014.20)**	**(92,254.44)**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

In 2004, net portfolio outflows continued to fall as total value of investments further decreased by 78%. Net portfolio outflows in East Asia and EU fell by 84% and 59% respectively. Investments from US were generally stronger during the year as East Asian economies registered higher inflows of $8.2 billion.

Table 3.7D: Country Distribution of Net Portfolio Investment Flows by Major Economic Blocks to East Asian Economies, 2004

($ Million)

Source Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	93.34	-	n/a	n/a	n/a
Cambodia	n/a	-	n/a	n/a	n/a
Indonesia	2,441.03	1,208.16	802.41	2,934.90	7,386.50
Lao PDR	n/a	-	n/a	n/a	n/a
Malaysia	4,922.53	1,412.82	3,948.73	605.52	10,889.60
Myanmar	n/a	-	n/a	n/a	n/a
Philippines	(157.21)	(32.73)	(585.04)	(201.37)	(976.35)
Singapore	(13,007.75)	(106.75)	132.29	(3,368.83)	(16,351.04)
Thailand	145.86	(1,202.23)	969.75	79.03	(1,208.99)
Vietnam	n/a	31.71	(16.39)	n/a	n/a
China	n/a	(1,015.48)	2,199.89	n/a	n/a
Hong Kong	(5,325.51)	(13,288.52)	(5,434.44)	(26,243.52)	(50,291.99)
Japan	9,379.99	3,412.97	(21,037.24)	6,113.21	(2,131.07)
South Korea	2,630.51	15,412.48	6,340.32	5,403.43	29,786.74
Total	**(3,790.10)**	**8,236.88**	**(12,679.72)**	**(12,245.68)**	**(20,478.62)**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

In 2005, a reversal in trend was experienced as net portfolio inflows in East Asia registered $366 billion. Investments by US and EU and the rest of the world were generally stronger during the year. It is worthwhile to note that investments by US to China have grown considerably during the year. However, intra-regional net portfolio flows registered a net outflow mainly due to higher investments by Hong Kong to the region.

Table 3.7E: Country Distribution of Net Portfolio Investment Flows by Major Economic Blocks to East Asian Economies, 2005

($ Million)

Source Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	(8.71)	-	n/a	n/a	n/a
Cambodia	n/a	-	n/a	n/a	n/a
Indonesia	(1,173.93)	19.77	1,302.72	(5,088.68)	(4,940.12)
Lao PDR	n/a	-	n/a	n/a	n/a
Malaysia	(638.32)	744.79	(169.21)	430.93	368.19
Myanmar	n/a	-	n/a	n/a	n/a
Philippines	(803.49)	1,988.00	2,658.12	1,129.49	4,972.12
Singapore	(12,055.98)	3,078.05	744.89	(173.82)	(8,406.86)
Thailand	6,900.47	7,345.54	917.66	22,036.79	37,200.46

Vietnam	3.39	193.29	537.95	n/a	n/a
China	2,949.56	15,720.48	5,139.23	n/a	n/a
Hong Kong	(13,993.78)	10,366.69	(5,794.15)	(4,102.80)	(13,524.04)
Japan	11,695.36	108,967.73	104,485.93	58,663.53	283,812.55
South Korea	3,544.44	37,958.62	11,996.39	11,788.99	65,288.44
Total	**(9,116.68)**	**186,839.48**	**121,819.51**	**66,853.42**	**366,395.73**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

In 2006, net portfolio flows reverted to negative as outflows exceeded inflows. Investment inflows from US and EU were still higher than outflows although lower compared to the previous year. In particular, investments by US to China continued to grow during the year. However, intra-regional registered stronger investment outflows by 231% primarily due to Hong Kong's higher investments to the region.

Table 3.7F: Country Distribution of Net Portfolio Investment Flows by Major Economic Blocks to East Asian Economies, 2006

($ Million)

Source Country	East Asia	US	EU	ROW	Total Value of Investment
Brunei	(155.33)	n/a	n/a	n/a	n/a
Cambodia	n/a	-	n/a	n/a	n/a
Indonesia	13,622.14	6,074.90	2,650.52	17,932.24	40,279.80
Lao PDR	n/a	-	n/a	n/a	n/a
Malaysia	3,621.79	5,650.50	2,949.42	9,558.74	21,780.45
Myanmar	n/a	-	n/a	n/a	n/a
Philippines	58.12	3,432.05	1,756.86	790.95	6,037.98
Singapore	(5,301.58)	14,081.59	3,509.47	(11,469.05)	820.43
Thailand	473.75	1,962.01	411.52	1,264.26	4,111.54
Vietnam	n/a	(68.00)	24.03	n/a	n/a
China	n/a	46,871.00	14,233.86	n/a	n/a
Hong Kong	(53,942.24)	34,581.53	3,700.04	(52,499.06)	(68,159.73)
Japan	(1,759.35)	13,386.98	(27,455.55)	7,702.13	(8,125.79)
South Korea	3,053.76	(5,373.19)	1,225.85	(4,848.62)	(5,942.20)
Total	**(30,237.76)**	**120,599.37**	**3,006.02**	**(102,565.16)**	**(9,197.53)**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm) and author's calculations.

4.2 Bilateral Portfolio Investment Stock—Inflow and Outflow

Tables 3.8A to 3.15B represents the bilateral portfolio investment stock (inflow and outflow) for the ASEAN5 (Indonesia, Malaysia, Philippines, Singapore and Thailand), Hong Kong Japan and South Korea.

4.2.1 Indonesia

Indonesia was experiencing significant increase in portfolio investment in 1997 when the Asian financial crisis hit the country. By 2001, value of investments in the country decreased by 58% and continued to fall until 2002. However, in 2003, portfolio inflows began to recover mainly due to investments from Singapore, Hong Kong, Japan and the United States. Value of investments continued to increase as it rose by 70%. In 2005, investments decreased by more than 30%, with net inflows from Hong Kong slumping by almost 70%. In 2006, value of investments surged with significant contributions from Singapore (increased by 326%) and the United States (213%). In general, portfolio inflows from the region contributed significantly to the value of investments in Indonesia (refer to Table 3.8A).

Portfolio investments by Indonesia on the other hand were relatively small and volatile particularly after 1997. Most of Indonesia's investments were concentrated on Singapore, Hong Kong and the United States (refer to Table 3.8B).

Table 3.8A: Bilateral Portfolio Investments from other Countries (Inflows), 1997–2006

($ Million)

Source Country	Inflows						
	1997	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Brunei	0.00	n/a	n/a	n/a	n/a	0.00	n/a
Cambodia	0.00	n/a	n/a	n/a	n/a	0.00	n/a
Lao PDR	0.00	n/a	n/a	n/a	n/a	0.00	n/a
Malaysia	17.26	1.26	n/a	0.49	29.78	6.49	687.40
Myanmar	0.00	n/a	n/a	n/a	n/a	0.00	0.31
Philippines	0.00	n/a	n/a	n/a	n/a	0.00	n/a
Singapore	5,120.74	1,413.75	642.63	1,783.51	3,363.31	3,535.96	15,064.94
Thailand	9.08	0.20	n/a	n/a	n/a	0.00	n/a
Vietnam	0.00	n/a	n/a	n/a	n/a	0.00	n/a
China, P.R.	0.00	n/a	n/a	n/a	n/a	0.69	0.73
Hong Kong	2,704.46	1,058.17	620.72	832.36	1,576.74	490.49	1,872.54
Japan	203.53	36.46	16.22	76.14	79.98	49.35	173.49
South Korea	170.28	30.91	n/a	24.51	37.25	38.33	18.94
United States	3,492.54	1,366.42	822.10	1,960.75	2,928.06	2,850.64	8,922.15
Total value of investment	**17,432.21**	**7,302.29**	**4,927.64**	**9,977.98**	**16,936.04**	**11,782.73**	**52,401.15**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

Table 3.8B: Bilateral Portfolio Investments to Other Countries (Outflows), 1997–2006

($ Million)

Recipient Country	Outflows						
	1997	2001	2002	2003	2004	2005	2006
Brunei	0.00	n/a	n/a	n/a	n/a	0.00	n/a
Cambodia	0.00	n/a	0.01	0.01	0.01	0.00	n/a
Lao PDR	0.00	n/a	n/a	n/a	n/a	0.00	n/a
Malaysia	0.00	2.11	3.00	1.00	2.00	0.00	7.78
Myanmar	0.00	n/a	n/a	n/a	n/a	0.00	n/a
Philippines	0.00	n/a	4.51	16.10	14.60	4.53	1.75
Singapore	4.60	39.82	23.25	125.24	55.62	217.20	226.40
Thailand	0.00	0.01	n/a	0.01	n/a	0.01	11.80
Vietnam	0.00	n/a	2.37	2.37	2.37	0.00	n/a
China, P.R.	0.00	0.03	n/a	0.02	0.00	101.73	3.18
Hong Kong	210.00	107.43	67.75	54.58	55.97	0.36	26.24
Japan	0.75	3.17	0.23	2.81	0.17	17.00	n/a
South Korea	5.00	0.08	n/a	1.98	2.00	0.50	11.21
United States	55.55	248.95	279.69	450.19	209.34	112.15	108.76
Total value of investment	**1,124.12**	**717.10**	**935.40**	**1,810.39**	**1,381.95**	**1,168.76**	**1,507.37**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

4.2.2 Malaysia

Malaysia's portfolio investments inflows were concentrated in Singapore, Hong Kong, and the US. A decline in the value of investments were experienced in 2001 and 2002 but have since recovered. In 2006, investments by US and Singapore have considerably 113% by 49% respectively (refer to Table 3.9A).

Table 3.9A: Bilateral Portfolio Investments from other Countries (Inflows), 1997–2006

($ Million)

Source Country	Inflows						
	1997	2001	2002	2003	2004	2005	2006
Brunei	1.15	5.86	3.85	9.55	17.27	41.97	37.09
Cambodia	0.00	n/a	0.05	0.06	0.06	0.07	0.00
Indonesia	0.38	28.64	5.74	22.64	12.29	6.39	7.65
Lao PDR	0.00	n/a	n/a	n/a	n/a	0.00	n/a
Myanmar	0.06	0.03	0.03	0.03	n/a	0.00	n/a
Philippines	0.07	4.00	3.30	72.17	3.91	1.90	3.96
Singapore	6,931.29	2,627.69	1,954.97	3,873.73	8,391.55	8,174.11	12,211.24
Thailand	0.15	3.51	6.14	9.03	8.32	9.10	14.16
Vietnam	0.00	0.00	n/a	0.01	7.16	2.72	0.57
China, P.R.	0.16	22.94	0.36	9.20	1.20	5.50	8.21
Hong Kong	1,532.04	2,988.34	1,193.97	1,625.79	2,382.60	2,275.31	3,225.26
Japan	260.09	537.87	292.77	277.91	101.26	99.57	414.84

South Korea	1.96	12.64	n/a	62.60	10.54	31.63	30.02
United States	2,325.55	1,964.25	2,357.48	2,902.22	4,391.91	5,224.66	11,131.81
Total value of investment	**18,996.51**	**15,050.12**	**13,331.61**	**21,487.64**	**33,760.47**	**34,661.46**	**59,848.51**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

Malaysia's investments to other economies have been increasing since 1997 (except in 2003). A huge part of the investment went to Singapore, especially in 2006 when investments increased by 117%. US and Hong Kong also received huge shares in the investment by Malaysia (refer to Table 3.9B).

Table 3.9B: Bilateral Portfolio Investments to Other Countries (Outflows), 1997–2006

($ Million)

Recipient Country	Outflows						
	1997	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Brunei	0.00	n/a	n/a	n/a	n/a	0.00	n/a
Cambodia	0.00	31.47	0.06	n/a	n/a	0.00	n/a
Indonesia	64.54	51.34	34.51	8.46	8.78	25.58	146.68
Lao PDR	0.00	n/a	n/a	n/a	n/a	0.00	n/a
Myanmar	0.00	n/a	n/a	n/a	n/a	0.00	n/a
Philippines	80.27	101.82	26.94	7.74	10.51	10.17	25.77
Singapore	623.84	471.16	435.32	443.41	513.92	751.49	1,628.77
Thailand	59.05	35.98	35.47	6.43	14.70	76.11	53.24
Vietnam	0.00	10.40	19.84	n/a	n/a	0.00	n/a
China, P.R.	6.58	7.97	4.24	40.12	6.28	13.67	12.74
Hong Kong	53.58	75.14	154.98	88.44	156.66	195.55	471.47
Japan	15.61	22.26	20.75	18.92	53.33	51.32	254.57
South Korea	13.21	11.13	69.62	153.56	53.80	70.42	244.94
United States	151.77	208.33	346.00	401.67	478.54	566.51	823.16
Total value of investment	**1,787.96**	**2,279.44**	**2,534.20**	**1,864.97**	**3,248.20**	**3,781.00**	**7,187.60**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

4.2.3 Philippines

Majority of the Philippines' portfolio inflows came from a number of East Asian economies such as Singapore, Hong Kong and Japan but US had the biggest share in the investment. The value of investments have also increased since 2003 and was highest in 2006 (refer to Table 3.10A).

Table 3.10A: Bilateral Portfolio Investments from other Countries (Inflows), 1997–2006

($ Million)

Source Country	Inflows						
	1997	2001	2002	2003	2004	2005	2006
Brunei	--	--	--	--	--	--	--
Cambodia	--	--	--	--	--	--	--
Indonesia	0.00	n/a	4.51	16.10	14.60	4.53	1.75
Lao PDR	--	--	--	--	--	--	--
Malaysia	80.27	101.82	26.94	7.74	10.51	10.17	25.77
Myanmar	--	--	--	--	--	--	--
Singapore	163.85	1,181.42	1,020.07	989.17	921.30	817.78	962.80
Thailand	10.71	1.00	0.00	2.57	3.60	0.53	0.75
Vietnam	--	--	--	--	--	--	--
China, P.R.	--	--	--	--	--	--	--
Hong Kong	n/a	1,239.00	569.00	1,035.00	815.00	1,118.77	973.36
Japan	801.85	1,559.87	1,679.89	1,313.50	1,394.07	1,382.43	1,601.98
South Korea	460.84	109.94	81.40	52.20	37.50	21.80	22.07
United States	7,271.00	4,015.21	4,555.00	5,046.00	5,690.08	7,179.00	10,989.00
Total value of investment	**11,655.60**	**12,725.77**	**11,142.11**	**16,741.28**	**17,000.26**	**22,892.15**	**30,250.14**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

On the other hand, portfolio investments by the Philippines were heavily concentrated in US, while investments to Singapore have improved significantly especially in 2006. Although value of investments by the country have been increasing since 2001, the Philippines though, have been relatively more of a net portfolio recipient than net contributor as shown in Table 3.10B.

Table 3.10B: Bilateral Portfolio Investments to Other Countries (Outflows), 1997–2006

($ Million)

Recipient Country	Outflows						
	1997	2001	2002	2003	2004	2005	2006
Brunei	n/a	n/a	n/a	n/a	0.00	0.00	n/a
Cambodia	n/a	n/a	n/a	n/a	0.00	0.00	n/a
Indonesia	n/a	3.00	4.00	4.00	3.00	8.00	5.56
Lao PDR	n/a	n/a	n/a	n/a	0.00	0.00	n/a
Malaysia	n/a	8.96	10.20	23.93	37.65	267.42	330.12
Myanmar	n/a	n/a	n/a	n/a	0.00	0.00	n/a
Singapore	n/a	61.64	49.75	30.38	26.44	627.67	621.65
Thailand	n/a	0.80	2.81	3.02	3.10	17.65	26.40
Vietnam	n/a	n/a	n/a	n/a	0.00	0.00	n/a
China, P.R.	n/a	n/a	3.05	3.12	1.73	40.84	36.15
Hong Kong	n/a	25.03	98.34	141.66	57.38	114.25	237.23
Japan	n/a	5.47	8.11	13.64	12.26	18.57	7.81
South Korea	n/a	6.54	14.78	36.47	52.17	62.26	66.06
United States	n/a	1,844.21	2,305.95	2,535.15	3,211.96	2,712.89	3,090.84

Total value of investment	**n/a**	**2,134.97**	**2,835.66**	**3,680.66**	**4,915.99**	**5,835.77**	**7,155.77**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

4.2.4 Singapore

Singapore's portfolio inflows have been relatively strong due to huge investments by US although investments by Hong Kong and Japan have made significant increases in recent years. Overall, the value of investments have increased after 1997, most notable of which was in 2006 when it increased by 46% (refer to Table 3.11A).

Table 3.11A: Bilateral Portfolio Investments from other Countries (Inflows), 1997–2006

($ Million)

Source Country	Inflows						
	1997	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Brunei	--	--	--	--	--	--	--
Cambodia	--	--	--	--	--	--	--
Indonesia	4.60	39.82	23.25	125.24	55.62	217.20	226.40
Lao PDR	--	--	--	--	--	--	--
Malaysia	623.84	471.16	435.32	443.41	513.92	751.49	1,628.77
Myanmar	--	--	--	--	--	--	--
Philippines	n/a	61.64	49.75	30.38	26.44	627.67	621.65
Thailand	24.54	106.00	7.00	7.43	8.00	509.07	528.99
Vietnam	--	--	--	--	--	--	--
China, P.R.	--	--	--	--	--	--	--
Hong Kong	n/a	2,685.00	3,383.00	5,604.00	7,004.00	7,096.60	8,682.34
Japan	1,875.34	2,132.59	3,103.13	2,707.05	3,318.23	4,415.24	7,497.53
South Korea	58.26	152.24	144.00	326.40	314.70	316.70	790.22
United States	10,633.00	22,817.61	19,885.00	25,001.00	29,194.59	36,361.00	52,731.00
Total value of investment	**21,452.33**	**50,695.12**	**42,265.01**	**55,185.54**	**68,352.44**	**86,386.97**	**126,084.77**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

Table 3.11B: Bilateral Portfolio Investments from other Countries (Outflows), 1997–2006

($ Million)

Recipient Country	Outflows						
	1997	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Brunei	0.67	n/a	n/a	0.00	0.00	0.00	n/a
Cambodia	0.00	n/a	n/a	0.00	0.00	0.00	n/a
Indonesia	607.70	867.12	2,253.18	2,115.03	4,160.12	6,902.08	5,507.47
Lao PDR	0.00	n/a	n/a	0.00	0.00	0.00	n/a
Malaysia	4,817.71	6,886.15	6,828.02	10,619.73	17,029.64	14,727.25	13,022.68
Myanmar	8.56	5.47	4.99	5.10	2.31	2.15	2.20
Philippines	163.85	1,181.42	1,020.07	989.17	921.30	817.78	962.80

Thailand	595.94	2,361.14	2,147.97	3,675.15	3,526.22	4,036.21	4,234.97
Vietnam	40.41	25.02	22.24	6.61	12.20	52.02	175.47
China, P.R.	496.22	1,446.99	1,519.87	2,442.43	2,575.41	5,758.25	7,673.95
Hong Kong	2,476.26	4,746.66	3,959.10	6,126.45	7,903.32	15,168.52	21,459.74
Japan	952.43	10,550.10	3,816.72	5,100.91	8,530.27	9,740.01	6,502.65
South Korea	235.44	3,215.82	4,096.19	6,062.80	7,487.35	9,692.91	18,698.76
United States	4,708.89	18,011.01	20,915.94	26,410.75	30,711.08	34,799.44	37,087.85
Total value of investment	**22,787.68**	**105,241.48**	**120,377.77**	**149,743.25**	**179,261.18**	**205,702.57**	**244,579.95**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

Portfolio outflows by Singapore were spread to a number of East Asian economies. In 1997, most of the outflows were to US, Hong Kong and Malaysia. However, after 1997, outflows became more diversified as a number of economies were able to receive greater portfolio flows. Most notable of which were the investments to South Korea, which increased by 92% in 2006.Overall, the US still gets the biggest share among the countries (refer to Table 3.11B).

4.2.5 Thailand

Thailand's portfolio inflows were mainly concentrated in four economies namely Singapore, Japan, and US. Total value of investments have also increased since 2001 as it reached 46,456.00 (in millions $) in 2006 (refer to Table 3.12A).

Table 3.12A: Bilateral Portfolio Investments from other Countries (Inflows), 2001, 2005–2006

($ Million)

	Inflows		
Source Country	**2001**	**2005**	**2006**
Brunei	0.21	1.94	6.00
Cambodia	0.01	0.41	0.00
Indonesia	0.06	4.11	3.00
Lao PDR	0.03	0.47	1.00
Malaysia	2.10	50.49	44.00
Myanmar	0.19	11.11	2.00
Philippines	1.54	2.58	2.00
Singapore	2,646.41	5,190.62	4,670.00
Vietnam	0.01	1.69	1.00
China, P.R.	14.45	47.29	43.00
Hong Kong	171.45	1,507.41	2,718.00
Japan	1,317.17	892.93	878.00
South Korea	11.00	7.24	4.00
United States	3,133.95	7,961.65	9,672.00
Total value of investment	**16,940.96**	**40,336.06**	**46,456.00**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

Portfolio outflows on the other hand were concentrated in US and Singapore although investments to Malaysia, Hong Kong and South Korea have significantly increased since 2003 (refer to Table 3.12B).

Table 3.12B: Bilateral Portfolio Investments from other Countries (Outflows), 1997–2006

($ Million)

Recipient Country	Outflows						
	1997	2001	2002	2003	2004	2005	2006
Brunei	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cambodia	4.26	0.00	0.00	0.00	0.00	16.92	19.21
Indonesia	7.88	15.00	15.00	105.88	147.00	0.86	2.18
Lao PDR	0.00	0.00	0.00	0.00	0.00	0.00	1.23
Malaysia	0.00	0.00	0.00	6.35	17.71	111.99	170.42
Myanmar	0.08	0.00	0.00	0.00	0.00	0.00	0.21
Philippines	10.71	1.00	0.00	2.57	3.60	0.53	0.75
Singapore	24.54	106.00	7.00	7.43	8.00	509.07	528.99
Vietnam	4.23	3.00	4.00	23.94	33.90	14.38	13.83
China, P.R.	4.62	4.00	4.00	14.57	10.80	3.85	10.19
Hong Kong	22.42	125.00	29.00	48.22	48.20	30.86	113.74
Japan	0.60	1.00	0.00	1.28	49.90	53.11	9.34
South Korea	0.00	0.00	10.00	0.00	36.99	76.26	127.69
United States	76.45	292.00	1,302.00	1,658.75	456.52	616.11	364.45
Total value of investment	**274.78**	**825.00**	**1,699.00**	**2,833.98**	**1,624.99**	**3,135.60**	**5,144.00**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

4.2.6 Hong Kong

Portfolio investment inflows to Hong Kong were generally strong due to its relatively open economy. US accounted for a significant share in the total investments to the country. In 2006, investment inflows from US have reached $87.5 billion. Singapore's investment to Hong Kong have also been robust especially in 2005 and 2006 when total inflows reached $21.4 billion (refer to Table 3.13A).

Table 3.13A: Bilateral Portfolio Investments from other Countries (Inflows), 1997–2006

($ Million)

Source Country	Inflows						
	1997	2001	2002	2003	2004	2005	2006
Brunei	--	--	--	--	--	--	--
Cambodia	--	--	--	--	--	--	--
Indonesia	210.00	107.43	67.75	54.58	55.97	0.36	26.24
Lao PDR	--	--	--	--	--	--	--
Malaysia	53.58	75.14	154.98	88.44	156.66	195.55	471.47
Myanmar	--	--	--	--	--	--	--
Philippines	n/a	25.03	98.34	141.66	57.38	114.25	237.23
Singapore	2,476.26	4,746.66	3,959.10	6,126.45	7,903.32	15,168.52	21,459.74
Thailand	22.42	125.00	29.00	48.22	48.20	30.86	113.74
Vietnam	--	--	--	--	--	--	--

China, P.R.	--	--	--	--	--	--	--
Japan	6,727.20	6,116.28	4,355.70	7,180.74	9,660.25	8,924.12	11,722.71
South Korea	585.65	406.24	552.70	460.80	281.60	1,018.30	6,600.09
United States	31,395.00	32,047.17	23,657.00	37,661.00	37,350.48	46,225.00	87,518.00
Total value of investment	**74,038.88**	**96,690.27**	**68,928.79**	**108,081.84**	**123,740.85**	**145,924.24**	**233,676.62**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

On the other hand, portfolio outflows by Hong Kong have traditionally been robust in United States. However, in recent years, investment to China have grown significantly especially in 2006 when investments reached $106 billion. Also, investments to Japan and South Korea have been relatively strong as it reached $18 billion and $13 billion respectively (refer to Table 3.13B).

Table 3.13B: Bilateral Portfolio Investments from other Countries (Outflows), 1997–2006

($ Million)

Recipient Country	Outflows						
	1997	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Brunei	n/a	0.00	(c)	n/a	21.00	25.01	2.82
Cambodia	n/a	0.00	n/a	n/a	(c)	(c)	(c)
Indonesia	n/a	0.00	200.00	698.00	578.00	467.45	(c)
Lao PDR	n/a	0.00	n/a	n/a	n/a	n/a	n/a
Malaysia	n/a	2,421.00	2,846.00	3,622.00	4,204.00	4,185.62	4,519.29
Myanmar	n/a	0.00	n/a	n/a	(c)	n/a	n/a
Philippines	n/a	1,239.00	569.00	1,035.00	815.00	1,118.77	973.36
Singapore	n/a	2,685.00	3,383.00	5,604.00	7,004.00	7,096.60	8,682.34
Thailand	n/a	1,147.00	1,604.00	3,568.00	2,298.00	2,218.96	1,420.10
Vietnam	n/a	0.00	8.00	14.00	26.00	(c)	278.35
China, P.R.	n/a	8,416.00	8,194.00	19,676.00	28,126.00	41,299.01	106,132.13
Japan	n/a	9,248.00	8,754.00	10,443.00	9,959.00	16,682.84	18,843.23
South Korea	n/a	5,100.00	7,513.00	10,040.00	11,057.00	12,276.09	13,614.00
United States	n/a	39,253.00	37,020.00	46,670.00	59,648.00	58,155.84	64,867.31
Total value of investment	**n/a**	**205,600.00**	**244,068.00**	**334,912.00**	**400,863.00**	**436,570.42**	**592,482.53**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

4.2.7 Japan

Investments to Japan has been healthy especially from 2001-2006. US have continued to be the biggest investor in Japan as it reached close to $800 billion in 2006. Also, investments from Hong Kong, South Korea and Singapore remained robust during the period 1997, 2001-2006. Investments from China have also significantly particularly in 2006 where investments reached $10.2 billion (refer to Table 3.14A).

Table 3.14A: Bilateral Portfolio Investments from other Countries (Inflows), 1997–2006

($ Million)

Source Country	Inflows						
	1997	2001	2002	2003	2004	2005	2006
Brunei	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cambodia	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indonesia	565.60	157.63	171.36	141.11	191.46	572.70	924.92
Lao PDR	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Malaysia	4,554.06	2,538.18	2,118.23	1,704.80	1,321.97	1,262.65	1,545.73
Myanmar	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Philippines	801.85	1,559.87	1,679.89	1,313.50	1,394.07	1,382.43	1,601.98
Singapore	1,962.29	2,132.59	3,103.13	2,707.05	3,318.23	4,415.24	7,497.53
Thailand	1,611.39	1,037.92	791.54	1,016.16	981.95	746.48	1,191.88
Vietnam	6.16	30.68	32.69	32.89	41.83	11.95	36.99
China, P.R.	4,491.73	1,669.24	1,457.96	2,517.89	4,723.40	4,074.36	10,267.31
Hong Kong	6,808.77	6,116.28	4,355.70	7,180.74	9,660.25	8,924.12	11,722.71
South Korea	8,269.33	5,834.95	6,010.48	5,288.52	6,216.34	7,456.25	9,113.46
United States	335,437.48	490,200.13	499,048.34	620,208.20	694,382.21	747,747.26	797,608.04
Total value of investment	906,661.79	1,289,754.04	1,394,519.67	1,721,314.28	2,009,672.38	2,114,888.38	2,343,482.33

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

Portfolio investments by Japan have also considerably grown since 1997. The biggest investment still goes to the US with more than $574 billion in 2006. Investments to China, Hong Kong, and Singapore have also remained robust (refer to Table 3.14B).

Table 3.14B: Bilateral Portfolio Investments from other Countries (Outflows), 1997–2006

($ Million)

Recipient Country	Outflows						
	1997	2001	2002	2003	2004	2005	2006
Brunei	0.00	562.22	785.65	912.23	1,005.57	996.86	841.53
Cambodia	0.00	0.00	0.00	0.00	n/a	0.00	0.00
Indonesia	2,858.79	468.89	7.51	8.40	8.64	16.95	278.27
Lao PDR	0.00	0.00	0.00	0.00	n/a	0.00	0.00
Malaysia	493.27	3,428.95	3,264.69	2,523.44	2,687.86	2,361.28	2,836.67
Myanmar	0.00	0.00	0.00	0.00	n/a	0.00	0.00
Philippines	0.00	472.69	613.01	519.14	575.30	534.88	442.20
Singapore	17,772.22	27,717.22	18,943.12	18,637.36	23,156.07	26,061.12	28,534.93
Thailand	3,143.52	4,360.17	5,772.20	2,996.59	3,062.05	2,448.38	3,673.57
Vietnam	0.00	126.25	83.40	0.93	n/a	3.39	6.73
China, P.R.	3,006.54	6,853.57	7,548.83	8,520.07	13,042.64	15,992.20	24,680.12
Hong Kong	33,304.35	12,438.32	11,764.17	12,807.47	12,550.23	21,294.04	24,994.29
South Korea	204.69	8,405.01	9,977.48	9,863.68	16,017.92	15,122.49	11,840.27
United States	133,650.63	153,422.43	180,027.12	271,169.23	348,756.21	511,088.99	574,336.75
Total value of investment	586,582.53	665,794.26	610,416.65	867,165.75	1,153,392.77	1,542,421.32	1,762,889.49

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

4.2.8 South Korea

Portfolio inflows to South Korea were dominated by US as it accounted for the majority of the inflows since 1997. In 2006, US investments to South Korea reached 44% of the total value of investments. Singapore and Hong Kong also had substantial investments to South Korea with $18.6 billion and $13.6 billion respectively. Also, investments by Japan have grown moderately since 1997 (refer to Table 3.15A).

Table 3.15A: Bilateral Portfolio Investments from other Countries (Net Inflows), 1997–2006

($ Million)

Source Country	Inflows						
	1997	2001	2002	2003	2004	2005	2006
Brunei	--	--	--	--	--	--	--
Cambodia							
Indonesia	5.00	0.08	n/a	1.98	2.00	0.50	11.21
Lao PDR	--	--	--	--	--	--	--
Malaysia	13.21	11.13	69.62	153.56	53.80	70.42	244.94
Myanmar	--	--	--	--	--	--	--
Philippines	n/a	6.54	14.78	36.47	52.17	62.26	66.06
Singapore	235.44	3,215.82	4,096.19	6,062.80	7,487.35	9,692.91	18,698.76
Thailand	0.00	0.00	10.00	0.00	36.99	76.26	127.69
Vietnam	--	--	--	--	--	--	--
China, P.R.	--	--	--	--	--	--	--

Hong Kong	n/a	5,100.00	7,513.00	10,040.00	11,057.00	12,276.09	13,614.00
Japan	8,250.87	5,834.95	6,010.48	5,288.52	6,216.34	7,456.25	9,113.46
United States	15,185.00	34,474.50	39,573.00	53,429.00	73,613.48	118,507.00	123,875.00
Total value of investment	32,668.13	76,781.30	90,056.43	125,213.79	166,026.03	246,611.06	280,524.82

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

On the other hand, portfolio investments by South Korea have grown since 2001. In fact, investments in 2006 reached $83.5 billion. Majority of the investments by South Korea have gone to US with investments to Hong Kong and Japan growing moderately during the period refer to Table 3.15B).

Table 3.15B: Bilateral Portfolio Investments from other Countries (Net Outflows), 1997–2006

($ Million)

Recipient Country	Outflows						
	1997	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Brunei	0.00	0.00	n/a	n/a	n/a	0.00	0.00
Cambodia	0.00	0.00	n/a	n/a	n/a	0.00	0.00
Indonesia	1,097.19	75.10	82.30	18.00	27.50	6.20	80.79
Lao PDR	0.00	0.00	n/a	n/a	n/a	0.00	0.00
Malaysia	1,011.12	452.41	383.20	158.30	221.00	278.00	252.11
Myanmar	0.00	0.00	n/a	n/a	n/a	0.00	0.00
Philippines	460.84	109.94	81.40	52.20	37.50	21.80	22.07
Singapore	58.26	152.24	144.00	326.40	314.70	316.70	790.22
Thailand	587.54	179.31	42.80	37.50	35.40	39.20	111.87
Vietnam	10.70	21.79	n/a	n/a	0.60	0.40	124.91
China, P.R.	294.97	157.42	42.20	71.50	121.90	101.40	1,832.88
Hong Kong	585.65	406.24	552.70	460.80	281.60	1,018.30	6,600.09
Japan	263.20	176.33	255.60	243.40	1,019.70	1,462.50	2,617.23
United States	2,055.25	3,763.86	5,697.20	7,961.30	12,733.30	19,668.20	30,409.39
Total value of investment	**13,504.57**	**8,034.38**	**11,492.30**	**17,342.50**	**28,368.00**	**43,664.60**	**83,520.55**

Source: International Monetary Fund (http://www.imf.org/external/np/sta/cpis.htm)

5 Challenges

In the past, the size and volatility of portfolio investments in East Asia have created substantial problems for governments as well as private investors. The financial crises in the past two decades were traced by many analysts to the abrupt manner in which capital flows can shift pace and direction. For instance, the Asian financial crisis in 1997-98 resulted in sizeable contraction in output and income in a number of economies such as Indonesia, Thailand, Malaysia and South Korea. The rapid pace of the crisis during that time has raised issues on whether policy makers were too quick to open their capital accounts without putting appropriate policy measures to manage the potential negative effects and volatility of capital flows.

As shown, trends in portfolio investments in East Asia have fluctuated significantly since 1997. After the 1997-98 financial crisis, most of the countries have started to raise its portfolio

investments until 2001. However, in 2002, a downward trend was experienced by most economies in the region. After which, it has recovered again. Portfolio investments in East Asia were somehow concentrated in few economies including Singapore, Japan, Hong Kong and South Korea due to some market imperfections in other East Asian economies. For instance, the development of the financial instruments (such as bond and securities market) in the region has been very slow due to policy controls in a number of economies. Therefore, instead of allowing funds to flow freely within the region, most East Asian economies have diverted their funds outside the region, in particular to US and EU. The easy monetary conditions in the US and EU countries have tend to create conditions of excess liquidity, that in turn may have channelled into investments to developed countries rather than into East Asian economies. These eventually have led to lower intra-regional investment in East Asia with relatively open economies such as Singapore and Hong Kong diverting substantial investments outside the region.

Thus, two key issues arise: What strategy should government implement to encourage greater interest from investors to invest within the region and reduce reliance to economies such as US and EU? What strategies can East Asian economies do to prevent the negative effects of external shocks in the region?

(a) **Sound macroeconomic management**

Greater exchange rate flexibility and a more liberalized interest rate environment is key to coping with the normal or expected volatility from capital flows. However, to deal with unexpected volatility requires sound macroeconomic fundamentals such as adequate level of international reserves and harmonized with appropriate financial safety nets. Although market-based controls on capital flows may provide flexibility to the governments in some countries to alter the interest rate and exchange rate mix temporarily (Williamson, 2005). However, the flexible use of all macroeconomic policy instruments is needed to achieve non-inflationary growth, while smoothing the impact of global shocks in the market. There have been wide differences among countries in the degree of exchange rate flexibility. However, the common ground appears to be that all central banks intervene in the foreign exchange market. Thus, greater exchange rate flexibility can help minimize excessive volatility in the market.

For instance, the global imbalances and the associated shifts in exchange rates, interest rates, and other asset prices, could have significant impact on the soundness of banks and other financial intermediaries. The effective monitoring could help to guide the appropriate macroeconomic policy mix and develop complementary prudential policies. For instance, financial supervision policies can help better determine the impact of common macroeconomic and global shocks affecting the financial system, and the institution specific shocks linked to it.

The volatile portfolio flows in the region as well as the continued problem on global imbalances calls for strengthened macro-prudential surveillance to complement a prompt macro policy response for the region.

(b) **More robust domestic markets**

Significant financial reforms have already taken place in a number of East Asian economies. For instance, banks have been restructured and recapitalized to meet the needs of the market. Prudential regulations and supervision were also strengthened although there remain areas where further strengthening is needed, particularly on-site examination to determine at once problems in the financial sector.

Also, there is a need to further develop the corporate bond markets in the region. Banks are healthy because they have reduced lending to many corporations without adequate credit ratings. A healthy corporate bond market would be able to manage the risk through higher pricing, rather than through lower volumes, and would help bring to the market a more diversified set of investors, including institutional investors who have yet to play a substantial role in capital market deepening in the region.

(c) Development of a deep, transparent and liquid capital markets

As East Asian economies have become more integrated into global markets, their domestic capital markets have to adjust to international norms and practices. Thus, governments need to rely on indirect policy tools. Much of the effectiveness of these instruments depends on the sound functioning and the depth of local capital markets. Most capital markets in the region, particularly bond markets, are still in an early stage of development. They lack depth and liquidity and are subject to many imperfections. Also, domestic markets have been largely insulated from international markets and subject to a variety of controls. These markets have been small in relation to global markets. In recent years, rapid changes have begun to take place as Korea, Malaysia and Thailand for instance, have substantially increased the value of their equity markets. However, this is not enough. As the markets continue to expand, so will the need for more readily available information for effective prudential regulations that minimize market distortions. Reform and liberalization of these markets is necessary to promote the orderly absorption of foreign capital, particularly portfolio investment and short-term money market flows. Also, allowing greater portfolio diversification by banks and expanding options for other asset holders are important elements of financial sector reform. The development of effective prudential regulations and an efficient transaction infrastructure in capital markets is also essential in managing capital flows.

The challenge for East Asian economies is to manage the transition to more open capital markets and dynamic international capital flows. This is so needed so that capital is used effectively to develop more efficient domestic capital markets that will absorb foreign investment without excessive risk and volatility and at the same time allow nationals the benefits of participating in the global capital market.

Thus, countries in earlier stages of development should encourage high domestic saving and investments habits and concentrate on attracting foreign investments in competitive markets. Once domestic capital markets and their regulatory structures are well developed in promoting effective capital allocation, there is now more scope for liberalization of portfolio investment, as experienced by a number of East Asian economies.

(d) Strengthening political and institutional foundations

In the case of Europe, central exchange rates were established with strict capital control while capital flows in Asia are more vulnerable to large fluctuations in private capital flows due to a more liberalized financial market. Therefore, there is a need to further strengthen political as well as institutional foundations to support regional integration. Several studies have indicated that Asia has a relatively short history of economic integration compared with other regions as the ASEAN+3 Summit started only in 1997. Although the Asian Bond Fund (ABF) as well as an expanded Chiang Mai Initiative (CMI) is still in the early stages of existence[15], it can help

[15] See Watanabe and Ogura (2006).

strengthen institutional foundations in the region. The ABF was established in 2003 to foster local bond market. The CMI on the other hand was born out of the agreement in 2000 to enhance currency cooperation in the region thru currency swap agreement. In a standard set-up, a currency swap arrangement creates a mechanism by which countries with strong foreign exchange reserves can provide short-term, hard currency loans to others whose currencies are under pressure or are experiencing balance of payment problems. In recent years, the CMI was further developed into a multilateral arrangement in the hope of strengthening the resource pooling mechanism of the region. There must be stronger economic cooperation between Member Countries as well as find ways in achieving prudent macroeconomic policies as well as sound financial markets to maintain credibility and limit excessive capital outflows if and when a financial crisis occurs again.

Chapter 4: Is East Asia Vulnerable or Immune to Global Economic Shocks? The Role of Intra-Regional Trade, FDI, and Monetary Flows

1 Vector Autoregression

The Vector Autoregressive (VAR) model, developed by Christopher Sims in 1980, generalizes the univariate autoregressive model to dynamic multivariate time series, which is widely used in analyzing the dynamic behavior of time series variables with a purpose for forecasting, structural inference, and policy analysis (Enders, 2004). Sims questioned the theoretical basis imposed on the structural models and argued that if there is true simultaneity among a set of variable, there should not be any a-priori distinction between endogenous and exogenous variables. Sim's VAR resembles simultaneous or structural equation except that several endogenous variables are considered together. Each endogenous variable is explained by its lagged values of all other endogenous variables in the model (Gujarati, 2003). Thus, the VAR methodology is a-theoretic, in which the data generation of the process determines the model.

Stock and Watson (2001) enumerated three general types of VAR. First is the Reduced Form Vector Autoregression, which expresses each variable as a linear function of its own past values, the past values of all other variables being considered, and an uncorrelated error term. Each equation is estimated by ordinary least squares regression. The number of lagged values to include in each equation can be determined by a number of different methods. If the different variables are correlated with each then the error terms in the reduced form model will also be correlated across equations. Second is the Recursive Vector Autoregression, which constructs the error terms in the each regression equation to be uncorrelated with the error in the preceding equations. This is done by including some values as predictors. The result depends on the order of the variables, changing the order, changes the VAR equations, coefficients, and residuals. Third is the Structural Vector Autoregression that uses economic theory to figure relations between variables. It requires identifying assumptions that allow correlations to be interpreted causally. These identifying assumptions can distinguish the causal relationship in the model.

In line with existing studies, the Reduced Form Vector Autoregression approach will be implemented to examine the influences of the shocks to East Asia coming from the United States (US), European Union (EU), Japan, South Korea, People's Republic of China (PRC), and the domestic shocks coming from East Asia or ASEAN-10 itself. The VAR expresses the current value of each *m* series as a weighted average of the past of all series plus a disturbance term ε_t that represents all factors that affect the series but is not taken account explicitly. To begin, A VAR model is specified by Equation 1:

$$Y_t = A_0 + \sum_{k=1}^{p} A_k Y_{t-k} + \varepsilon_t \qquad (1)$$

Where Y_t is a vector of *n* variables to be specified later, A_0 is an $n \times 1$ vector of constant terms, A_k is an *n* x *n* matrix of coefficients, ε_t is an $n \times 1$ vector of stochastic error terms[16], and *p* is the order of autoregression. However, there is uncertainty about ε_t because the past observations of Y_t are unknown and it will have to be estimated from the available data. But such uncertainty is

[16] In the language of Vector Autoregression (VAR), the vector of stochastic error terms is also called impulses, innovations, or shocks (Gujarati, 2003).

lessened, assuming that ε_t is a random vector having a zero mean, the error covariance matrix S is positive definite and ε_t is uncorrelated with past observations of Y_t (Robertson and Tallman, 1999). Hence, the lag order of the VAR (p) is set such that the error terms are serially uncorrelated.

Before the estimation procedure, the maximum lag length must be determined. One way of obtaining the maximum lag length is to use the Akaike Information Criterion (AIC) or the Schwarz Information Criterion (SIC) and choose the model that gives the lowest values for these criteria (Gujarati, 2003).

The interpretation of the VAR (p) shown by Equation 1 is normally based on its moving average representation. By inverting or successive substitution, Equation 1 has a moving average representation show by Equation 2:

$$Y_t = B + \sum_{k=1}^{q} B_k \varepsilon_{t-k} + \varepsilon_t \qquad (2)$$

Where Y_t is a vector of n variables to be specified later, B is an $n \times 1$ vector of constant terms, B_k is an $n \times n$ matrix of coefficients, ε_t is an $n \times 1$ vector of error terms, and q is the moving average order. The lag order of the VAR (q) is set such that the stochastic disturbance terms are non-autocorrelated.

Thus, Y_t is expressed as a linear combination of current and past innovations. Based on Equation 2, the variance decompositions and impulse response functions can be generated and will serve as bases for our inferences. Basically, variance decompositions partition the variations in a variable of interest to shocks in other variables in the system including its own innovations (Gujarati, 2003). Thus, they provide natural measures of relative importance of various shocks in explaining the concerned variable (Enders, 2004). Meanwhile, the impulse-response functions trace the responses of the variables in the system to one standard deviation shocks in other variables (Gujarati, 2003). They capture the directions, magnitudes and persistence of a variable's responses to impulses in the system (Enders, 2004).

One important aspect that needs to be pointed out, which pertains to the generation of variance decompositions and impulse-response functions, is that innovations in Equation 2 may be contemporaneously correlated. This means that a shock in one variable may work through the contemporaneous correlation with innovations in other variables. Since isolated shocks to individual variables can not be identified due to contemporaneous correlation, the responses of a variable to innovations in another variable of interest can not be adequately represented (Enders, 2004). To solve this identification problem, Sims' (1980) suggest an empirical strategy that orthogonalizes the innovations using the Cholesky factorization (Enders, 2004).

2 Data Requirements

The data that were used in this study are quarterly data spanning from the fourth quarter of 1991 (4Q1991) to the first quarter of 2008 (1Q2008) retrieved from the International Financial Statistics (IFS) database. The VAR (p) model represented by Equation 1 and Equation 2 consist of the following variables: East Asian Gross Domestic Product (EAGDP), East Asian Imports (EAM), East Asian Exports (EAX), East Asian Inflation (EAINF), East Asian Nominal Effective Exchange Rate (EANEER), United States' GDP (USGDP), United States' Imports (USM), European Union's GDP (EUGDP), European Union's Imports (EUM), ASEAN-10's GDP

(ASEANGDP), ASEAN-10's Imports (ASEANM), Japanese GDP (JAPGDP), Japanese Imports (JAPM), South Korean GDP (KORGDP), South Korean Imports (KORM), PRC's GDP (PRCGDP), and PRC's Imports (PRCM).

3 Preliminary Tests

3.1 Test for Stationarity

Before proceeding to the VAR implementation and analysis, we first subject each time series to unit root testing. Empirical work based on time series data assumes that the underlying time series is stationary. According to Gujarati (2003), a stochastic process[17] is said to be stationary "if its mean and variance are constant over time and the value of the covariance between the two time periods depends only on the distance or lag between the two time periods and not the actual time at which the covariance is computed." Moreover, according to Gujarati (2003), stationarity is necessary in order to guard against spurious regressions[18] wherein there would exist nonsensical relationship when one non-stationary time series endogenous variable is regressed against one or more exogenous non-stationary time series variables.

In order to determine the unit root of all the variables in the system, which is the number of times a non stationary time series Y_t has to be differenced to make it stationary (Gujarati, 2003). A formal test specifically the *Augmented Dickey – Fuller (ADF) Unit Root Test* will be implemented to determine whether the variable is already stationary at level or whether it would need differencing to make it stationary. The ADF is based on the regression equation:

$$\Delta Y_{it} = c_i + \tau_i t + \delta_i Y_{it-1} + \sum_{j=1}^{p} \alpha_{ij} \Delta Y_{it-j} + \varepsilon_{it} \quad (3)$$

Where Y_t is the variable of interest at time t. Under the ADF Unit Root Test, its null hypothesis is that there is unit root and the order of integration is 1. The lag parameter, p, is chosen so that the resulting residuals have zero serial correlation.

According to Gujarati (2003), in an m-variable VAR model, all the m variables must be jointly stationary. If the m variables are non-stationary there is a need to transform the time series data appropriately through differentiation depending on the order of integration. However, Harvey (1990) as cited in Gujarati (2003), the results derived from the transformed data may be unsatisfactory so he noted that the usual approach by VAR aficionados is to work in level values even if the series is non-stationary. The regression could be estimated in first-differences, but then any long-term information carried by the levels of the variables is lost (Mulligan, 2003). This study will generate VAR results using level values of the time series and using de-trended time series using the Hodrick-Prescott filter, which is a mathematical tool used in macroeconomics, especially in real business cycle theory. It is used to obtain a smoothed non-linear representation of a time series, one that is more sensitive to long-term than to short-term shocks or fluctuations. The adjustment of the sensitivity of the trend to short-term fluctuations is achieved by modifying a multiplier λ (Enders, 2004).

[17] A random or stochastic process is a collection of random variables ordered in time (Gujarati, 2003).
[18] There is spurious regression when one obtains a very high R^2 or coefficient of determination greater than 90 percent even though there is no meaningful relationship among variables. Also, there is spurious regression when the R^2 is grater than the Durbin – Watson statistic (Gujarati, 2003).

3.2 Johansen–Juselius Cointegration Test

Cointegration is an econometric property of time series variables wherein if two or more series are themselves non-stationary, but a linear combination of them is stationary, then the series are said to be cointegrated. Moreover, cointegration is the presence of long run co-movement among the variables of interest and can be determined using the Johansen–Juselius Cointegration Test (Johansen, 1988 and Johansen and Juselius, 1990). Such test is used to establish how many cointegrating vectors the system has. It includes the "λ-max" test, for hypotheses on individual eigenvalues, and the "trace" test, for joint hypotheses. Suppose that the eigenvalues λ_i are sorted from largest to smallest. The null hypothesis for the "λ-max" test on the i^{th} eigenvalue is that $\lambda_i = 0$. The corresponding trace test, instead, considers the hypothesis $\lambda_j = 0$ for all $j \geq i$. Such test was implemented to determine whether there is long run co-movement among all the variables of interest in the VAR (p) model.

3.3 Vector Autoregression Model Specification

The VAR (p) model to be estimated, that will determine the impact of domestic and external shocks to East Asia and ASEAN-10. The specific VAR (p) models of interest are shown by Equations 4 to 7. Note that the optimal lag structure p of the VAR model is determined by the lowest AIC and SIC.

$EAGDP_t = f(USGDP_t, USM_t, EUGDP_t, EUM_t, EAGDP_t, EAM_t)$	(4)
$EAX_t = f(USGDP_t, USM_t, EUGDP_t, EUM_t, EAGDP_t, EAX_t)$	(5)
$ASEANGDP_t = f(USGDP_t, EUGDP_t, ASEANGDP_t, ASEANX_t, JAPGDP_t, KORGDP_t, PRCGDP_t)$	(6)
$ASEANGDP_t = f(USM_t, EUM_t, ASEANGDP_t, ASEANX_t, JAPM_t, KORM_t, PRCM_t)$	(7)
$ASEANGDP_t = f(EAGDP_t, EAX_t, EANINF_t, EANEER_t, USGDP_t, EUGDP_t, PRCGDP_t, ASEANGDP_t)$	(8)
$ASEANGDP_t = f(EAGDP_t, EAX_t, EANINF_t, EANEER_t, USM_t, EUM_t, PRCM_t, ASEANGDP_t)$	(9)
$PRCGDP_t = f(USGDP_t, USM_t, EUGDP_t, EUM_t, EAGDP_t, PRCGDP_t, ASEANGDP_t)$	(10)

4 Results and Discussion

For the complete details and sub-results of the VAR estimation procedure, preliminary tests, Variance Decomposition, and Impulse Response, please refer to Appendix for Chapter 4.

4.1 $EAGDP_t = f(USGDP_t, USM_t, EUGDP_t, EUM_t, EAGDP_t, EAM_t)$

4.1.1 VAR Estimation Results

VAR system, lag order 8 Equation: eagdp	
observations 1993:4-2008:1 (T = 58)	
Log-likelihood	-2612.3771
Determinant of covariance matrix	5.3364941e+031
Portmanteau test	LB(14) = 832.471 (df = 216, p-value 0.000000)
AIC	100.2199
BIC	110.6642
HQC	104.2882

Variable	Coefficient
const	18834.8
eam_1	0.0166173
eam_2	-0.00721537
eam_3	0.00205953
eam_4	0.00544608
eam_5	0.00198841
eam_6	-0.0363096
eam_7	-1.94917E-05
eam_8	0.00204523
usgdp_1	1.50738
usgdp_2	-2.69084
usgdp_3	-0.573335
usgdp_4	-0.0474974
usgdp_5	2.74986
usgdp_6	0.142185
usgdp_7	2.50551
usgdp_8	-3.10172
usm_1	0.00716955
usm_2	0.00848465
usm_3	-0.0144150
usm_4	-0.0438496
usm_5	0.0247883
usm_6	0.0501960
usm_7	-0.0107942
usm_8	-0.00927548
eugdp_1	-14.1468
eugdp_2	20.4373
eugdp_3	-20.3640
eugdp_4	9.91501
eugdp_5	-23.8460
eugdp_6	-5.61848
eugdp_7	4.65768
eugdp_8	6.28750
eum_1	1.76594E-05
eum_2	1.17335E-05
eum_3	1.90429E-05
eum_4	-5.77011E-07
eum_5	-2.62896E-05
eum_6	9.02584E-06
eum_7	-5.98688E-06
eum_8	3.99959E-06
eagdp_1	-0.266685
eagdp_2	-0.615012
eagdp_3	-0.353297
eagdp_4	-0.255197
eagdp_5	-0.247185
eagdp_6	0.147711
eagdp_7	0.396151
eagdp_8	0.402873

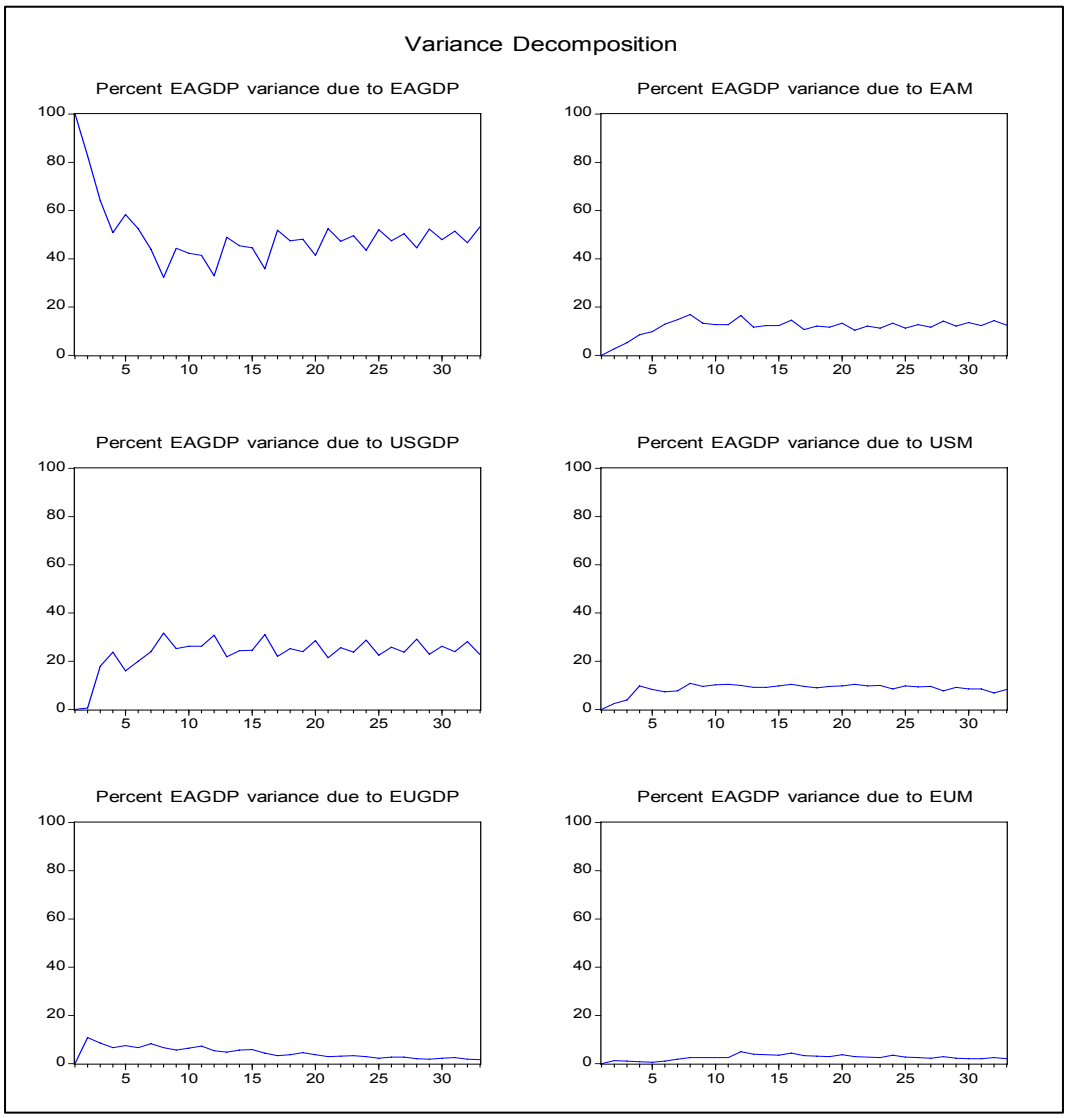
Conventional inference is valid even when the structural variables are nonstationary, provided the residuals are white-noise processes with no serial correlation. It is generally assumed that

adding a sufficient number of lagged difference terms in the disequilibrium adjustment process is always sufficient to guarantee white-noise errors (Mulligan, 2003; Gujarati, 2003).

It can be seen from the results that none of the variables as well as its lags are significant in influencing *EAGDP*. This can be associated with a low observation count given a high lag structure.

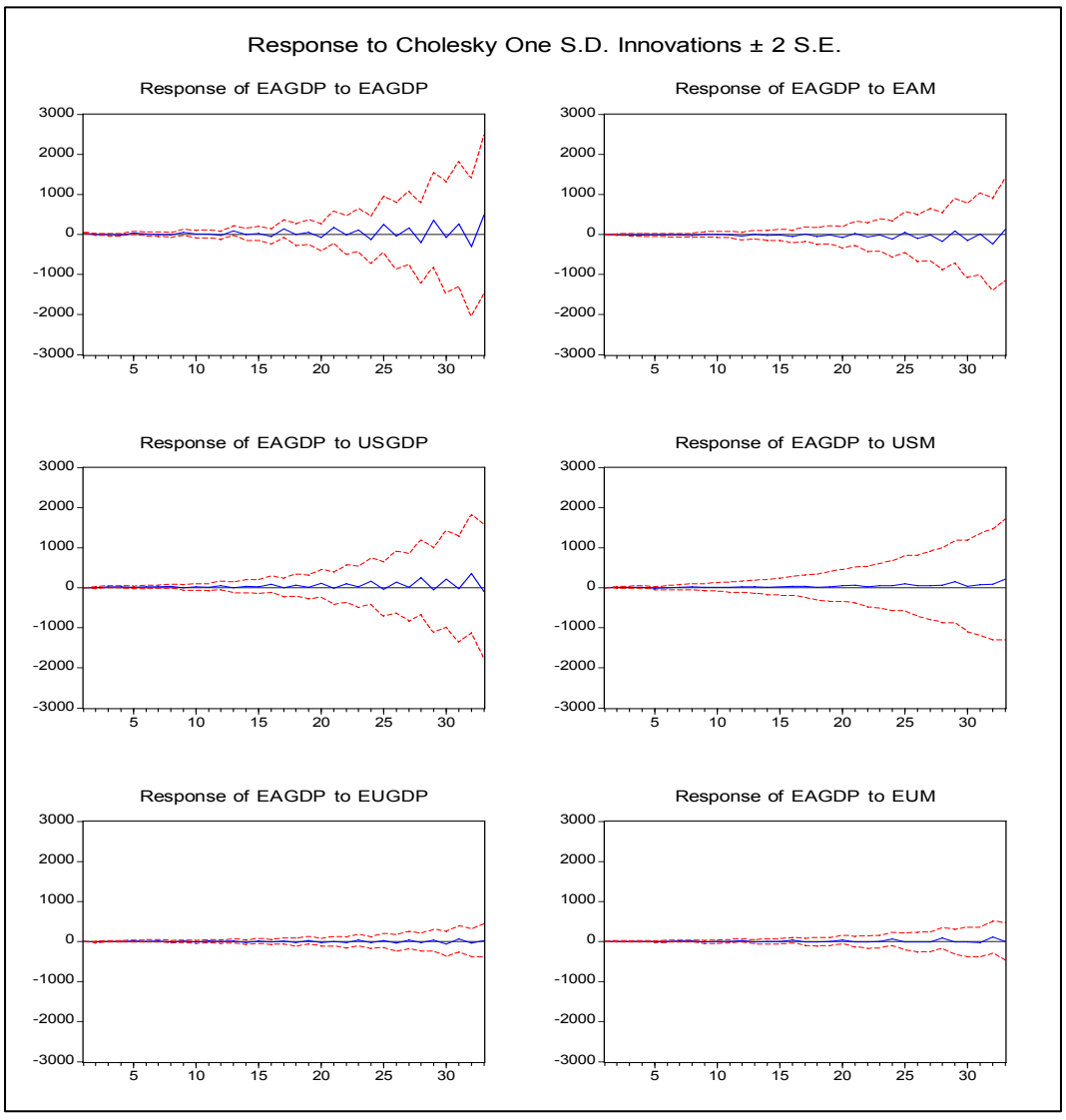
4.1.2 Variance Decomposition

Most of the *EAGDP* variations are accounted mostly by domestic innovations coming from previous impacts of *EAM*, explained by more than 70 percent after the first quarter and more than 40 percent at two quarter horizon onwards. Comparatively, the disturbances in the *USM* have more explanatory power in accounting for variations in *EAGDP* than *EUM*. Namely, more than 40 percent of the forecast error variance of *EAGDP* is attributed to shocks in *USM* at the 12-quarter to 22-quarter horizons. Meanwhile, the *USGDP* innovations explain only 10 percent, the most, of the shocks to *EAGDP*. Note that the influences of import variables are more immediate. After 33 quarters, approximately 40 percent of the variance in *EAGDP* has been attributable to variation in *USM*, over the period studied.



4.1.3 Impulse Responses

Results, at least qualitatively, are reflected in the impulse-response functions plotted. The response functions are plotted together with two standard deviation bands. Generally stated, if the bands do not encompass zero, then the responses are significantly different from zero. The results show that the shocks in *EAGDP* are mainly domestically generated. Indeed, domestic disturbances seem to be the major source of their *EAGDP* fluctuations. We may note that the response of *EAGDP* to one standard deviation shock in *EAM*, *EUM*, *EUGDP*, and *USGDP* is not significant. Meanwhile, *EAGDP* reacts negatively and significantly to innovations in *USM* in quarter 6 to 9. Thus, given the variance decomposition results, the effect of *USM* is relatively more important than the *USGDP* effect in accounting for fluctuation in *EAGDP*.



4.2 $EAX_t = f(USGDP_t, USM_t, EUGDP_t, EUM_t, EAGDP_t, EAX_t)$

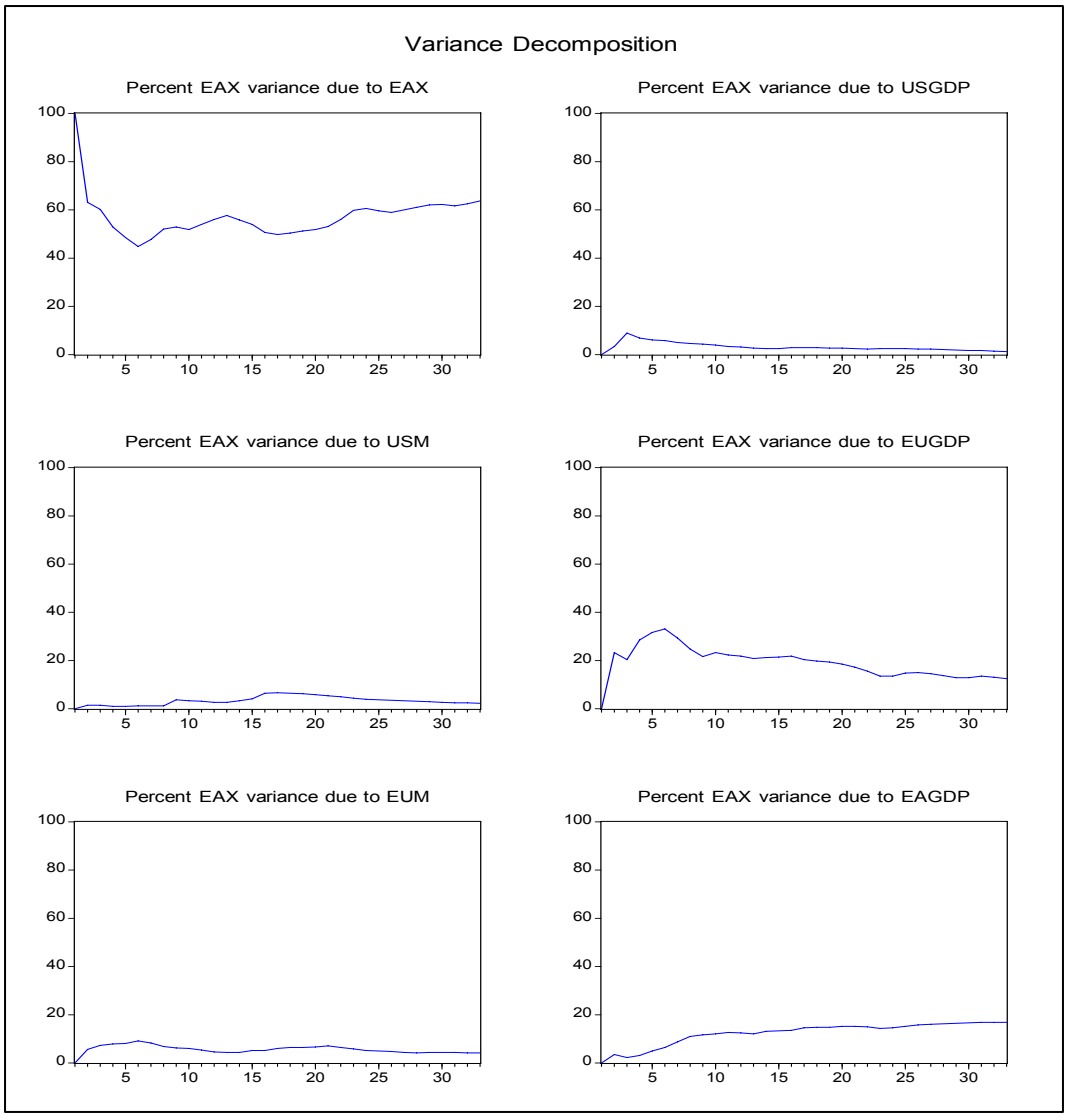
4.2.1 VAR Estimation Results

VAR system, lag order 8 Equation: eax	
observations 1993:4-2008:1 (T = 58)	
Log-likelihood	-2528.9331
Determinant of covariance matrix	3.0034874e+030
Portmanteau test	LB(14) = 1023.52 (df = 216, p-value 0.000000)
AIC	97.3425
BIC	107.7868
HQC	101.4108
Variable	**Coefficient**
const	412063
eax_1	0.532481
eax_2	0.788706**
eax_3	0.455981
eax_4	-0.242458
eax_5	-0.948055*
eax_6	0.954005
eax_7	1.14992**
eax_8	-0.640738
usgdp_1	148.595**
usgdp_2	-7.47110
usgdp_3	-44.1702
usgdp_4	63.7946
usgdp_5	-177.440*
usgdp_6	-86.7295
usgdp_7	64.9156
usgdp_8	53.6626
usm_1	1.02231*
usm_2	-2.22228***
usm_3	-0.799703
usm_4	2.89518***
usm_5	1.07068
usm_6	-2.61563*
usm_7	-1.58752*
usm_8	2.52185**
eugdp_1	-1313.37*
eugdp_2	559.055
eugdp_3	466.119
eugdp_4	-715.604
eugdp_5	1192.64*
eugdp_6	-535.487
eugdp_7	-960.574
eugdp_8	676.024
eum_1	-0.000548432
eum_2	-4.61975E-05
eum_3	-0.000814345

eum_4	0.000221149
eum_5	-0.000333767
eum_6	0.000452865
eum_7	0.000220751
eum_8	-0.00135309**
eagdp_1	24.8078**
eagdp_2	-4.84518
eagdp_3	-2.17859
eagdp_4	-2.25956
eagdp_5	-4.80440
eagdp_6	17.0626*
eagdp_7	-28.4009**
eagdp_8	-7.40234

It can be seen from the results that all variables are significant in influencing *EAX* at various lags. *USM* is statistically significant in influencing *EAX* at various lags while *EUM* has an 8th lag delay in influencing *EAX*. It can also be noted that the GDP of EA, EU and US have no long delay in influencing *EAX*.

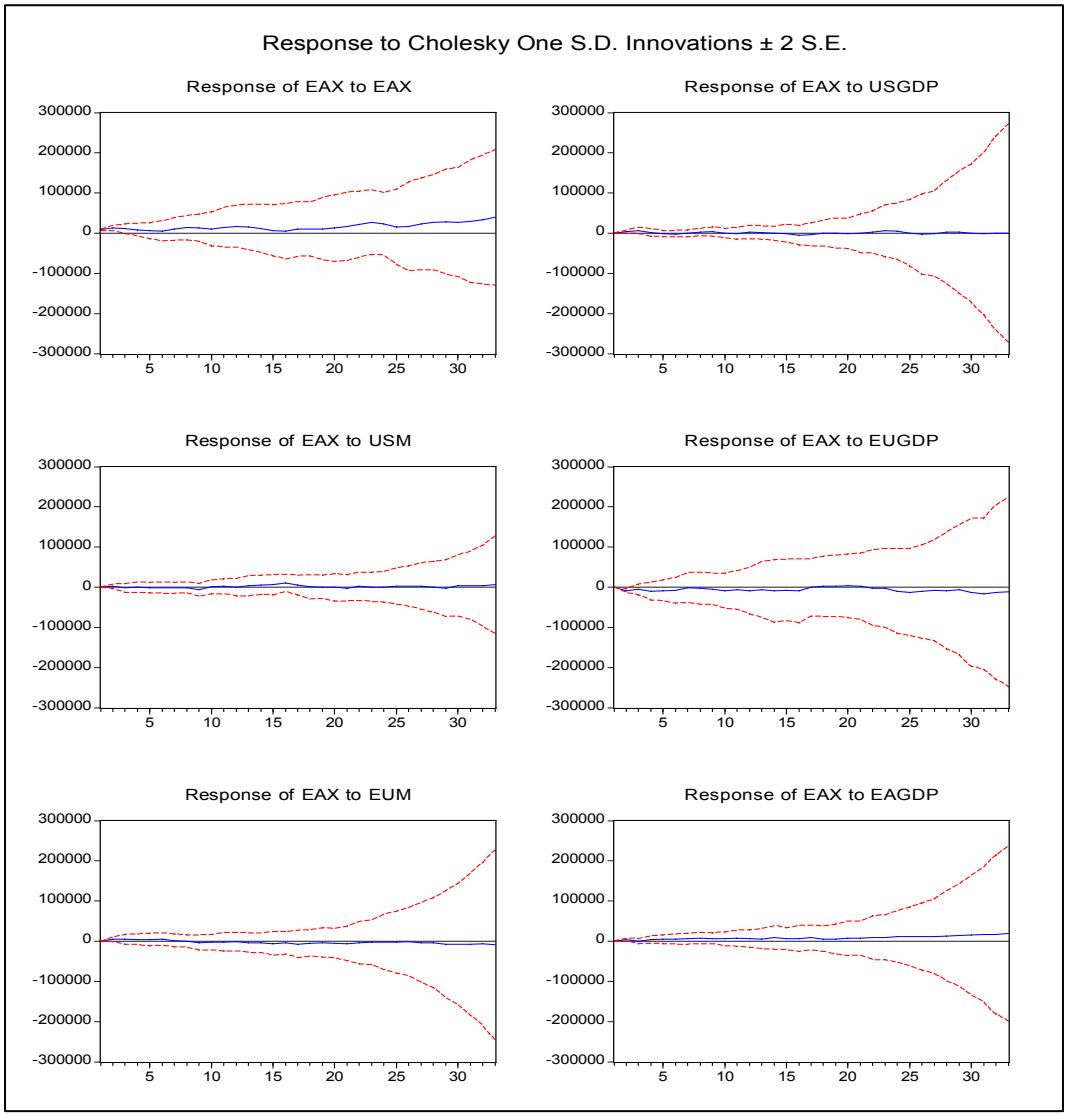
4.2.2 Variance Decomposition



Most of the *EAX* variations are accounted mostly by domestic innovations coming from previous impacts of *EAM*, explained by more than 60 percent after the first quarter and more than 40 percent at two quarter horizon onwards. Comparatively, the disturbances in the *USM* have more explanatory power in accounting for variations in *EAX* than *EUM*. Namely, more than 40 percent of the forecast error variance of *EAX* is attributed to shocks in *USM* at the 8-quarter to 33-quarter horizons. Meanwhile, the *USGDP* innovations are weaker than innovations in *EUGDP*. However, the variance decomposition shows that all other variables aside from *EAX* do not cause variations at the first lag.

4.2.3 Impulse Responses

Results show that the shocks in *EAX* are mainly domestically generated. Indeed, domestic disturbances seem to be the major source of their *EAX* fluctuations specifically *EAX* itself. We may note that the response of *EAX* to one standard deviation shock in *USGDP*, *EUGDP*, *EUM*, and *EAGDP* is not significant for longer periods. Meanwhile, *EAX* reacts negatively and significantly to innovations in *EUGDP* in quarter 1 to 2. Thus, given the variance decomposition results, the effect of *EAX* is relatively more important than the other variables in accounting for fluctuation in *EAX*.



4.3 $ASEANGDP_t = f(USGDP_t, EUGDP_t, ASEANGDP_t, ASEANX_t, JAPGDP_t, KORGDP_t, PRCGDP_t)$

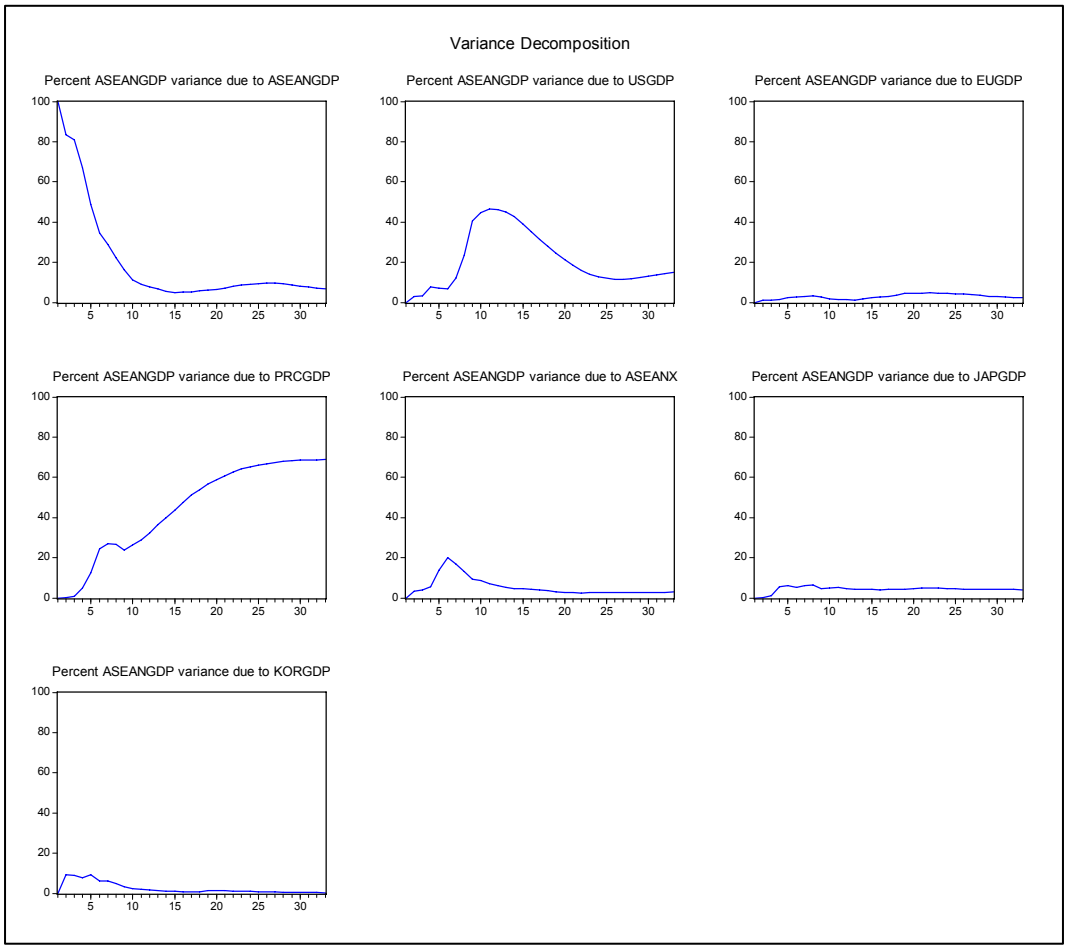
4.3.1 VAR Estimation Results

VAR system, lag order 6 Equation: aseangdp	
observations 1993:2-2008:1 (T = 60)	
Log-likelihood	-2761.4055
Determinant of covariance matrix	2.2290434e+031
Portmanteau test	LB(15) = 905.385 (df = 441, p-value 0.000000)
AIC	102.0802
BIC	112.5868
HQC	106.1899
Variable	**Coefficient**
const	366454**
aseangdp_1	0.310124
aseangdp_2	-0.165193
aseangdp_3	-0.0853306
aseangdp_4	0.0785419
aseangdp_5	-0.0783268
aseangdp_6	-0.0922898
usgdp_1	19.8895
usgdp_2	-13.3892
usgdp_3	-22.3184
usgdp_4	30.7825
usgdp_5	-12.7605
usgdp_6	-41.0133*
eugdp_1	-27.9371
eugdp_2	153.216
eugdp_3	69.4362
eugdp_4	-19.6155
eugdp_5	29.6566
eugdp_6	37.4988
prcgdp_1	8.89506
prcgdp_2	11.3269
prcgdp_3	22.7866**
prcgdp_4	28.1709***
prcgdp_5	20.9698
prcgdp_6	20.1267
aseanx_1	-0.0757765
aseanx_2	0.174864
aseanx_3	-0.0388850
aseanx_4	0.215406
aseanx_5	0.298176
aseanx_6	-0.338839*
japgdp_1	-0.188683
japgdp_2	-0.0854761
japgdp_3	-0.147437

japgdp_4	-0.152934
japgdp_5	-0.0539248
japgdp_6	-0.107431
korgdp_1	0.536424*
korgdp_2	-0.635290*
korgdp_3	0.394639
korgdp_4	0.253784
korgdp_5	-0.533687
korgdp_6	0.585381*

It can be seen from the results that *USGDP* is significant in positively influencing *ASEANGDP* specifically on the seventh and eighth lag. However, the influence of USM is negatively significant in influencing *ASEANGDP*. On the other hand, EUGDP and EUM are positively significant in influencing *ASEANGDP* specifically on the the fifth and eighth lag respectively. Japan and Korea also have their own respective shocks to ASEANGDP specifically their GDPs and Imports. Likewise, the first lag of *ASEANGDP* has its own influence to the contemporaneous value of *ASEANGDP*. EUM is the only variable that is insignificant in influencing *ASEANGDP*. From the results, it can be implied that Asian variables are more influential to *ASEANGDP* compared with US and EU variables; however, US variables are more significant in influencing *ASEANGDP* compared to EU variables.

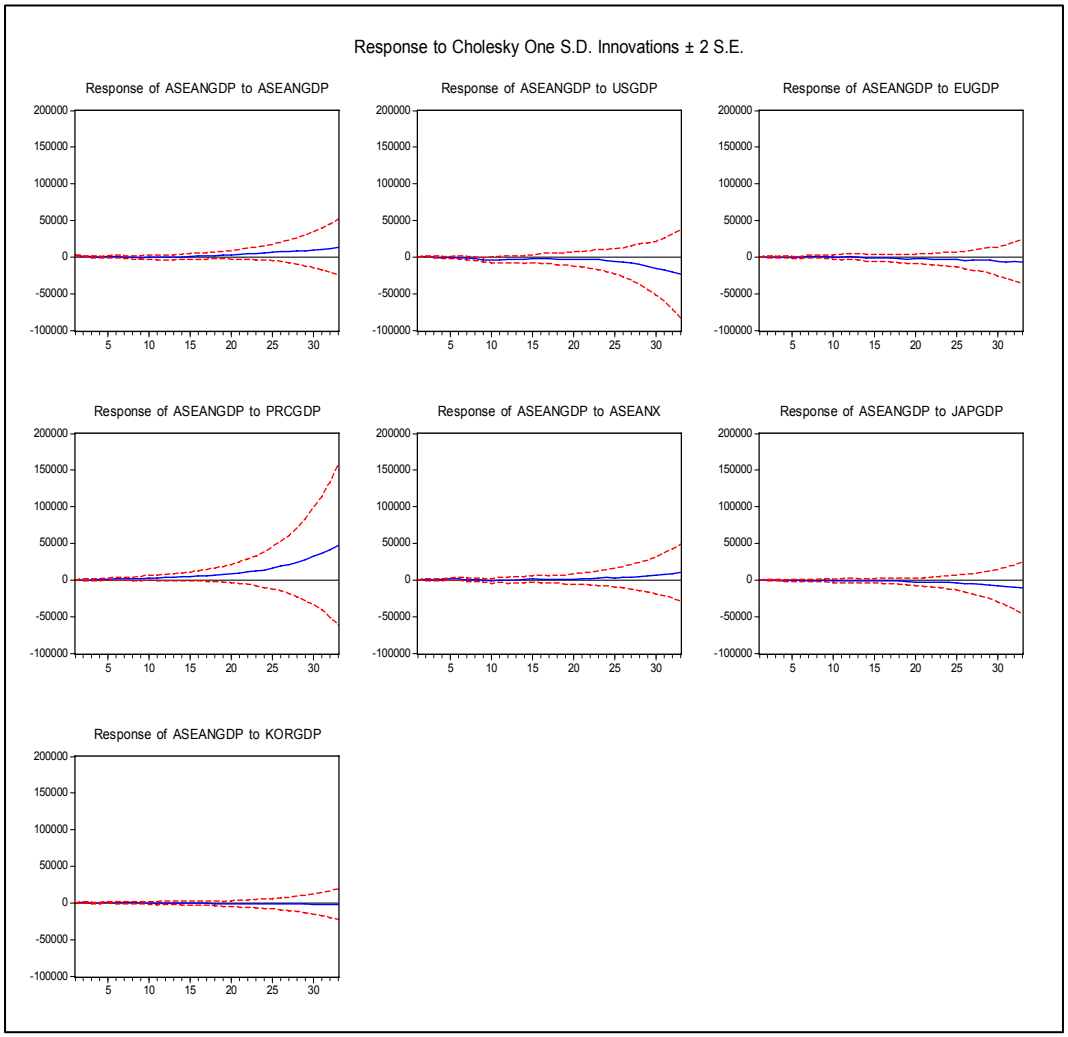
4.3.2 Variance Decomposition



Most of the *ASEANGDP* variations are accounted mostly by domestic innovations coming from previous impacts of *ASEANGDP*, explained by more than 65 percent after the first quarter and roughly about 10 to 40 percent at succeeding horizon. Comparatively, the disturbances in *USGDP, JAPGDP* and *KORGDP* have more explanatory power in accounting for variations in *ASEANGDP* than *EUGDP*. Roughly about 20 percent of the forecast error variance of *ASEANGDP* is attributed to shocks in *JAPGDP* at latter horizons while *USGDP* innovations explain 40 percent of the variation in *ASEANGDP* from 9 to 20 quarter period. Note that the influences of *JAPM* are not immediate. After 41 quarters, approximately 12 percent of the variance in *ASEANGDP* has been attributable to variation in *USM*, over the period studied.

4.3.3 Impulse Responses

Results show that the variations in *ASEANGDP* are mainly domestically generated. Indeed, domestic disturbances seem to be the major source of the *ASEANGDP* fluctuations specifically *ASEANGDP* itself. We may note that the responses of *ASEANGDP* to one standard deviation shock in foreign variables are not significant. Meanwhile, *ASEANGDP* reacts stable to innovations in *JAPGDP* and *KORGDP* for 20 quarters. Thus, given the variance decomposition results, the effect of Asian variables are relatively more important than non-Asian variables in accounting for fluctuations in *ASEANGDP*.



4.4 $ASEANGDP_t = f(USM_t, EUM_t, ASEANGDP_t, ASEANX_t, JAPM_t, KORM_t, PRCM_t)$

4.4.1 VAR Estimation Results

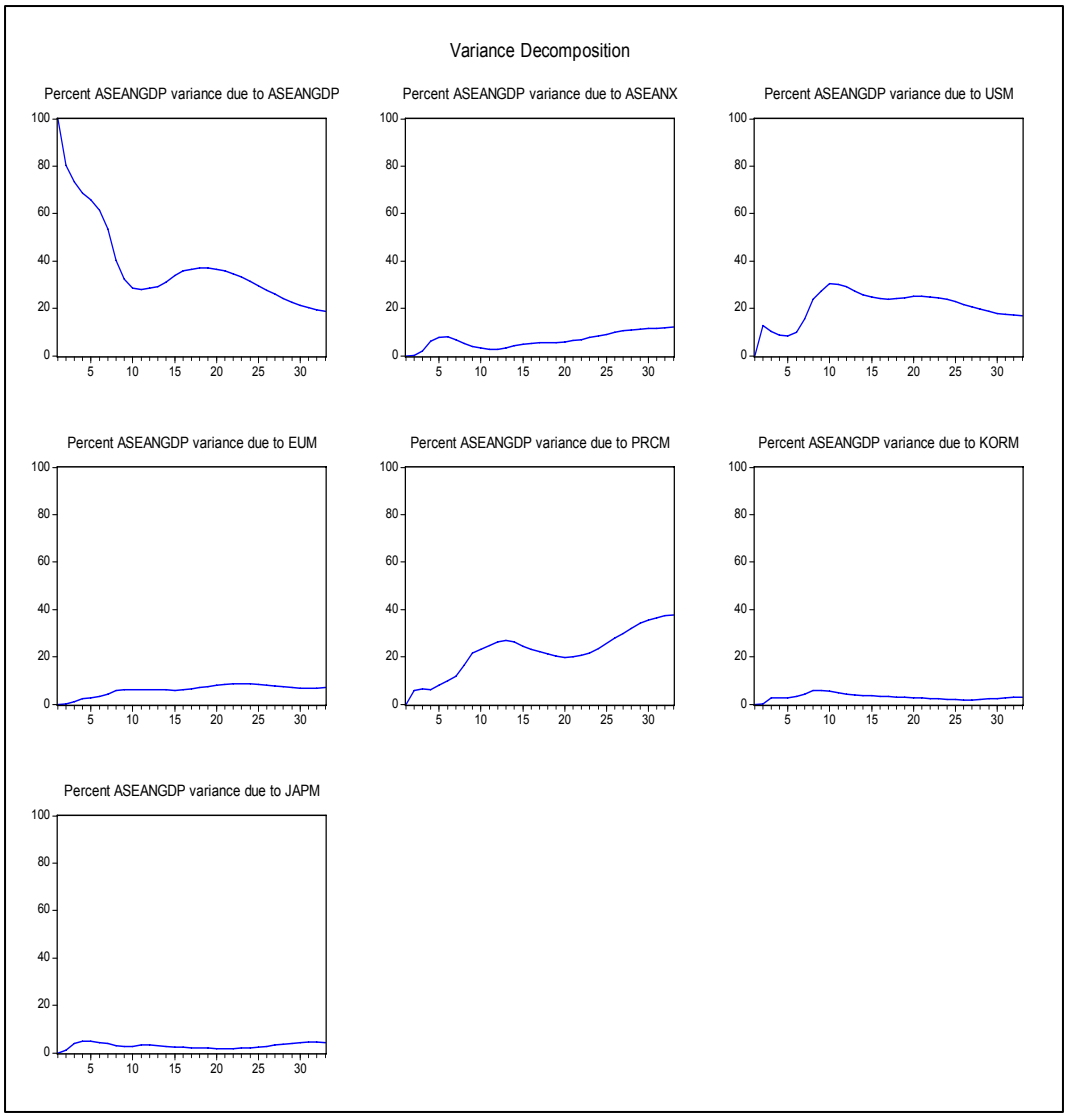
VAR system, lag order 6 Equation: aseangdp	
observations 1993:2-2008:1 (T = 60)	
Log-likelihood	-3701.7824
Determinant of covariance matrix	9.151006e+044
Portmanteau test	LB(15) = 903.692 (df = 441, p-value 0.000000)
AIC	133.4261
BIC	143.9327
HQC	137.5358
Variable	**Coefficient**
const	31776.2
aseangdp_1	0.213896
aseangdp_2	0.0616386
aseangdp_3	-0.109014
aseangdp_4	-0.0246783
aseangdp_5	-0.287182
aseangdp_6	-0.0898237
aseanx_1	-0.517017
aseanx_2	-0.0562476
aseanx_3	0.0308317
aseanx_4	0.317469
aseanx_5	0.312590
aseanx_6	0.196499
usm_1	0.212310
usm_2	-0.0855471
usm_3	0.101059
usm_4	-0.296300
usm_5	-0.332807
usm_6	0.244005
eum_1	-0.000157665
eum_2	4.97912E-05
eum_3	0.000186320
eum_4	-7.04245E-05
eum_5	-7.53721E-05
eum_6	-7.95070E-05
prcm_1	0.288647
prcm_2	0.108124
prcm_3	0.184481
prcm_4	0.176096
prcm_5	0.0381946
prcm_6	-0.201809
korm_1	-0.194233
korm_2	0.388566
korm_3	-0.620219
korm_4	0.402702
korm_5	-0.0628331

korm_6	0.246241
japm_1	264.741
japm_2	274.139
japm_3	-182.265
japm_4	246.669
japm_5	-143.121
japm_6	-382.074

From Equation 1, it can be seen from the results that no variables are significant in influencing *ASEANGDP* but from Equation 2, it can be seen that the imports of Japan, China, US, and EU has a significant influence on *ASEANX*.

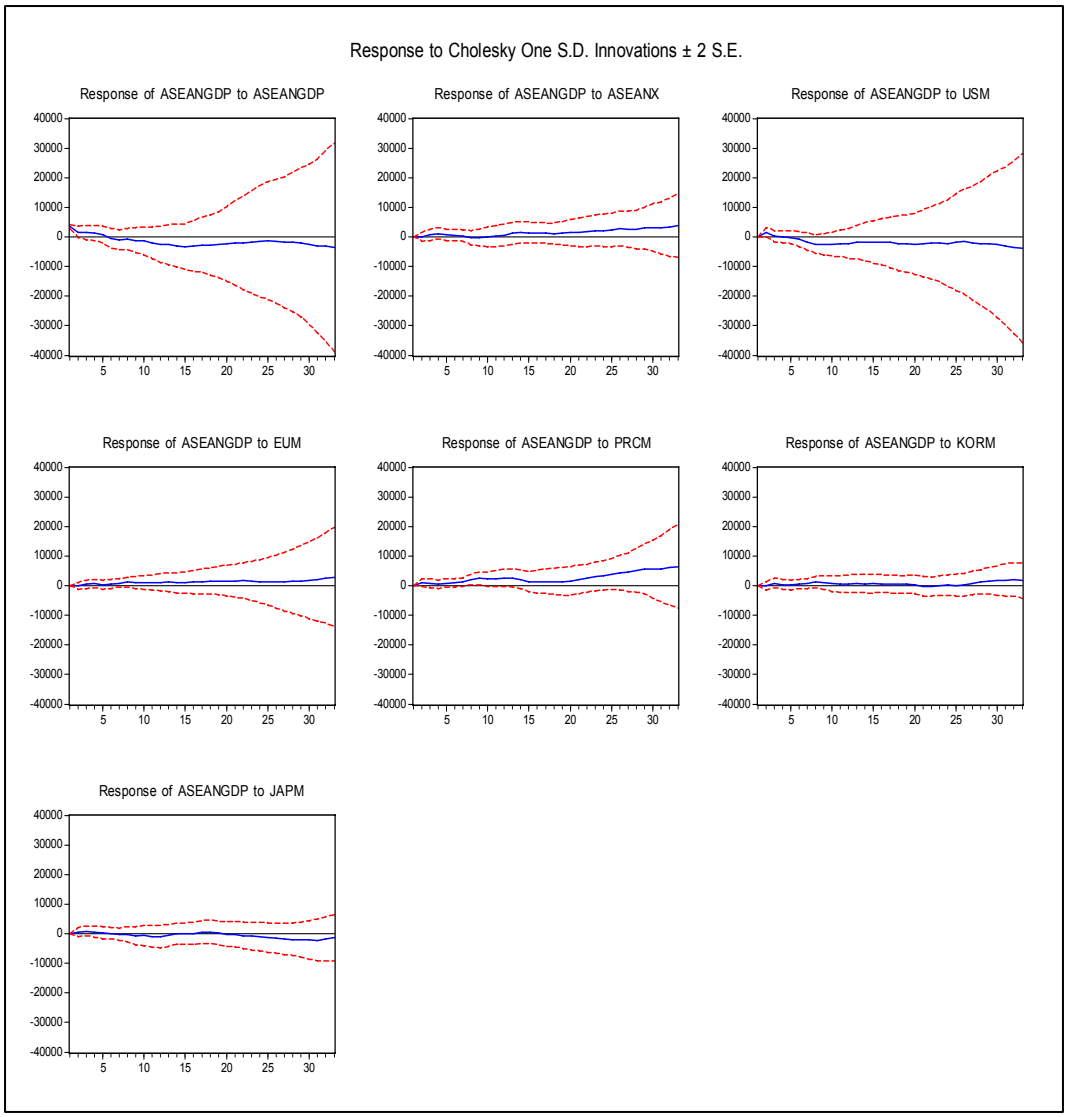
4.4.2 Variance Decomposition

Most of the *ASEANGDP* variations are accounted mostly *PRCM* and *USM*. Following next are the variations from *EUM*, *JAPM*, and *KORM*. Note that *PRCM* causes more variation in *ASEANGDP* than *USM*.



4.4.3 Impulse Responses

Results show that the shocks in *ASEANGDP* due to ASEANGDP, USM, EUM, and PRCM are significant. The interaction of ASEAN to major trading partners cause shocks to the region as a whole. PRCM has the longest significant shocks to ASEANGDP compared to other regions/countries.



4.5 $ASEANGDP_t = f(EAGDP_t, EAX_t, EANINF_t, EANEER_t, USGDP_t, EUGDP_t, PRCGDP_t)$

4.5.1 VAR Estimation Results

VAR system, lag order 6 Equation: aseangdp	
observations 1993:2-2008:1 (T = 60)	
Log-likelihood	-2002.7693
Determinant of	1.3591266e+019

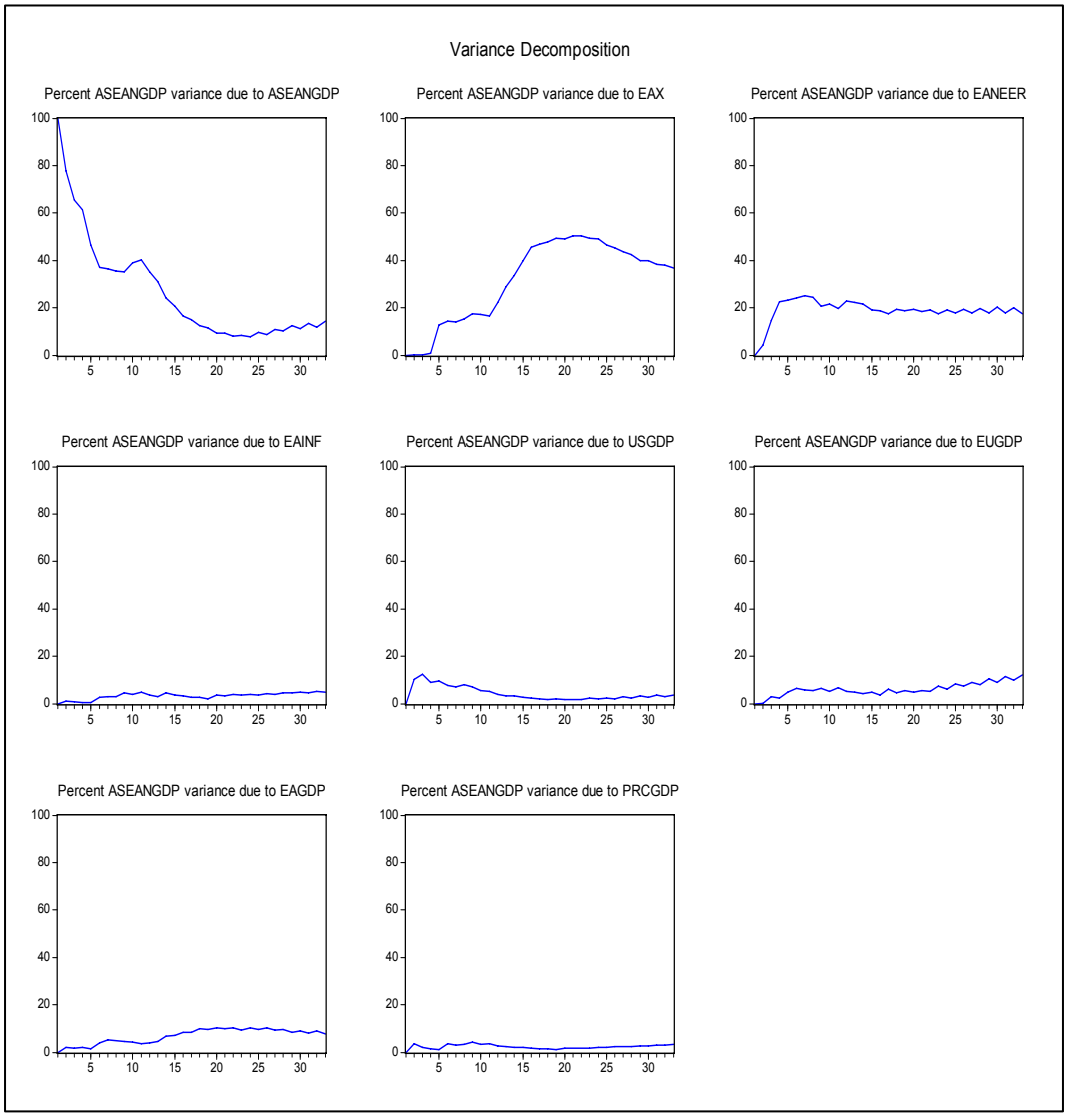
covariance matrix	
Portmanteau test	LB(15) = 1588.95 (df = 576, p-value 0.000000)
AIC	79.8256
BIC	93.5087
HQC	85.1778
Variable	**Coefficient**
const	-96470.2
aseangdp_1	0.926162**
aseangdp_2	0.221490
aseangdp_3	-0.0188127
aseangdp_4	-0.486489
aseangdp_5	0.573996
aseangdp_6	0.0184286
eax_1	-0.0217988
eax_2	-0.0351846
eax_3	0.172695
eax_4	0.139294
eax_5	-0.439260**
eax_6	0.244540
eaneer_1	391.367
eaneer_2	236.856
eaneer_3	575.455
eaneer_4	-419.798
eaneer_5	23.6792
eaneer_6	-432.307
eainf_1	-76.1328
eainf_2	-748.071
eainf_3	-199.232
eainf_4	-127.336
eainf_5	249.149
eainf_6	-78.8385
usgdp_1	-30.7271
usgdp_2	25.8818
usgdp_3	-5.59305
usgdp_4	-6.62571
usgdp_5	-49.3844
usgdp_6	42.9617
eugdp_1	-332.649*
eugdp _2	96.8143
eugdp _3	209.367*
eugdp _4	-199.724
eugdp _5	635.927**
eugdp _6	-124.634
eagdp_1	3.48715
eagdp _2	-2.65613
eagdp _3	0.118695
eagdp _4	-3.34682
eagdp _5	-0.106565
eagdp _6	4.69631
prcgdp_1	-54.9066*
prcgdp_2	-11.9488
prcgdp_3	1.72625

prcgdp_4	19.3027
prcgdp_5	81.0838*
prcgdp_6	12.1573

It can be seen from the results *EUGDP*, *PRCGDP*, *ASEANGDP*, and *EAX* are significant in influencing *ASEANGDP* at their respective lags.

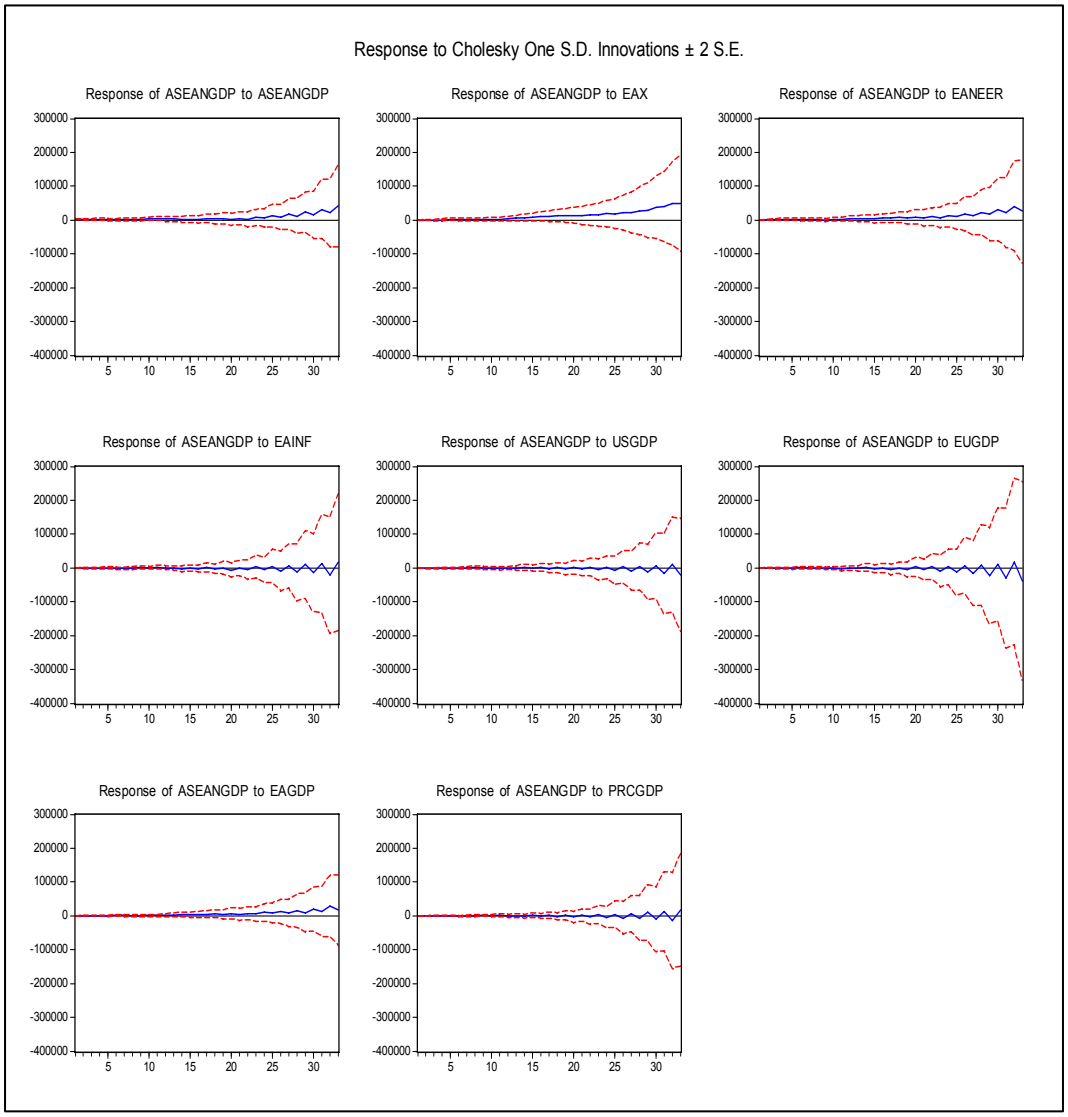
4.5.2 Variance Decomposition

Most of the *ASEANGDP* variations are accounted mostly by domestic variables namely EAX and EANEER. The GDPs of major trading partners of ASEAN have relatively the same variations to ASEANGDP over the 33-quarter period.



4.5.3 Impulse Responses

Results show that the shocks in *ASEANGDP* due to domestic variables are significant at initial periods. The GDPs of major trading partners of ASEAN also contribute significant shocks to ASEANGDP at initial periods.



4.6 $ASEANGDP_t = f(EAGDP_t, EAX_t, EANINF_t, EANEER_t, USM_t, EUM_t, PRCM_t)$

4.6.1 VAR Estimation Results

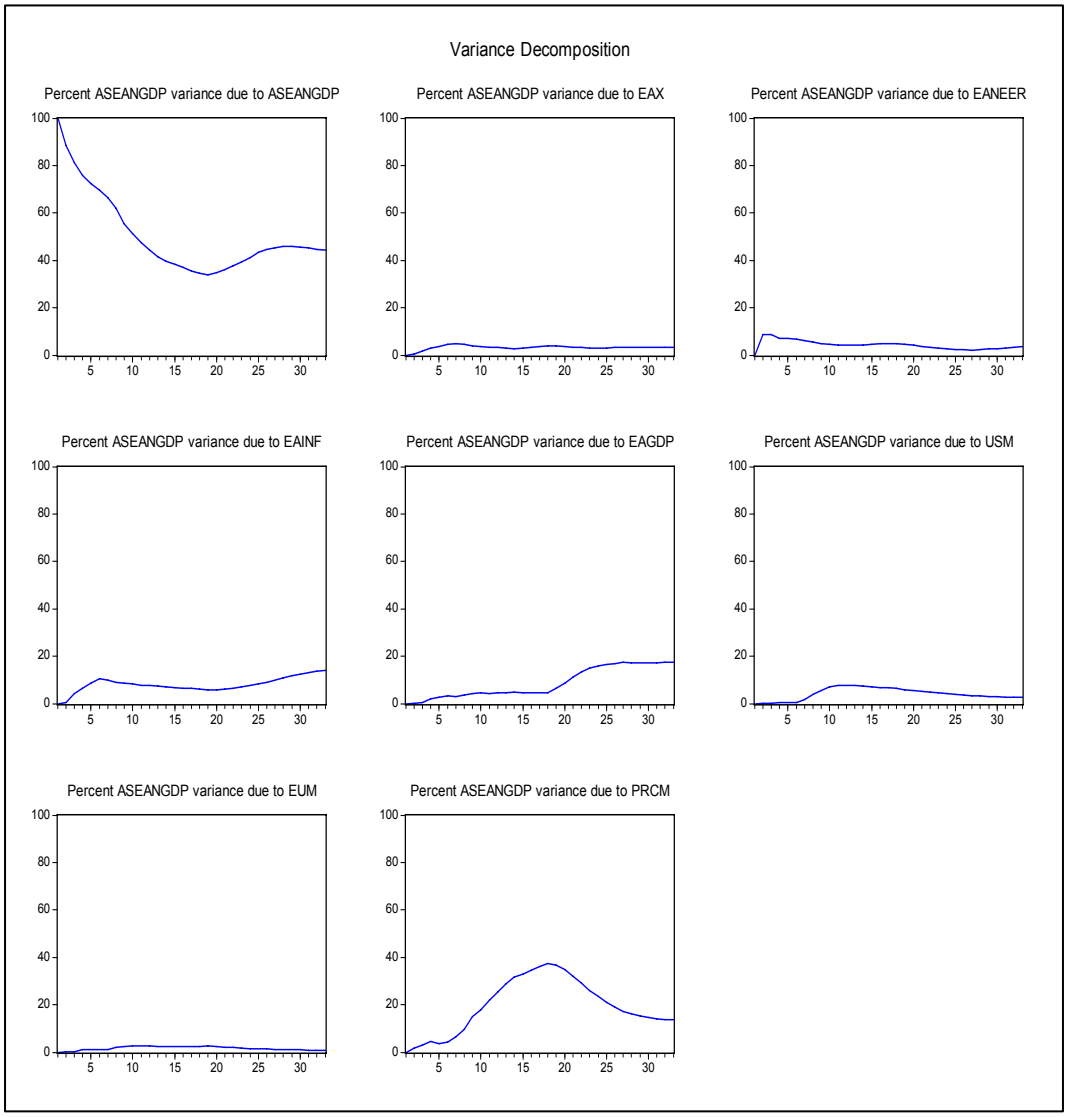
VAR system, lag order 5 Equation: aseangdp	
observations 1993:1-2008:1 (T = 61)	
Log-likelihood	-3795.592
Determinant of covariance matrix	1.5355326e+044
Portmanteau test	LB(15) = 1153.74

	(df = 640, p-value 0.000000)
AIC	135.1997
BIC	146.5500
HQC	139.6480
Variable	**Coefficient**
const	27083.6
aseangdp_1	0.510063**
aseangdp_2	0.0918427
aseangdp_3	0.00703296
aseangdp_4	-0.104539
aseangdp_5	-0.148142
eax_1	-0.0376606
eax_2	-0.0320544
eax_3	0.0138149
eax_4	0.199900*
eax_5	-0.0688440
eaneer_1	-607.636
eaneer_2	313.585
eaneer_3	-24.6013
eaneer_4	57.2051
eaneer_5	248.870
eainf_1	-333.771
eainf_2	-469.765
eainf_3	-155.528
eainf_4	39.8879
eainf_5	-306.870
eagdp_1	3.19849
eagdp_2	2.00701
eagdp_3	0.0384067
eagdp_4	-3.57499
eagdp_5	-2.01523
usm_1	0.0804714
usm_2	0.00594459
usm_3	-0.0178217
usm_4	-0.246290
usm_5	0.0723517
eum_1	-1.44284E-05
eum_2	2.69782E-05
eum_3	3.22570E-05
eum_4	-4.90985E-05
eum_5	-9.30749E-05
prcm_1	0.118679
prcm_2	0.0994085
prcm_3	0.0458088
prcm_4	-0.0420199
prcm_5	0.0645003

From Equation 1, it can be seen from the results ASEANGDP and EAX are significant in influencing *ASEANGDP* at the first lag.

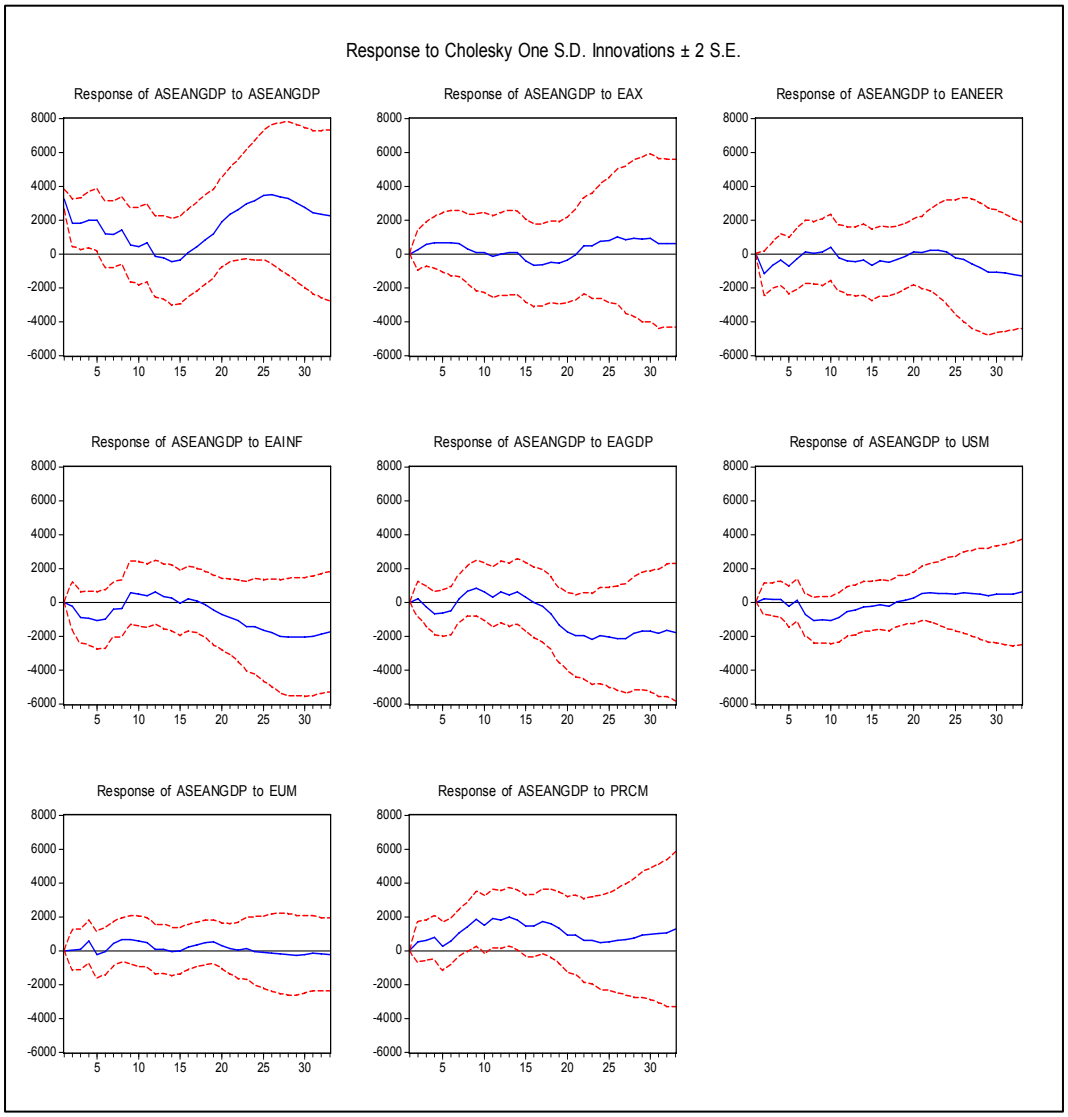
4.6.2 Variance Decomposition

Most of the *ASEANGDP* variations are accounted mostly by *PRCM, EAGDP,* and ASEANGDP while other variables have a relatively fair share of explanatory powers on the variations in ASEANGDP over the 33-quarter period.



4.6.5 Impulse Responses

Results show that the significant shocks in *ASEANGDP* are coming *ASEANGDP* itself while the shocks coming from other variables are insignificant.



4.7 $PRCGDP_t = f(USGDP_t, USM_t, EUGDP_t, EUM_t, EAGDP_t, PRCGDP_t, ASEANGDP_t)$

4.7.1 VAR Estimation Results

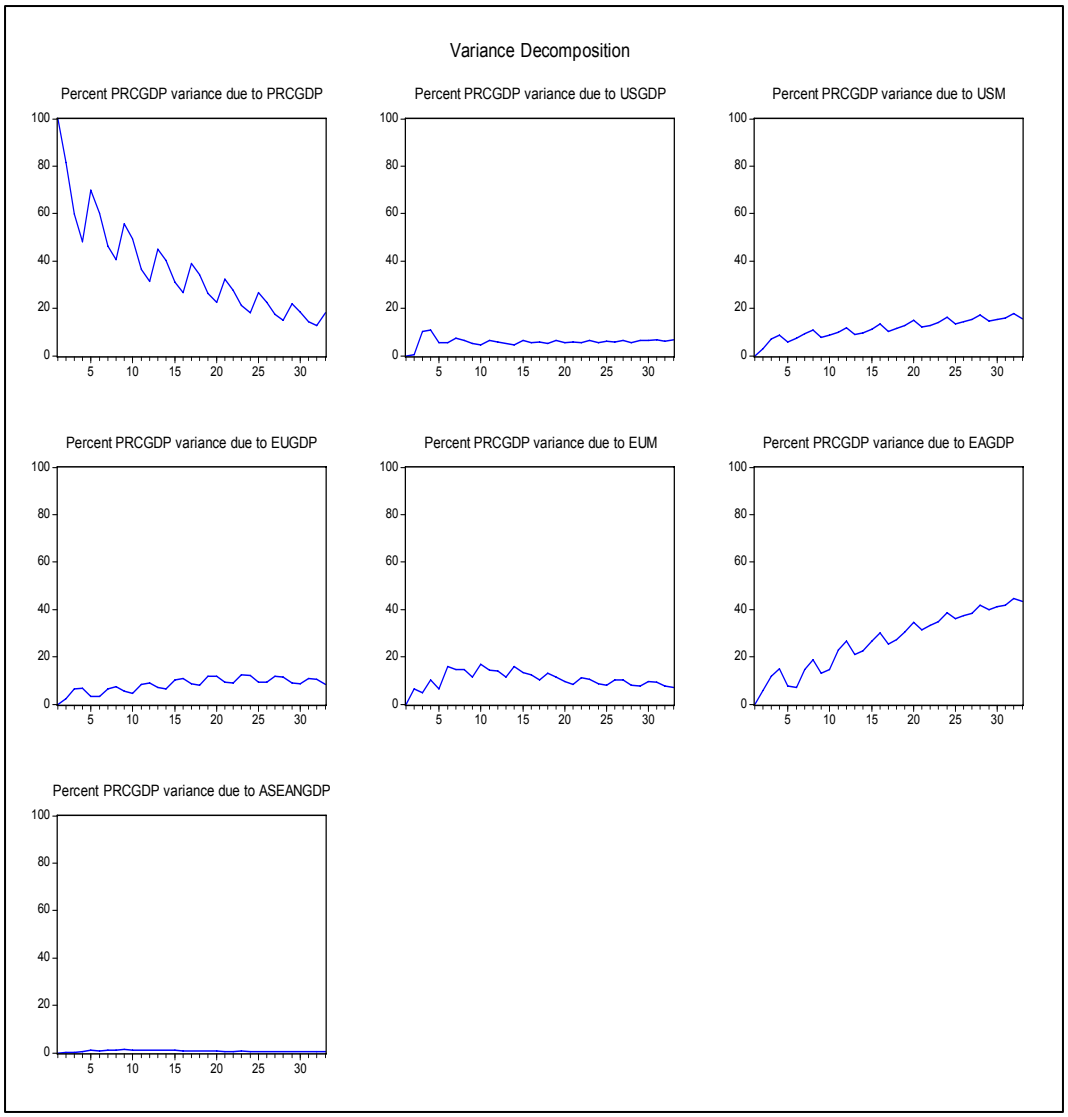
VAR system, lag order 6 Equation: prcgdp	
observations 1993:4-2008:1 (T = 58)	
Log-likelihood	-3037.8711
Determinant of covariance matrix	2.2406205e+035
Portmanteau test	LB(15) = 964.93

	(df = 441, p-value 0.000000)
AIC	111.2957
BIC	121.8023
HQC	115.4054
Variable	**Coefficient**
const	-3547.87***
prcgdp_1	-0.436055*
prcgdp _2	-0.473772*
prcgdp _3	-0.276653**
prcgdp _4	1.18082***
prcgdp _5	0.421610
prcgdp _6	0.368966
usgdp_1	0.0578273
usgdp_2	-0.624032**
usgdp_3	-0.336240
usgdp_4	-0.0559497
usgdp_5	0.435677*
usgdp_6	-0.279894
usm_1	0.000700767
usm_2	0.000756116
usm_3	0.00344113*
usm_4	-0.00174423
usm_5	0.00271770
usm_6	-0.00172135
eugdp_1	-0.0642071
eugdp_2	3.53644**
eugdp_3	5.20192***
eugdp_4	3.55652**
eugdp_5	1.09436
eugdp_6	-1.32131
eum_1	1.41016E-06
eum_2	-8.09232E-07
eum_3	-2.91633E-06*
eum_4	1.25406E-06
eum_5	2.29392E-06
eum_6	2.40810E-06
eagdp_1	0.0340431
eagdp_2	0.0323568
eagdp_3	0.0271056
eagdp_4	-0.0891658**
eagdp_5	-0.0743989*
eagdp_6	-0.0239203
aseangdp_1	0.000646893
aseangdp_2	-0.000463961
aseangdp_3	0.00187768
aseangdp_4	0.00575170**
aseangdp_5	-0.00146967
aseangdp_6	0.00232660

It can be seen from the results that all variables as well as several lags are significant in influencing *PRCGDP*.

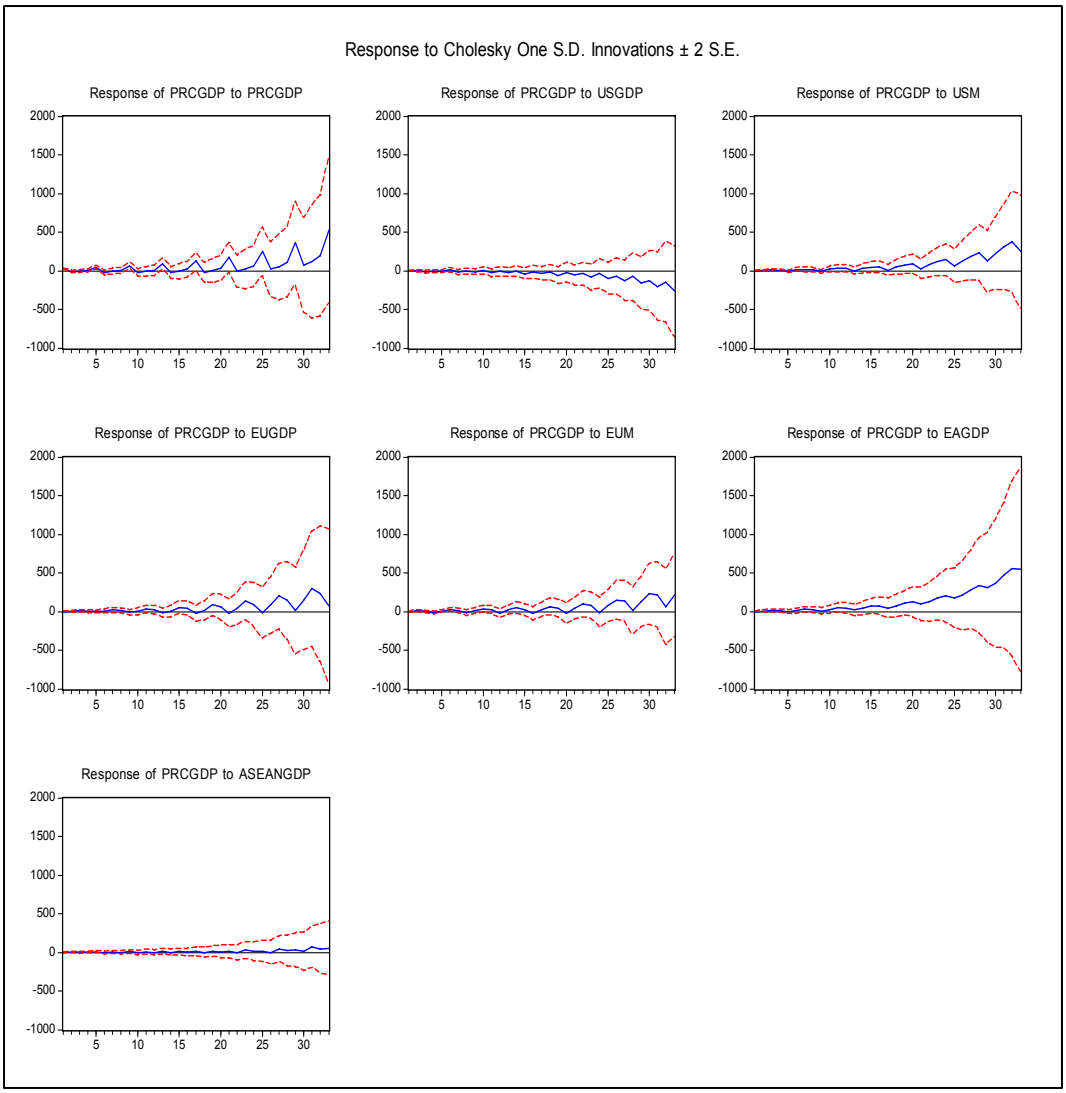
4.7.2 Variance Decomposition

Most of the *PRCGDP* variations are accounted mostly by *EAGDP* explaining more than 70 percent after the first quarter and more than 20 percent at eleven quarter horizon onwards. Comparatively, the disturbances in the *USGDP* and *EUGDP* have more explanatory power in accounting for variations in *PRCGDP* than *ASEANGDP*. On the other hand, *USM* have more explanatory power than *EUM*.



4.7.3 Impulse Responses

Results show that the shocks in *PRCGDP* caused by all variables of interest are significant at earlier periods and dissipate after 10 to 15 quarters. Indeed, the ASEAN, US, and EU markets cause disturbances to the Chinese economy at varying magnitude.



Overall, based from the results above and the results presented in the Appendix for Chapter 4, bulk of shocks are mostly coming from domestic sources. Moreover, the GDPs of countries and regions taken into consideration have an "instantaneous" shock. On the other hand, USGDP, USM as well as PRCGDP and PRCM are the most significant in influencing EAGDP, ASEANGDP, EAX, and ASEANX. Also, EUGDP, JAPGDP, KORGDP, EUM, JAPM, and KORM can also explain variations or fluctuations in EA variables, but US and PRC variables have more explanatory powers as seen from the Variance Decomposition and Cholesky Decomposition.

The impact of the variables from the EU shows weak contribution to shocks in East Asia and ASEAN. Also, the impacts of the variables from Japan are much stronger than Korea but PRC overpowers the shocks caused by Japan and Korea. Indeed, disturbances coming from major trading partners or from regions or countries in which East Asia and the ASEAN have significant relationship can be deemed to be the major source of economic fluctuations that regional cooperation will somewhat insulate ASEAN from further economic shocks. For the exports, EAINF and EANEER are significant in influencing EAX.

Furthermore, PRCGDP is significantly affected by the changes in the economic performance of its major trading partners namely US, EU, ASEAN, and EA itself where it belongs.

Chapter 5: Global Imbalances and Macroeconomic Adjustments: The Case of East Asia*

1 Introduction

Recent analyses and observations have suggested that the occurrence of major financial crises is a cyclical phenomenon that, barring major reforms in financial crisis prevention and management, will continue to be an inherent part of the global condition. Hence, there is a need to scrutinize the gravity of the impact of the 1997 Asian Financial Crisis (AFC) as well as the current global financial crisis on the economies in the East Asian region. Moreover, there is a need to explore the role of global financial imbalances and regulatory environment in bringing about regional and global financial crises. There is also a need to explore alternative avenues that can be pursued to mitigate the impact of the regional and global financial crises on the East Asian region as well as the need to develop and strengthen regional cooperative measures to mitigate the impact of regional and global financial crises on the economies in the region.

With these, it is imperative to identify and illustrate the two major causes of crises namely: major balance of payments issues in affected economies, and the ineffectiveness of the financial regulatory environment in controlling financial flows. The discussion will begin with an analysis of both financial crises, to be followed by an explanation of the driving forces behind these events. It will end with an exploration of possible solutions and the role of regional cooperation in mitigating such threats.

2 Global Financial Imbalances and the Financial Crisis

Financial crises, also known as banking or currency crisis, are situations wherein the international dimension worsens a crisis in ways that would not occur in a closed economy (Summers, 2000). Financial crises occur when recession happens. As the economy grows, profits are expected to increase as well. Consequently, firms tend to become optimistic in the profits that they would be able to generate. Most of these firms also engage in investing too much that they feel that the returns would be surely high. Loans deceive as the society believes that more loans would definitely mean that there are more Foreign Direct Investments (FDIs) and the economy grows further. However, the opposite is happening in reality. Lenders and investors expect that even if firms would have slight troubles, refinancing could be managed since the firm's profits are still rising. Hence, this is basically the start of crises. At some point in time, the credit would be too big and soon, firms will default and experience bankruptcy. It will have a continuous effect on other industries in the country as well as in the region it belongs to. Take for example the cases of the 1997 Asian Financial Crisis, The Latin American Crisis, and The Russian Crisis. According to Kaminsky and Reinhart (1998) and Krugman (1996), because money supply is critically low, refinancing is actually not very much feasible. Lenders start panicking and pull out their original investments. If no new supply of money comes in the economy to push for refinancing, then crisis is prevalent.

The effects of crises are not clearly seen in the long-run. According to Kaminsky and Reinhart (1996), it is the short run effects of a crisis that are experienced more. From a very high state in the international scene, countries and regions are now with Gross Domestic Product (GDP)

* A chapter prepared for the ASEAN project entitled "*The Trend of Trade, Foreign Direct Investment, and Monetary Flows in East Asia, and its Policy Implications*". Research assistance provided by John Paolo R. Rivera and Francis Dominic M. Laset is greatly appreciated.

growth rates that are lessening and becoming negative, single digit inflation rates double up, and unemployment rates become unusually high. There are also indicators showing that countries are already having crises and they themselves do not feel it yet. Increases on over lending of M2, the ratio of domestic credit to nominal GDP, the real interest rate on deposits and the ration of lending-to-deposit interest rates are usually the first short-run effects that theoretically indicate a crisis (Calvo, 1998 and Jacobs, Kuper, and Lestano, 2004). Other short run effects would include that exports and the terms of trade would decline quickly while imports and domestic currency get real appreciations. Losses on national reserves are increasing along with rises on the interest rate differentials. Current and capital accounts suffer while national output and stock prices significantly decline (Kaminsky and Reinhart, 1998).

Long run implications are not clearly recognized because the country just returns to its original or initial status before the crisis. However, the country's currency is now of lesser value compared to others (Kaminsky and Reinhart, 1998). Also, it does not necessarily follow that projects during the financial crisis will be pursued. Moreover, the country will slowly regain its domestic confidence but with a lot more precautionary policies regarding crises. Hence, there is really is no clear effects in the long run for the crises are considered as a cycle (Jacobs, Kuper, and Lestano, 2004). Thus, after some period, it will just repeat as is.

There are a lot of solutions and preventions for the onslaught of financial crises. According to Summers (2000), one would be by maintaining a strong domestic financial system by making them effective and efficient and by enforcing effective corporate governance that can avoid bankruptcy. More importantly, significant amount of debt must be sustainable because if financial systems are flawed, even small amount of debt will be detrimental. Second, an appropriate exchange rate regime must prevail. Economies with access to international capital markets must have the means to move away from the middle ground of pegged but adjustable fixed exchange rates toward the two corner regimes of either flexible exchange rates or a fixed exchange rate (Summers, 2000). Third, sound and stable macroeconomics policy environment must be situated in the country with an aim of lessening the incidences of fiscal deficits that the country cannot meet. As a result, the country will be capable of replenishing these debts. Lastly, countries should avoid liquidity risks and balance sheet risks. Foreign reserves are important because they are used to pay off bad debts and they are the ones needed for properly measured and planned long term capital investments (Summers, 2000).

Demetriades and Fattouh (1999) saw financial liberalization as a solution to financial crisis. It means that some banks can opt to merge in order to become more efficient while implementing realistic exchange policies. Likewise, Sahagun and Mosio (1989) recommended that affected countries can consider temporarily returning back to being a closed economy again in order to rebuild its system. However, if all else fails, Sahagun and Mosio (1989) recommended that the affected country can promote its "positives" by having a strong encouraging power to avail of FDIs again by easing the laws and taxes with potential investors. The government must also plan on having free trade zones, and specialize on "globalized" facilities such as power plants and research centers. Likewise, if the International Monetary Fund (IMF) and other countries owed are compassionate, debt forgiveness can be implemented that will signal the beginning of a new period for the affected country. Domestic confidence will be regained as well as democratic diversification for social participation would be optimized.

2.1 Major Causes of the Financial Crisis

2.1.1 Balance of Payments Imbalances

2.1.1.1 The 1997 Asian Financial Crisis

East Asia had a long track record of economic success in the 1990s and it has been deemed that there has been something in Asia's growth strategy then that inevitably led to the financial crash. Between 1965 and 1995, average income of Malaysia, Indonesia, and Thailand more than quadrupled. In Korea, income increased more than seven times. Also, average incomes in these countries climbed from 10 percent of the US average in 1965 to around 27 percent in the 1990s. Moreover, life expectancy increased from 57 years in 1970 to 68 years in 1995 and adult literacy rate jumped from 73 percent to 91 percent. Incomes of the poorest quintile of the population grew just as fast as average incomes, and poverty rates fell substantially in each East Asian country. In Indonesia, the share of the population living under the poverty line fell from 60 percent in the 1960s to under 15 percent in 1996 (Radelet and Sachs, 1998). Thus, it is notable that the benefits of economic growth were widely shared throughout the population. Despite the continuing and rapid economic growth in the 1990s, certain imbalances and weaknesses in the East Asian economies both at the microeconomic and macroeconomic levels contributed to the buildup of the crisis.

The rapid buildup of short term external debt into weak financial systems; made possible both because of East Asia's successful track record which attracted foreign credits and because of partial financial market liberalization in East Asia, opened new channels for foreign capital to enter into the Asian economies. Such capital inflows resulted to the appreciation of real exchange rates, rapid expansion of bank lending, and an increase of vulnerability to a reversal in capital flows. When capital inflows waned in 1996 and 1997, a financial panic erupted following a series of inappropriate decisions made by the Asian governments, the IMF, and the international community. The result was a much deeper crisis than was either necessary or inevitable (Radelet and Sachs, 1998).

Several aspects of the buildup to the crisis are worth stressing. First, capital inflows to East Asia averaged over 6 percent of GDP between 1990 and 1996. Capital inflows to Thailand averaged over 10 percent of GDP in 1995, which were predominately borrowings by banks and financial institutions. In Malaysia, inflows averaged 9 percent of GDP and increased to over 15 percent in 1992 and 1993 before tapering off. However, the bulk of Malaysia's inflows came in as FDI, which is less prone to reversals. In Indonesia, inflows averaged a more modest 4 percent of GDP, mostly in the form of borrowing by private corporations.

Second, governments maintained their respective exchange rates either with very little variation (Malaysia, Thailand, and Philippines) or small, predictable changes (Indonesia and Korea). In effect, the central banks absorbed the risks of exchange rate movements on behalf of investors, which helped encourage capital inflows, especially with short maturity structures.

Third, exchange rates appreciated in real terms as the capital inflows put upward pressure in non-tradable prices. Real exchange rates appreciated by more than 25 percent in the four Southeast Asian countries between 1990 and early 1997. In Korea, the appreciation was about 12 percent.

Fourth, export growth began to slow down in 1996 and then dropped sharply in each country, except in the Philippines. In Thailand, exports actually fell in nominal dollar terms in 1996, while

in Korea, exports increases just 3.7 percent. Several factors probably contributed this namely the increasing overvaluation of the exchange rates; the appreciation of the Chinese Yuan; the competitive effects of Mexico's participation in the North American Free Trade Area (NAFTA) and its peso devaluation; and the global surplus in semi-conductor production.

Fifth, domestic bank lending expanded rapidly throughout the region. In Thailand, Korea, and Malaysia, banking claims on the private sector increased by more than 50 percent relative to GDP in seven years, reaching 140 percent of GDP in 1996. The Philippines, starting at a much lower base, recorded private credit growth of over 40 percent per year between 1993 and 1996. Only in Indonesia did credit growth remain at more modest levels. Much of the new lending was financed by the banks borrowing offshore. In Korea, foreign liabilities of the banking system more than doubled from 4.5 percent of GDP in 1993 to 9.5 percent of GDP in mid 1997. In the Philippines, these liabilities increased from 8.8 percent of GDP at the end of 1995 to an astonishing 21 percent of GDP in mid 1997. Apparently, a modestly increasing share of domestic bank lending was used for real estate, property, and purchases of equity funds.

Sixth, an increasing share of foreign borrowing was short term debt, especially in Korea, Thailand, and Indonesia. Short term debts to offshore banks in these three countries reached $68 billion, $46 billion, and $34 billion respectively at the end of 1996. In Thailand, Korea, and Indonesia, the hardest hit by the crisis, the ratio of short term debt to foreign exchange reserves exceeded one after 1994. A ratio greater than this is not by itself sufficient to spark a crisis since it can be sustained as long as foreign creditors are willing to roll over their loans. However, a high ratio does not indicate vulnerability to a crisis. Once something sparks a withdrawal of foreign capital, each foreign creditor has the incentive to demand repayment quickly since they know that there is not enough foreign exchange available to repay everyone.

It is worth highlighting that all these imbalances were centered in the private sector and not on the government. Throughout the early 1990s, governments kept their budgets in surplus positions, maintained overall money growth at prudent levels, and kept inflation rates below 10 percent. In each country, government debt actually declined during the 1990s.

Capital withdrawal and panic can be blamed for the spark of the AFC. Pressure began to mount in 1997 in Korea and Thailand. In Korea, *Hanbo Steel* declared bankruptcy leaving $6 billion in debts. Likewise, *Sammi Steel* and *Kia Motors* faced similar difficulties. These problems put increasing pressures on merchant banks. In Thailand, property prices fell in late and a major property developer, *Somprasong Land*, was unable to meet a foreign debt payment. Such instances provided the first clear indication that financing companies heavily exposed to the Bangkok property market were in trouble. The Baht came under attack in late 1996, and twice more in the early months of 1997. The Thai government promised to buy $3.9 billion in bad property debt from finance companies but then quickly reneged on its promise. As evidence grew of the fragile condition of the property sector and the financial institutions, speculation mounted that foreign exchange reserves were dwindling and that the government would have to float the Baht. The government sharply reduced its liquid foreign exchange reserves and the Baht was cut loose.

Foreign creditors reacted by withdrawing capital from around the region and exchange rates came under intense pressure. Currencies in the each of the four Southeast Asian countries had fallen by 20 percent or more. As the currencies fell and capital flows reversed, several forces came into play to create a self-reinforcing spiral that quickly evolved into a panic. In the early stages, creditors made little effort to distinguish amongst the Southeast Asian countries and assumed that if Thailand was in trouble, the other countries could not be too far behind. As

exchange rates depreciated and the domestic currency costs of servicing foreign debts increased, foreign creditors became more reluctant to extend new loans and roll over existing loans. Domestic debtors had to buy foreign exchange to retire these debts that placed greater pressure on exchange rates that reinforced the tendency for creditors to not roll over loans. Domestic debtors, many of which had not hedged their foreign exchange exposure, began to purchase foreign exchange to try to close their positions. The major ratings agencies belatedly began to downgrade countries in the region triggering further creditor withdrawals. Also, both governments in the region and the international community made several mistakes in handling the crisis that added fuel to the fire. For instance, Malaysian Prime Minister Mahathir's harsh comments about foreign investors and his threats to ban foreign currency trading are prime examples. Malaysia announced it would establish a fund to support stock prices, then abandoned the plan a few days later. Korea seemed to be boldly facing some of its problems by allowing some of the *chaebol* to go bankrupt but it inexplicably spent down its reserves in a desperate attempt to defend the Won. Ironically, Indonesia was at first widely praised for its handling of the crisis, as it first widened the trading band on the Rupee and then floated the currency. It resisted the temptation to spend reserves, eased the rules governing foreign ownership of stocks, and announced that it would postpone over 100 investment projects. However, it retracted that decision for several large projects, and then later postponed them again. Furthermore, as international confidence in these strategies waned and it became clear that the economic contractions in the region would be much larger than originally thought, creditors withdrew even more funds, intensifying the panic.

If Thailand reacted differently to the fall in property and stock prices and the growing fragility of the financial institutions in 1996 and 1997, the crisis and the contagion effect could have both been avoided. Despite the fall in property prices, the warnings of investment analysts, and the large infusions of money to ailing banking institutions, the Thai government staunchly maintained the exchange rate peg of the baht to the $, thereby leading to a massive loss of reserves. By the time the currency was allowed to float, the government had already spent a considerable amount of foreign exchange reserves in defense of the currency and has committed large amounts of foreign exchange to forward purchases of Baht, as well as billions of dollars in Baht propping up failed banking institutions without taking fundamental steps towards their closure, merger or rehabilitation. All these factors resulted in Thailand's extremely vulnerable tendency for investor panic.

One of the most important characteristics of the AFC was that a large number of Asian corporations became insolvent literally overnight. In fact, almost every country has experienced a substantial net wealth loss. It must be noted that before the occurrence of the crisis, almost these economies were reaping economic profits. Therefore, Sebastian (1999) stated the following steps which must be addressed, or else these factors could pose serious effects to their economy. It would be ideal for East Asian nations to implement a scheme that would allow simultaneously for corporate restructuring particularly on corporate recapitalization; extinction of dollar denominated debts issued by Indonesian entities; and increase in foreign direct investment.

2.1.1.2 The 2008 Global Financial Crisis

The rapid expansion of the economy together with the liberalization measures in trade and investment policies enabled several economies in the region experienced significant expansion in merchandise trade over the last three decades. As a consequence of this, phenomenal growth in trade many economies in East Asia build up trade surpluses with the leading economic blocs in the world. In 1991, the region as a whole exhibited a trade surplus with the

United States as shown in Table 5.1. The region's trade surplus with the United States came primarily from Japan, South Korea, China, and Singapore with Japan accounting for $47.67 billion and China with $14.01 billion of the region's trade surplus with the United States.

Table 5.1: Share of East Asian Exports/Imports to/from the United States Selected Countries, 1991

Country	Exports		Imports	
	Percent of Exports	Amount of Exports ($ Billion)	Percent of Imports	Amount of Imports ($ Billion)
Japan	55.1	95.76	48.7	48.12
South Korea	10.2	17.73	15.7	15.51
China	11.7	20.33	6.4	6.32
Singapore	5.9	10.25	8.9	8.79
Total East Asian Exports	$173.8 Billion		$98.8 Billion	

Source: United Nations Comtrade Database

The expansion of trade in East Asia continued in recent years and the trade surplus with the United States persisted and stretched further. However, in more recent years China emerged as the leading trade partner of the United States in East Asia accounting for 48.5 percent of the total US imports from the region and 24.8 percent of the US exports to the region in 2006 as shown in Table 5.2. Consequently, China has replaced Japan as the East Asian economy with the largest balance of trade surplus with the United States. China's trade surplus with the United States in 2006 was registered at $249.18 billion while Japan has only $92.26 billion.

Table 5.2: Share of East Asian Exports/Imports to/from the United States Selected Countries, 2006

Country	Exports		Imports	
	Percent of Exports	Amount of Exports ($ Billion)	Percent of Imports	Amount of Imports ($ Billion)
Japan	24.2	151.86	26.8	59.60
South Korea	7.6	47.69	14.6	32.47
China	48.5	304.34	24.8	55.16
Singapore	2.9	18.20	11.1	24.69
Total East Asian Exports	$627.5 Billion		$222.4 Billion	

Source: United Nations Comtrade Database

The region's expansion of trade was likewise seen in the European market. In 2000, the East Asian region registered a balance of trade surplus with the European Union (EU) amounting to $120 billion as can be inferred from Table 5.3. Although Japan has greater share than China of the European trade in 2000, its trade surplus with EU amounting to $42.96 billion was smaller compared with China's $44.95 billion trade surplus. South Korea and Singapore also exhibited trade surpluses with the European region; however, although they are significant but not in the same magnitude as the amounts achieved by China and Japan.

Table 5.3: Share of East Asian Exports/Imports to/from the European Union Selected Countries, 2000

Country	Exports		Imports	
	Percent of Exports	Amount of Exports ($ Billion)	Percent of Imports	Amount of Imports ($ Billion)
Japan	32.8	84.82	30.2	41.86
South Korea	9.6	24.83	11.1	15.38
China	26.6	68.79	17.2	23.84
Singapore	6.2	16.03	10.5	14.55
Total East Asian Exports	$258.6 Billion		$138.6 Billion	

Source: United Nations Comtrade Database

In 2006 as can be seen in Table 5.4, China has overtaken Japan as the leading East Asian trade partner of the EU. China registered $164.41 billion trade surplus with the EU representing almost 65 percent of the total trade surplus of the East Asian region with the EU. Japan, on the other hand, has registered $40.61 billion while South Korea has $22.59 billion in trade surplus with the European market. The trade of Singapore with Europe is almost balance.

From these statistics we have shown that over time and across the two major trading blocs in the world, East Asia has generated balance of trade surplus with an increasing and significant magnitude made by China. Aside from the change, what is apparent in the data is that these countries have exhibited huge balance of trade surplus that have persisted over several years. As a consequence of these lingering balance of trade surpluses over the years, the several economies in the East Asian region have BOP surpluses.

Table 4.4: Share of East Asian Exports/Imports to/from the European Union Selected Countries, 2006

Country	Exports		Imports	
	Percent of Exports	Amount of Imports ($ Billion)	Percent of Imports	Amount of Imports ($ Billion)
Japan	19.1	96.89	22.2	56.28
South Korea	10.1	51.24	11.3	28.65
China	48.2	244.52	31.6	80.11
Singapore	4.8	24.35	9.6	24.34
Total East Asian Exports	$507.3 Billion		$253.5 Billion	

Source: United Nations Comtrade Database

The trend shown in Table 5.5 is consistent with the temporal as well as geographical variations in the balance of trade of the region. Although Japan has a higher BOP surplus registered in 2003 with $187 billion, it was overtaken by China in 2007 when it recorded $461 billion compared with $36 billion registered by Japan. Over the years, the United States and the European area have experienced BOP deficit although EU registered BOP surpluses in 2006 and 2007. The United States also recorded a BOP surplus in 2007. However, compared with the surpluses generated by smaller economies of Malaysia and Singapore these BOP surpluses of the US and European area are relatively small.

Table 5.5: Balance of Payment (BOP), 2003–2007

($ Million)

Country	2003	2004	2005	2006	2007
United States	-1,529.00	-2,804.00	-14,100.00	-2,392.00	125.00
European Area	-32,802.00	-15,560.00	-22,912.00	2,562.00	5,956.00
China	116,586.00	206,153.00	207,342.00	246,855.00	461,691.00
Japan	187,150.00	160,850.00	22,330.00	31,980.00	36,520.00
Singapore	6,703.28	12,193.00	12,314.70	17,007.50	19,640.10
South Korea	25,791.100	38,675.000	19,864.000	22,090.10	15,109.10
Malaysia	10,180.600	22,050.000	3,619.610	6,863.78	13,143.70

Source: International Financial Statistics (IFS)

The trade surpluses can be accommodated by changes in the capital account through increase outflows of capital including foreign direct investments and portfolio flows. However, from the data in Table 5.6, in 1997 South Korea, Taiwan and Hong Kong are the only economies in East Asia that recorded net capital outflows expressed in terms of foreign direct investments while Singapore, China, and the ASEAN–4 have net capital inflows. As a consequence, the BOP surpluses generated by the trade surpluses made by several economies in East Asia with the United States and Europe were further by the net inflows of capital particularly made in China.

In 2005, only Taiwan has remained a net capital exporter and the rest of the region has become a net importer of capital. Thus, instead of reducing the balance of trade surpluses, this import of capital expanded the magnitude of the BOP surpluses of the economies in the region.

Table 5.6: Foreign Direct Investments of Selected East Asian Countries, 1997 and 2005

($ Billion)

Country/Year	1997		2005	
	Inflows	Outflows	Inflows	Outflows
South Korea	2.64	4.45	7.20	4.31
Singapore	13.75	10.90	20.08	5.52
Taiwan	2.25	5.24	1.63	6.03
China	45.26	2.56	72.41	11.31
Hong Kong	11.37	24.41	35.90	32.56
ASEAN-4	16.3	3.57	14.05	6.44

Source: UNCTAD / TNC Database as cited in Hakkari and Rajan (2008)

In terms of portfolio flows sent into the economies by various regional blocs shown in Table 5.7 and Table 5.8, the United States flowed in portfolio assets into China, South Korea, and Singapore. In 2006, the United States invested funds into China, South Korea, Singapore, and Hong Kong. These inflows of private funds into the region coming from the United States further reinforced the persistence of BOP surpluses of these economies over the years.

Figure 5.7: Net Portfolio Assets Sent By Major Regions, 1997

($ Million)

Country	East Asia	Japan	United States	Total
China	-	1,485.19	5,394	-
South Korea	-2,806.12	7,987.66	13,129.75	19,163.56
Singapore	-6,091.40	922.91	5,924.11	-1,335.35
Hong Kong	-	-	-	-

Source: International Monetary Fund (IMF)

Figure 5.8: Net Portfolio Assets Sent By Major Regions, 2006

($ Million)

Country	East Asia	Japan	United States	Total
China	-	-14,412.81	75,314.00	-
South Korea	22,947.73	6,496.22	93,465.61	197,004.27
Singapore	-59,259.68	994.89	15,643.15	-118,495.18
Hong Kong	-106,740.12	7,120.52	22,650.00	-358,805.91

Source: International Monetary Fund (IMF)

Given the rapid expansion of merchandise exports of East Asian economies with the two major economic blocs in the world and the continuing balance of trade surpluses generated with these trading partners, a lingering balance of payment surpluses became the backdrop of the external position of these economies over decades. Instead of reducing huge balance of trade surpluses, the inflows of foreign direct investments and private portfolio further expanded the BOP surpluses of these East Asian economies. Because of the limitation in capital account outflows, the adjustment in the external position has to be done through the accumulation of reserves. In Table 5.9 we can see that in 2007, China has over $1.5 trillion in reserves. These huge reserves of surplus economies in the East Asia significantly financed the easy credit initiatives of US and European financial institutions that lead to the current financial crisis. Thus, the economic dynamism in the East Asian region has a significant influence in the emergence of the current global financial crisis as contributes significantly in the global financial imbalances.

Table 5.9: International Reserves, 2003–2007

($ Million)

Country	2003	2004	2005	2006	2007
United States	74,894.10	75,890.00	54,083.80	54,853.90	59,524.30
European Area	223,145.00	211,971.00	184,714.00	197,006.00	215,557.00
China	408,151.00	614,500.00	821,514.00	1,068,490.00	1,530,280.00
Japan	663,289.00	833,891.00	834,275.00	879,682.00	952,784.00
Singapore	96,245.50	112,579.00	116,172.00	136,260.00	162,957.00
South Korea	155,284.00	198,997.00	210,317.00	238,882.00	262,150.00
Malaysia	10,180.60	22,050.00	3,619.61	6,863.78	13,143.70

Source: International Financial Statistics (IFS)

Radelet and Sachs (1998) cited the liberalization of global capital markets in the 1990s as the origin of the eventual Asian Crisis. Such an opening up of financial horizons, coupled with decreasing interest rates in both Japan and the United States, resulted in huge amount of foreign capital flowing into the recently developed countries of the East Asian region. In line with such massive inflows, current account deficits in the receiving countries began to rise from an average of around 0.3 percent in 1985 to 1989 to 4 percent in 1990 to 1996. In the period leading up to the crisis, Asian economies had been pursuing managed or pegged exchange

rates, which gave investors a greater sense of security, and encouraged low-interest foreign borrowing, coupled with high-interest domestic lending.

Joosten (2004) deemed that these policies were far more dangerous than initially apparent, not only because pegged exchange rates increased the risk of reduced competitiveness, brought on by possible fluctuations in foreign currency values, but also because these booming domestic lending markets suffered from a severe lack of oversight. Present regulation and supervision measures could not keep up with the rapid flow of money, and these huge inflows ended up fueling the asset price bubbles that would eventually burst, triggering the crisis. The placement of these loans into the non-tradable sector specifically real estate, instead of foreign currency-earning exportables left the involved countries in an even more precarious position (Radelet and Sachs, 1998). The real estate price bubble burst soon after, causing defaults on loans, and leaving banks unable to recover lost loans by selling collateral given that most of the assets offered for collateral were themselves real estate. This exposed banks to huge losses and eventual bankruptcy and triggered massive private capital pullouts from foreign investors. Chan-Lau and Chen (1998) observed the dramatic speed and magnitude of the pullout; the affected region went from having $93 billion worth of inflows in 1996, to $12 billion in outflows in 1997. Because of a lack of reserves, the economies hit by this exodus of funds suffered a severe depreciation of their respective currencies. According to the Asian Development Bank (ADB), a rare exception was China as its huge BOP reserves enabled it to withstand such an attack on regional currencies. It can be noted that China has never experienced a deficit in its BOP since 1992 and that its reserves have been rapidly growing from $143,363 million during 1997 to $1,534,354 in 2007.

Cohen and Remolona (2008) stated that “the truth, however is that the underlying causes of the turmoil are in many ways familiar.” They explained that like the 1997 AFC, the current crisis rose out of a “long period of unusually easy macroeconomic conditions,” with low interest rates, and a buildup of large amounts of savings, this time in the emerging economies of Asia and the Middle East. Like the 1997 AFC, the Global Financial Crisis began when large amounts of money from strong economies were let loose into financial markets. As before, this resulted in an increase in lending, backed up by increasing risk-tolerance caused by ever-rising asset prices and the promise of possible speculative gains. Cohen and Remolona (2008) explained that the bubble generated by such conditions burst, causing investors to rush to pull out their capital, after banks were subjected to a rash of defaulted loans. Moreover, the current crisis is not solely a re-hash of previous events: a number of new financial innovations have entered the playing field, in the form of collateralized debt obligations (CDOs), credit default swaps (CDSs), and other instances of structured credit.

Aglietta (2008) deemed that the complex new financial model of structured credit has received much of the blame for the current crisis. Furthermore, the structured credit system uses a process called securitization to transform loans into financial securities. In this process, loans are first pooled together by investment banks, who purchase them from the original issuers, then load them onto special purpose vehicles (SPVs), to be sold off to investors and banks. These loans are divided into tranches and sold accordingly based on the level of risk that the loans involve. Aglietta (2008) also mentioned that professionals may prefer to break down such loans further into smaller and more spread-out sets. Such a process makes the true sources of loans and their related risk more and more difficult to understand as Cohen and Remolona (2008) mentioned that “the sheer scale and variety of the use of these innovations outstripped

the capacity of even the most sophisticated dealers and investors to understand and manage the risks associated with them."

From the discussion above, it is quite clear that massive balance of payments fluctuations have been at the heart of both financial crises, serving as both cause and eventual effect. As mentioned by both Radelet and Sachs (1998) and Cohen and Remolona (2008), both crises began with a large buildup of savings, or balance of payments surpluses, in strong economies. These surpluses were soon invested en masse into other countries, setting off the eventual crises. By the end, affected economies are left with severe balance of payments deficits, after foreign investors have all pulled out their capital.

As far as the Asian crisis is concerned, BOP problems were exacerbated by the implementation of managed exchange rates by the affected economies. According to Sachs and Woo (1999), the presence of pegged exchange rates made balance of payments deficits even more severe, because they forced governments to expend large amounts of reserves to protect their fixed exchange rates from depreciation.

2.1.2 Regulatory Environment on the Financial Flow

A weak regulatory environment for financial flows has also been blamed for the 1997 and the 2008 financial crisis. Financial regulation and supervisions measures were largely unable to keep up with, and put a stop to, risky financial actions.

Joosten (2004) stated that there are sets of general explanations for the events of the Asian crisis. Investor pessimism and panics were at fault. Also, weak macroeconomic fundamentals and the underlying financial systems were to blame. However, Joosten (2004) also suggested that a more plausible reason is the hybrid of both explanations. Furthermore, Joosten (2004) also explained that domestic lending markets suffered from a severe lack of oversight, allowing banks to use unhedged private short term loans for capital input and issuing extremely risky loans, fuelling the asset price bubble that eventually bursted.

Likewise, Aglietta (2008) blamed problems in financial markets for the current global financial crisis. Aglietta (2008) called the structured credit system and its securitization process a "loss generating machine" explaining that such a system makes loan risk information extremely opaque, while actually worsening exposure to risk, instead of reducing it. Furthermore, Aglietta (2008) stated that financial agents failed to realize that individual loans were dependent of one another because they were all supported with real estate as the collateral. When the real estate bubble burst, it affected a very large number of loans simultaneously.

Chan-Lau and Chen (1998) proposed a model of external debt financing representing the actions of depositors, financial intermediaries, and domestic entrepreneurs. They concluded that financial intermediaries are inefficient and have problems monitoring their debtors.

Given all this, it is easy to trace the mistakes made by financial institutions as unregulated for they took larger and larger risks, which did not actually pay off. Observing the huge market for mortgage-backed securities, financial institutions seized the opportunity to make huge profits, by issuing excessive amounts of securities. However, these securities would later turn problematic because of defaults in mortgages and unrealistic valuations of the actual collateral assets due to prevalent price bubbles. Financial institutions issuing assets turned to insurance companies to provide backup in case defaults in mortgages actually did happen. On the other hand, the insuring institutions underestimated the probability of such defaults occurring and agreed to

issue large amounts of securitized loans without actually putting in the necessary reserves to back such securities up.

The absence of supranational regulatory institutions connects to a host of problems. There is a lack of common standards for risk assessment, overreliance on micro-prudential measures in evaluating risky assets, and insufficient capital reserves kept to cover risky assets. There is a lack of foresight in terms of risk assessment, and an overreliance on the assumption that banks are independent of one another. Even the presence of the 2004 Basel II Accord, which is a framework created to serve as a standard in measuring minimum capital adequacy with respect to issuing financial derivatives, was not enough to discourage such behavior. A cause for this may be that the Basel II framework does not have a supranational institution to back it up.

3 Adjustments in the Balance of Payments Imbalances

3.1 Accommodating Transactions in the Balance of Payments Accounts

A deficit or net outflow of monetary assets in the current account must be offset by a surplus or a net inflow of monetary and financial assets in the capital account to achieve balanced national accounts. Similarly, a surplus or net inflow of monetary assets in the current account must be offset by a deficit or net outflow in the capital account in the balance of payments. If the current account deficit is not financed wholly by a surplus in the capital account, there will be changes in the official transactions.

The country can decrease its international reserves, sell gold or use its special drawing rights (SDRs) allocation at IMF in order to lessen the imbalance in its BOP. On the other hand, if the current account surplus is not fully covered by a deficit in the capital account, the country will accumulate more international reserves and gold or increase its allocation of SDRs.

On the other hand, if a country chooses to lessen its reserves, it becomes more vulnerable to contagion effects and attacks on its currency as seen in Asian countries during the 1997 AFC. China was able to insulate itself from the currency devaluing effects of this crisis largely due to its reserves. With the prevailing global financial crisis, it may more likely hold on to its reserves in case a contagion effect on Asian investments occurred again.

The East Asian region was not able to temper the accumulation of reserves because capital and financial assets were flowing into the region. Since foreign direct investment is a function of the capacity of the sending country to provide technology together with funds many economies in the region are unable to provide foreign direct investment overseas. With the exception of Japan and South Korea many of these economies with huge balance of trade surpluses are developing and emerging economies with limited technology to share and transfer abroad.

Moreover, these economies with balance of trade surpluses were unable to use their surpluses via financial flows because of capital control. There are restrictions in the amount the private sector can make financial transaction overseas. As a result of limited foreign direct investments abroad as well as the restrictions in the financial transactions, the only option open for these economies, particularly China, was to accumulate huge international reserves.

3.2. Changes in the Exchange Rate

A current account deficit may also be addressed by devaluing the domestic currency. An increase in the domestic currency value of foreign goods will discourage imports and encourage

exports, since this renders the foreign currency price of exports relatively cheaper. Similarly, a current account surplus can be addressed by an appreciation of the domestic currency.

Notions that China's currency is undervalued have sparked debates on whether or not to appreciate its currency with respect to the $. Rogoff (2007) together with Kim and Yang (2008) postulated that greater exchange rate flexibility in Asia can help reduce the imbalances in the BOP accounts of the United States and China. Cooper (2006) mentioned two arguments for adjusting China's undervalued currency. First, it will help reduce global imbalances. Second, it will help avoid the overheating of China's rapidly growing economy. Moreover, greater monetary flexibility in the face of economic shocks can be obtained from a more flexible exchange rate regime (Kim and Yang, 2008).

However, a real appreciation in China's domestic currency can lead to inflation since this triggers economic activity (Kim and Yang, 2008). Aside from this, Kim and Yang (2008) warned that huge adjustments and regulatory mechanisms are to be put in place if a change from a managed to a more flexible exchange rate regime is to be made, or else the country might experience a crisis due to an unorderly shift in exchange rate policy. On the other hand, Rogoff (2007) also warned that the effects of autonomous exchange rate adjustments must not to be counted on as the main drivers of bringing balance to BOP accounts but adjustments in savings and investment imbalances should also be looked at instead. Devereux and Genberg (2007) deemed that an appreciation in China's currency even improves the current account balance at low trade elasticity, and lowers the current account balance by only 1.5 percent of GDP assuming a high level of trade elasticity.

3.3 Changes in Domestic Expenditure

A current account deficit implies excessive domestic demand that cannot be met by domestic production. Hence, there is a need to curb domestic demand including consumption through higher taxes, investments through higher interest rates, and government expenditure through reduced fiscal deficit and through a budget surplus. On the other hand, a current account surplus implies that domestic demand is deficient in meeting domestic production. Such, there is a need to expand domestic consumption through lower taxes, investments through lower interest rate, and government expenditure through deficit spending.

A contractionary fiscal policy is an option to cool down overheating economies since it also has the effects of contractionary monetary policy without the additional inflow of capital and increased exchange rates (Kim and Yang, 2008). Salvatore (2007) suggested that the deficit of the United States may be lessened through a contractionary fiscal policy and that the surplus of emerging economies like China be reduced by fiscal expansion. These, together with a contemporaneous restructuring of other economies like Japan and Europe, should be able to bring balance to the current accounts of these economies (Salvatore, 2007). Devereux and Genberg (2007) agreed that fiscal policy is an effective measure in bringing balance to the BOP and compared to a nominal adjustment in the exchange rate, it is not so much affected by elasticities in trade between two countries. However, Salvatore (2007) warned that fiscal policy must be used with caution because rapid shocks in one country's expenditure could render other countries to slow to adapt, thus putting them to a disadvantage, reducing their economic growth, and driving them to be less likely to trade with other nations. With respect to the United States–China relationship between their respective BOPs, Eichengreen and Park (2006) suggested a contemporaneous adjustment in fiscal policy between the two countries such that the United States must decrease its spending so that it lessens demand and imports as well as

to adapt to the slowing down of their demand. On the other hand, China should increase domestic spending in order to create a buffer that would absorb the lost demand for its products.

4 Mitigating the Financial Crisis: Implications for Regional Cooperation

4.1 The Need for More Exchange Rate Flexibility

When a country is experiencing a current account surplus, it is a sign that its currency is undervalued. This means that the real exchange rate of the currency is depreciating making the products of the country more attractive to foreign buyers (Blanchard, 2003). A depreciation of the real exchange rate will make the goods of these countries particularly cheap (Blanchard, 2003). One way of eliminating the imbalances is to appreciate the currency to offset the relative decline in domestic prices relative to foreign prices. With the appreciation of the currency, the growth in the export sector may be tempered and excessive accumulation of reserves can be mitigated with the reduction in the BOP surplus.

However, countries experiencing BOP surplus may not want to pursue appreciation of the currency since this may put to a disadvantage their huge export sector. Adjustment costs in the export sector as well in the import substituting sector may be huge with the inflows of imports. However, if trade between these two countries is inelastic, then a minor adjustment in the currency of one country should not adversely affect the adjusting country that much, as mentioned by Devereux and Genberg (2007).

Note that after the 1997 AFC, financial markets in the region started practicing float regimes in their exchange rate so that their currencies can easier adapt to shocks in the economy.

4.2 Changes in Domestic Expenditures

An economy can use expansionary fiscal and monetary policy and translate the BOP surpluses into domestic activities. This may promote economic growth, but is also quite inflationary.

As a country grows through expansionary fiscal and monetary policies, it can create inflationary pressures and domestic prices may go up. Rapid increases in the domestic price lead to the appreciation of the real exchange rate which may lead to lower exports and higher imports. Moreover, expansion of the domestic demand may mean that rapidly growing regions/sectors may slow down because the previously slow growing regions/sectors will now be promoted. There are two reasons why rapidly growing regions may slow down. First, these sectors are mostly likely the export-oriented sectors and their elbow room for expansion from domestically initiated programs may be limited as they have reached a saturation point. Second, domestic expansionary policies are intended for the expansion of government expenditures, consumption and domestic investment, exports growth is influenced by the expansion in the external sector.

4.3 Regional Cooperation in the Development of the Capital Market

4.3.1 Asian Currency

An important initiative arising from the financial crisis is the creation of an Asian Monetary Unit (AMU) that can be used as a yardstick in monitoring the movements of the national currencies and other indicators of economic stability. Aside from surveillance purposes, the proposed AMU can be used for transaction purposes including the possibility of being a unit of account of bond issues. The AMU is a composite of the weighted average of the value of various Asian

currencies relative to the major currencies. The usual weights are based on the size of GDP, trade intensity, and amount of reserves of the member countries.

The creation of an AMU, as a parallel currency, was suggested by Barry Eichengreen in 2006 as a viable alternative to an Asian monetary system. As an equivalent currency, the AMU can circulate alongside with existing national currencies. As proposed, it can be used by participating central banks' international reserves in recording transactions among member banks as well as in denominating bond issuances (Parrenas, 2006).

The proposed AMU can lead to the establishment of regional monetary union by serving as an indicator for monetary authorities in formulating and coordinating their monetary policies to promote convergence of exchange rate systems. Although the AMU can be used as a reference currency, it can initially be the basis for a regional currency in the future when the region is ready for monetary integration. However, monetary union is seen here only as a very distant possibility rather than a clear objective to which structure and function of the AMU are oriented (Parrenas, 2006). Looking at the diversity of the economies in the region, a lot of adjustments must be made on the part of the developed and developing countries and this would take time in order to be achieved.

The interest in monetary cooperation in East Asia stems primarily from the search for an optimal exchange rate regime. As countries abandoned fixed exchange rate and adopted a floating exchange rate regime, they became wary about floating exchange rate because of the instability that it can bring to the domestic economy. However, at the regional level, a monetary union could be an alternative to both fixed and flexible regimes at the national level.

Additionally, countries in the region adopting a flexible exchange rate regime do not want extreme volatility in the exchange rate. Stability of exchange rate rates is still a preferred medium or long-term policy targets even for the flexible regime in spite of the short term fluctuation of exchange rates. If East Asian economies will adopt inflation targeting as a policy under a flexible exchange rate, there is a need to promote monetary policy coordination to decide the appropriate range for their joint target inflation rates.

Madhur (2002) argued that the loss of sovereignty over monetary policy will be outweighed by the benefits of having a common Asian currency. These benefits are increased flexibility in wages and prices, enhanced mobility of factors of production, more symmetric shocks, and more openness and interdependence among countries involved in the currency union.

Another motivation is the belief that a monetary union in East Asia may be a desirable scheme for avoiding competitive devaluation of regional currencies. For many East Asian developing countries with common export markets, the fluctuation of their exchange rates against the Japanese Yen and the Chinese Yuan could critically affect the competitiveness of their exports. In fact, it was a depreciation of the yen against the dollar that resulted in the current account deficit for these countries in the mid 1990s, which might have been closely related to the subsequent currency crisis in the region.

Finally, as intra-regional trade and investment expand, there is a need for policy coordination to stabilize intra-regional exchange rates of East Asian currencies. A monetary union would be a long term goal and could not be created instantaneously. However, once East Asia starts to establish an institutional framework to support market–driven integration there is a strong possibility of a higher level of economic integration including the formation of a monetary union (Ryou and Wang, 2003).

Ryou and Wang (2003) enumerated four problems of establishing an Asian currency. First, due to diverse levels of economic development and stages of economic growth, it will be difficult for East Asian countries to agree on a common policy goal for monetary coordination. Second, compared with the European Union, capital account liberalization in East Asia was pursued before a formal coordination mechanism for exchange rate stability. Third, it would be difficult for the countries in the region to adhere to rules of a unified monetary policy in the absence of an institutional framework. Lastly, although Japan is a major economic power in the region, it may be difficult for the country to take the leadership role in monetary coordination because of its lethargic economic performance in the last decade.

The fragmentation of regional financial markets is another obstacle to integration. Accounting standards, prudential ratios, tax rules, corporate governance standards and other core aspects of regulatory regimes are inconsistent and often inadequate. The East Asian region lacks the harmonized and robust financial infrastructure to support cross–border investments in financial institutions and to facilitate the growth of regional financial service providers (Akhtar, 2004).

Likewise, Rana (2002) mentioned three constraints in developing a single currency for the region. First, is this form of regional integration would only aggravate the moral hazard problem faced by the IMF and its member countries. Second, there is a lack of political will among the proponent countries for this AMU. According to Rana (2002), they still lack the "integrationist thinking" and are preoccupied with their own domestic issues. Lastly, developing a single currency for the Asian region is too premature since it takes a certain degree of preparation and financial integration for this to take place. Due to the lack of regulatory standards and a naïve regional financial architecture, having a common unit of currency remains to be a long-term goal for the Asian region (Rana, 2002).

4.3.2 Asian Bond Market

Economic stability particularly financial stability has been a major concern after the financial crisis that hit the region in the late 1990s. Since then, there have been growing regional proposals toward financial and monetary integration in East Asia. The Chiang Mai Initiative is one of such regional efforts for financial integration. Aside from contributing to financial stability and integration, the idea of creating a regional bond market is intended to improve the allocation of resources in East Asia. According to Kawai (2004), this creates an opportunity for countries that generate high savings to channel their resources into a common income generating fund. In addition, the issue of efficiency of a regional bond market over a global bond market has been raised in diversifying sources of corporate financing and opening new and long term investment opportunities (Kawai, 2004).

Given the continuing globalization of financial markets coupled with advances in financial technology that allow financial firms in global financial centers to reach investors and borrowers in remote corners of the world, there are no guarantees that regional bond markets can be as competitive as the international capital markets in North America and Europe. The combined size of nine bond markets of some Asian economies only add up to 7 percent of the US bond market, and 12 percent of Japan's (Fabella and Madhur, 2003). In addition, a lot of groundwork preparation and harmonization has to take place between the financial markets and systems of the different Asian countries involved. Improvement in local market conditions and regulation are to be accomplished first. Moreover, according to Fabella and Madhur (2003), since other Asian countries lag far behind the advanced standing of markets like Hong Kong, Singapore and Taiwan, it will take time for these developing countries to achieve the same standards that

advanced financial markets have. However, there are a number of reasons why ASEAN +3 join forces in pushing for the establishment of a regional bond market, whose benefits are seen to outweigh the preparations for such an arrangement.

First, consistency is seen in the savings generated by Asian countries like China, Japan, South Korea, Singapore, Brunei, and Malaysia. At the other extreme, low and middle income countries in the region are in need of funds to finance various development endeavors. Given the economic dynamism of the region and the availability of a large pool of savings, East Asia can support large and efficient regional bond markets that may be as competitive as global bond markets. It can be argued that an efficient regional bond markets can provide alternative and possibly cheaper sources of financing to domestic and global bond markets and to East Asia's sovereign and corporate borrowers.

Moreover, a regional bond market can pave the way for the development and strengthening of the financial sector. As the bond market assumes a large share of corporate financing in the region it could lead to a more balanced financial system away from bank-centered system, which is one of the posts. Institutional and private investors would also gain from a regional bond market as they improve their risk and return structure with diversification given the variety of bond instruments. According to Eichengreen and Park (2006), it may also be true that Asian bond markets will be more effective in evaluating and monitoring investment and other corporate activities of East Asian firms as the participants would be more familiar with and have access to more information about regional issues in East Asia.

However, this informational advantage enjoyed by the regional bond markets may not be as significant in the light of accessibility of information as a result of the improvement in corporate governance, disclosure, and information technology. With the improvement in access to information, harmonization of legal and regulatory systems and standards, and advances in financial technology that allow investors from the remote corners of the world access to capital market services offered by international financial centers, future prospects for developing robust capital markets in East Asian countries may not be as promising. With the internationalization of finance, it may be difficult for East Asian countries to convert their bank–centered financial system into a more balanced financial system (Park and Park, 2003).

Although there are benefits to a regional bond market as a response to the asymmetry in resource mobilization, there are limitations as well in such regional effort mainly arising from its efficiency and competitiveness relative with the global financial market. Any informational advantage of a regional bond market over global financial market can be dissipated by access to information due to disclosure, advancement in technology and improvement in governance.

Meanwhile, since good architectural design and preparation for a common bond market remains to be seen, Fabella and Madhur (2003) suggested that the East Asian region focus on improving and sustaining good economic fundamentals and not merely rely on short term speculation of foreign investments; developing local bond markets whilst sustaining a high level of market activity in these; completing the restructuring of a more stable banking sector; giving emphasis on strong corporate governance mechanisms and market regulation; and seeking out a broader investor base in order to increase bond market size and transaction volume.

4.3.3 Regulatory Framework

The proposed regulatory framework will be required to fulfill a number of crucial needs in order to provide comprehensive regulatory measures for financial stability. The first among these

would be the need for a common set of standards for assessing financial risks. The second would be the need to balance and promote the goals of reducing risks, and of minimizing the costs involved in putting up reserves for risky assets. The third would be the need to take a more comprehensive approach to risk evaluation by using both micro-prudential and macro-prudential standards in assessing risks. Finally, there is a need to address both national interests and regional or global concerns, in the development of a supranational regulatory body.

5 Conclusion

Financial stability and security are deemed to be a global or regional public good. They exhibit the characteristics and the caveats associated with public goods applied to an an international setting. Major international institutions such as the World Bank and the IMF have recognized financial security as a “global public good wherein no one is required to maintain it but everyone can benefit from it” as mentioned in Gardiner (2002). Moreover, they have also recognized the need to improve and enhance global financial security as well as the lack of success the global community has had in trying to achieve it.

The quest for financial stability has been met with a number of issues. The first among these is the problem of valuation caused by the fact that while a large number of countries stand to benefit from the provision of public goods, it is probably not the case that they all stand to benefit by the same amount. Due to varying structures and conditions, countries at differing levels of economic development will value the benefits of public goods and the cooperation necessary to provide these goods in a certain region differently (Ferroni, 2004). Sandler (1998) also suggested that other factors may also affect public good valuation such as differing spillover effects, differing levels of perceived and actual uncertainty, and differing ratios of local and transnational benefits. Ferroni (2004) also noted that regional policies seeking to enhance regional public good production may lead to underproduction as countries will still tend to favor national interests rather than regional concerns for they do not usually take into account the impacts of their actions on other nations.

Another issue present in the production of regional public goods is regarding sources of financing. Given the nature of these goods, concerned regions specifically the poorer ones may tend to take a free rider position by dedicating a relatively smaller amount of funding into the production of the good because they assume that more advanced countries will take the lead in financing such projects. Sandler (1998) explained that analyses of public goods commonly suggest that they abide by a “summation technology of supply aggregation” implying that the contribution of one agent serves as a perfect substitute for the contributions of all others. This condition is said to cause similarities to a Prisoner’s Dilemma game where the dominant strategy of members is not to produce any of the public good at al. As what Gardiner (2002) have stated, poorer countries may actually end up benefiting the most from the provision of the financial security public good as their economies may not be as well equipped to deal with financial risk. This may lead to further disequilibrium as the countries that need the public good the most are the ones who are not paying anything for it or not doing anything to produce it.

A related financing issue is the fact that there exists a need to involve most of the concerned entities in the production of a public good. As explained by Schiff and Winters (2002), a lack of cooperation among nations has its share of negative effects, as such non-cooperation may indeed occur due to the aforementioned differences in valuation problem. Moreover, it becomes important for stronger countries and other international entities to induce cooperation from member countries through agreements and incentives. Such incentives may take the form of

rich countries actively choosing to allow “free rider” behavior by providing the public good despite a lack of payment or cooperation from poorer countries. In such cases, the richer countries essentially act as subsidizers of poorer ones as they pay to provide for benefits that these poorer countries do not pay for. In lieu of this, rich countries, or the region as a whole, may also seek to provide incentives for poorer countries to ensure universal participation. (Sandler, 1998)

One final problem is balancing national interests and regional benefits. It is a reality that countries usually prioritize their own costs and benefits during the decision-making process. They tend to favor their own national interests over regional benefits. Moreover, they also tend to have policy goals that extend beyond considerations of economic stability. A lack of trust between member countries may also become a problem as it can cause these countries to become reluctant to enter into any agreements for fear of rising political tensions, threat of abuse, and non-cooperation by other countries (Schiff and Winters, 2002). Given these conditions, the willingness of countries to surrender their sovereignty and control on monetary policy may be low especially for poorer countries, which may lack the advanced regulatory institutions of their neighbors.

Chapter 6: Summary and Policy Implications

1 Summary of Results

The key findings of the Report are as follows:

(a) **Trade**. The Report highlights the growing role of East Asia in world trade and the rising volume and intensity of intra-regional trade in East Asia. Much of the rise in intra-regional trade is in manufactured parts and components, especially in the electronics and automotive sectors. This is the manifestation of the significant growth of production networks in the region, that have made the region the hub of global manufacturing; i.e., "Factory East Asia".

China has become the hub of Factory East Asia. Micro parts from Japan, South Korea, and other OECD countries are exported to ASEAN countries (especially Malaysia, Philippines and Thailand) and China for assembly into components to be exported to (primarily) China for final assembly and integration into final goods like consumer durables. Such final products are then used at home (in China) or exported to the rest of East Asia or to the rest of the world (mainly the United States and the European Union). Thus, product and process complementation among the countries is at the heart of the regional production networks.

As factory to the world, about one-half of intra-regional trade in parts and components in East Asia is attributable to demand from countries outside of East Asia, primarily the United States and the European Union. Thus, there is some element of a triangular relationship among ASEAN, Northeast Asia, and (mainly) North America. It also suggests that East Asia cannot be "decoupled" from North America (US largely) simply because the latter is a major destination of East Asian exports to the rest of the world. The recent global crisis brings this "layered integration" or "tiered integration" with the US (e.g., Philippine indirect integration with the United States via China through the Philippine exports to China as inputs to Chinese products that get exported to the United States). Thus, a drop in China's exports to the rest of the world, especially the United States has a knock –on negative effect on the rest of East Asia that supplies the inputs used in China's exports to the United States and the rest of the world.

(b) **Foreign direct investment**. An important facilitating factor for the sharp rise in overall trade and intra-regional trade in East Asia has been foreign direct investment. For one, it is foreign investments that catalyzed the development of regional production networks in the region. This is not surprising because the very nature of production networks is that production processes are cut up and distributed geographically to make full use of differences in factor costs. In many cases, the cutting up necessarily means the establishment of subsidiary plants in various parts of the region (and elsewhere) as part of the whole production network. It is also worth noting that in many cases, related supplier firms co-move with the multinationals and in the process create some kind of an industrial cluster in the different parts of the region.

Data on foreign direct investment in the region shows that China has been the biggest gross and net recipient of foreign direct investment, followed by the two

small newly industrialized economies of Singapore and Hong Kong. Much has been said of the "round tripping" phenomenon in China that bloated the gross figures of foreign direct investment into China; nonetheless, China remains the number one destination in developing East Asia of foreign direct investment even after some reasonable adjustment for the "round tripping" phenomenon. The FDI inflows into Korea has also been substantial during the past decade; this is worth noting because before the East Asian financial crisis, Korea was not particularly open to foreign direct investments in sharp contrast to the FDI-driven Singapore economy. Among the major developing ASEAN countries, Thailand has been the largest net receivers highlighted by the sharp rise in net investment during the East Asian financial crisis (mainly because Japanese loans to Japanese subsidiaries were changed to equity as a means of helping the subsidiaries cope with the crisis). The net outflows from Indonesia during much of the post-East Asian crisis period had much to do with domestic troubles in the country; the much improved political and macroeconomic environment in the country in recent years has led to the sharp uptick in net foreign investments into the country. The case of Indonesia and for that matter, the Philippines (the weakest performer among the major East Asian developing countries on a per capita basis), suggest that the determinants of foreign direct investment have become more complicated beyond the usual market size, factor price, etc. considerations to include variables like the quality of governance and political stability (see e.g., Intal, Borromeo and Javier, 2008).

Two things need to be emphasized about the rise in foreign direct investments in East Asia:

(i) The first is that the European Union is far way the largest recipient of gross foreign direct investment inflows, followed by the United States. In part this is reflective of the large role of mergers and acquisitions in global foreign direct investment, and much of M & A is among developed countries. Here, it is also worth noting that net flow of foreign direct investment in the European Union and (in some years) the United States has been largely negative during the past decade. This means that the European Union countries (and in some years, the United States) have been largely net investors to the rest of the world, primarily in East Asia, Eastern Europe and the United States.

(ii) The second point that needs to be highlighted is that for all the importance being heaped on foreign direct investment, the most important source of growth and competitiveness is domestic investment. Much of the enterprises, mainly small and medium enterprises that comprise a local production network or industrial cluster is domestically owned, even if many are linked to foreign owned firms through subcontracts. Nonetheless, the determinants that matter to foreign direct investment, including such factors as the quality of infrastructure and bureaucracy are in fact the same concerns of the domestic investors. Thus, the flow of foreign direct investment is reflective of the overall domestic investment climate.

(c) **Portfolio flows**. Portfolio flows in East Asia during the past decade have been far more volatile and mixed as compared to foreign direct investment. This is not

surprising to some extent given that portfolio flows are far more sensitive to macroeconomic and short term factors than direct investment. Nonetheless, as discussed below, the volatility has also to do with the still relatively underdeveloped capital markets and policies on capital flows in a number of developing East Asian countries.

The Report notes that there was a surge of portfolio inflows into East Asia before the East Asian financial crisis. This is the result of the easing of capital controls in much of the region, the recession and low interest rate regime in the early 1990s in the developed world, the rise of institutional investors like pension and mutual funds, etc. that need to balance out risks and returns of their growing portfolios, and the rise in the credit worthiness and more robust potential returns from investments in the region as a result of policy reforms and the on-going so-called East Asian Miracle. The East Asian financial crisis led to a major reversal of portfolio flows: during the 2001-2006 period, net flows have largely been negative for the East Asia region as a whole.

The Report indicates the following points.

(i) First, it is the European Union and the United States that are the major players in the region's portfolio flows, not East Asia.

(ii) Second, among East Asian countries, it is Japan, Singapore, Hong Kong, and (to a far less extent, South Korea) which are the major portfolio investors.

(iii) Third, the volume of inflows and outflows of portfolio investments revolve mainly around the four countries while the flows for the developing ASEAN countries are more volatile.

(iv) Fourth, the data for China are not available.

The key points suggested by the data in the Report are both not surprising but at the same time sobering. The dominance of Japan, Hong Kong and Singapore is not that surprising because the financial markets in the three states are the most developed in East Asia and where capital controls are nil. The surge in portfolio flows into Korea reflects the greater openness of Korea to foreign investment, both direct and equity. It is also probably not surprising that East Asia has net capital outflows because the region has become a major saver, with many of the countries having current account surpluses after the East Asian crisis.

However, that East Asia comes a poor third to the United States and European Union as a portfolio investor in East Asia is sobering. This indicates two important critical points:

(i) First, the capital markets in many of the developing East Asian countries are thin or do not have the financial depth and sophistication to allow for portfolio balancing at minimal cost for savers and portfolio holders in the region.

(ii) Second, capital controls are still significant, especially for the most important saver in the region, China. Portfolio management would require the availability of financial instruments at in various currencies and maturities at low transactions cost. Such financial instruments that allow for risk management and at the same time of maximizing returns are still not commonplace in developing East Asia, China included.

The Report does not show data for China. It is not clear why the IMF survey does not include China. Nonetheless, it does suggest that the capital controls on portfolio investments are particularly tight in China, probably as a means of preventing a serious appreciation of the yuan. (Surges in portfolio inflows tend to lead to currency appreciation among developing ASEAN countries in recent years.) Having capital controls on portfolio inflows almost necessarily mean having capital controls on portfolio outflows. Capital controls also prevent full currency convertibility. Hence, there is a lack of a robust trade in financial instruments in developing countries like China even though China has one of the world's highest saving rate and arguably the world's largest stock of savings.

The IMF survey likely pertains to private portfolio flows. With the world's largest horde of international reserves, East Asia (essentially China, Japan, Taiwan, Singapore and Hong Kong) is the world's largest portfolio holder, primarily of convertible currency financial instruments dominated by US. Arguably, East Asia's financial markets can be expected to deepen and widen if a larger share of the international reserves are in fact invested in East Asia financial instruments instead of US Treasury bills and Freddie Macs and Fannie Maes. This issue is discussed further in the Policy Recommendations section below.

(d) **Vulnerability to external disturbances**. The Report used Vector Autoregressive Regressions (VAR) to examine how vulnerable East Asia and ASEAN countries are to disturbances within East Asia and to disturbances from the United States and the European Union. The regressions use quarterly data. The results provide some interesting insights:

(i) The impact of disturbances from the United States and the European Union on East Asia comes through East Asia exports, rather than directly to East Asia gross domestic product. The impact is almost contemporaneous, at one quarter lag. It is worth noting that the impact of United States imports on East Asia exports happen at various lags, which suggests not only nearly contemporaneous effects but also delayed effects distributed at various lags. The impact of EU imports is far less and far later, which brings out that East Asia is really much more tied to the United States than to the European Union.

(ii) Variations in East Asian exports and East Asian gross domestic product are dominated by previous variations of East Asian exports or East Asian gross domestic product themselves. This is reasonable for large economies like East Asia that is the variations are largely internal. The results can also be construed that disturbances in the United States or the European Union that

impacted on East Asian exports would reverberate further in the more recent variations in East Asian exports.

(iii) China's GDP is affected by disturbances in the GDP of the United States, European Union and East Asia. This reflects the fact that China is at the hub of Factory East Asia and is sometimes referred to as Factory of the World. It is worth noting that the share of international trade to gross domestic product in China is so much higher than other countries in the world with similarly large economies. This is indicative of the tremendous role that international trade has played in China's growth process in the past two decades.

(iv) Disturbances in ASEAN exports are accounted for mainly by imports from China (especially) and the United States, almost contemporaneously. Imports from Japan, the EU and Korea also impact on ASEAN exports but somewhat more delayed. Similarly, disturbances in ASEAN GDP are accounted mainly by imports of China, East Asia GDP, and ASEAN GDP. This seems to indicate that the fortunes of ASEAN economies are now tied closely with East Asia, especially China.

The results of the vector autoregressive regressions show clearly that the notion that East Asia is 'decoupled" from the United States (especially) and (also) the European Union is a myth. This is probably not surprising because to a large extent the growth of East Asia is export driven, given the nature of regional production networks in East Asia, and as such disturbances in the United States and (much less so) the European Union would have impact on the region especially through the trade route.

The results seem to suggest also that ASEAN, as a sub-set of East Asia, s more affected by disturbances in East Asia and China. This seems to imply that ASEAN needs concerted efforts at maintaining East Asia economic stability than the whole East Asia region as such. Moreover, disturbances in China have cross-country impacts in the region simply because of its huge size and its position in the regional production networks. This regional impact of large economies in East Asia may need to be highlighted further in regional fora.

The analysis in the paper focused on the trade channel of linkages between East Asia, the United States and European Union. It did not consider the financial linkages. Previous analyses show a strong relationship among equity prices in the region, as well as between East Asian financial assets and those of the United States. This is as expected for countries with virtually free capital accounts such as Hong Kong, Singapore and Japan. The ongoing global crisis have shown how integrated financial markets across the Pacific. East Asian stock markets tanked as much as those in the United States, where the current global crisis started. In addition, the exchange rate channel became particularly important for Japan in as much as the yen appreciation vis-à-vis the US dollar led to a another shock to export oriented Japanese firms in addition to the sharp fall in demand in the United States. This profit squeeze has added to the falls in the equity price in Japan.

Thus, it can be concluded that East Asia is not at all decoupled from the United States not only from the trade side but also from the finance side.

(e) **Global imbalances, macroeconomic adjustments and East Asia.** East Asia experienced two major crises during the past decade or so; namely, the East Asian financial crisis starting in 1997 and the on-going global crisis starting in earnest in 2008. In both cases, the two crises started with a bursting of a real estate bubble, which in turn was a product of access to easy money. In both cases, the bursting of the real bubble occurred with the onset of a recession, the first one in Thailand and the second one, the United States. In both cases, the financial sector and weak oversight or poor prudential regulations are at the heart of the crises. In the East Asian crisis, the trade side was a critical channel that widened the Thai crisis into a regional contagion, in the sense that speculative attacks on the currencies of the Philippines, Indonesia, Malaysia and others in the region (except the yuan) occurred because the sharp depreciation of the Thai baht at the onset of the crisis in July 1997 meant that export performance of the other competitor countries would drastically worsen and thereby resulting in exchange rate pressures. The stock market channel was a secondary channel of transmission, although this was the critical one for Hong Kong (which the government was able to eventually fight off).

In the current global crisis, the stock market is a critical channel of transmission because the structured credit instruments that melted from the bursting of the housing bubble in the United States were traded through the investment houses and sold to financial institutions, mutual funds, etc. internationally. Compared to commercial banks, investment banks and other financial institutions like hedge funds are far more leveraged, thus extensive winding down of positions even in emerging markets was needed to raise the needed liquidity when the interbank market dried up especially after the collapse of Lehman Bros. As a result, the impact of the crisis in United States had an immediate effect on virtually all East Asian stock exchanges. The trade channel was a secondary but tremendous channel that hit East Asia hard because the massive loss of wealth values arising from the stock market meltdown led to sharp drops in consumption (especially of electronics related consumer items as well as automobiles) in the United States, with knock on effect on US imports and East Asian exports to the United States.

It may be noted that the current global crisis, the financial crisis in the United States did not turn into a balance of payments crisis for the Untied States simply because the US dollar is the dominant reserve currency in the world. Hence, a massive currency meltdown for the dollar is rather unlikely although the appreciation of the Japanese yen recently is a result of the flight to quality of private funds. In contrast, the massive depreciations in ASEAN countries during the 1997 East Asian financial crisis is due to the fact the currencies of these countries (e.g., baht, rupiah, peso) are not reserve currencies, and therefore the countries do not have the luxury of paying off foreign debt with monetary expansion using the domestic currencies.

One final note: in the two major global crises during the past three decades, the ultimate foundation of the crises is the massive reallocation of resources to high saving countries in the world, so much so that the challenge was the recycling of

the funds globally. The debt crisis in the early 1980s that affected a large number of developing countries including the Philippines has its roots in the surge in foreign loans to LDC governments in the late 1970s by commercial banks out of London, New York and other finance centers where Petro dollars were deposited. The real interest rate at that time was negative, and at the same time developing country governments were willing to incur large fiscal deficits and funded by foreign loans as a means of maintaining the pace of economic growth in the face of adverse international developments for the developing world. On the other hand, the current global crisis has its roots in the large resource reallocation towards China, arguably with the world's highest saving rate, that allowed the United States much more expansionary monetary and fiscal policies in the country for a significantly long period of time that led to less prudent lending to sub-prime borrowers and unnecessarily extended the real estate or housing bubble.

2 The Way Forward and Policy Implications

The Report and recent developments have shown that despite the much greater integration of East Asia especially in trade, East Asia is not all de-linked or de-coupled from the rest of the world especially the United States and also the European Union. At its face value this is probably not al surprising because East Asia has become a much bigger player in global trade and increasingly also in international finance. Also, East Asia has become more dependent on international trade and finance in propelling its growth.

In exploring ways to move forward for the region in the light of the current crisis, it would be useful to learn some lessons or insights from previous crises in the world. The following are worth emphasizing:

(a) First, drawing from the Great Depression, "beggar thy neighbor" policies would lead to a Kindleberger spiral with continuously declining international trade, level of national output, and rising unemployment.. Disorderly and competitive devaluations at that time gave rise to greater protectionism; the two together led to huge drops in international trade that contributed substantially to the depth and length and severity of the Great Depression. In order to prevent the repeat of the Kindleberger spiral in the current global crisis, it is therefore important that countries to

(i) Have a coordinated regional or international effort to prevent large currency fluctuations while at the same allowing for the secular adjustment of exchange rates to reflect the changing dynamic of saving, investment and trade internationally and regionally. This is almost like a snake where some currencies are pretty close or tied to one another but allowing for orderly appreciation or depreciation of currencies according to the level and secular trend in saving, investment, trade, etc.

(ii) For large economies like China, ensure that implicit or explicit subsidies to export needs to be tempered or not resorted to as much as possible. This practice can also lead to countervailing policies in the third country to counteract the market sapping effect

of such export subsidies on the domestic industries of the importing countries.

(iii) Prevent the raising of tariffs and non-tariffs significantly in importing countries.

(b) Second, the relatively orderly managed industrial adjustment of (mainly) Japan following the Plaza Accord provides a good example of the adjustment to global imbalances. The Plaza Accord was meant to help address the growing trade surplus of Japan vis-à-vis the United States in the 1980s, so much so that the Japanese yen was revalued or appreciated vis-à-vis the US dollar. Japan's response was to encourage the transfer of more labor intensive manufactures out of Japan to mainly Southeast Asia and China. Japan's ODA was also focused on Southeast Asia. The appreciation of the yen in the mid 1980s was also followed by the appreciation of the New Taiwan dollar, which also encouraged the movement of labor intensive manufactures out of Taiwan and into coastal Southern China (eg, Fujian). Hong Kong also moved its manufacturing into Guandong, China as it focused more on services. The confluence of events, initiated by the Plaza Accord, led to the surge in industrial activities in Southeast Asia by the latter 1980s and gave rise to the wider East Asian Miracle (excluding the Philippines).

It is also useful to draw from the academic literature. Specifically, given the very low interest rates in the United States and Japan at present, there is very little leeway in using monetary policy as a major tool for economic recovery. Thus, the most important is a coordinated and global government (primarily) fiscal stimulus program to temper the economic slide and help move the economies towards recovery. This is already being done and the positive response of the stock market to the passing by the US House of Representatives of the Obama stimulus plan is a good sign. In addition, important for the United States especially, the issue of the refinancing of distressed huge financial institutions as a means of regenerating the credit flow into "Main Street" is also being tackled at present in the United States and to some extent also in hard hit European countries like the United Kingdom.

3 Policy Recommendations Toward Managed Adjustment in East Asia

In view of the discussion above, the following are the major recommendations of the Team towards a managed adjustment in East Asia in the face of the current global crisis:

(a) First, *East Asia needs to move more from being Factory East Asia into Market East Asia*. Although the stimulus plans being crafted in the United States and Europe (e.g, Germany) are meant to generate additional expenditures and increase aggregate demand in those economies, it is likely that consumer demand in the western world would not be as robust as during the years before the global crisis. Thus, it is really East Asia that would have to step up in order to raise global aggregate demand and move the global economy forward towards a recovery. Given that Japan is in a steep recession, it is China that has the largest potential of lifting the region with an expansionary fiscal stimulus.

Nonetheless, a coordinated regional (as well as international) stimulus programs for each country in the region is important in order to put more expansionary bang and impact for the whole region and the world. China has indeed such a plan, with at least a one trillion yuan excluding the expenditures for the rehabilitation of Sichuan and the like. The magnitude of China's stimulus plan is even larger as a share of GDP than that of the United States. Other countries in the region are also putting up their own stimulus plans. A special challenge for China is that the stimulus package would need to encourage increased consumer expenditure in the country and thereby moderate the currently high saving rate of the country. Similarly, the challenge for Japan is to raise private investment expenditures as a major element of its stimulus program because Japan has now one of the highest public debt as a ratio of GDP among OECD countries and its history of fiscal stimuli in the 1990s has not been a sterling successes.

(b) Second, *open up further the economies of East Asia for trade, investment and portfolio flows* at least among the countries in the region because Market East Asia necessitates greater openness of economies within East Asia. As the Report indicates, ASEAN GDP is strongly affected by China and to a less extent by Japan and Korea. Similarly, China's GDP is also affected by the state of economic health of the overall East Asian region. The results highlight the interdependence of the countries in the region. Thus, it is important that the strong economic linkages within the region are not weakened by the rise in tariffs or non-tariff barriers by individual countries as a means of protecting domestic producers from abroad. It is also preferable that such interlinkages are strengthened further through further reduction or elimination of barriers to flows of goods, services and factors of production within the region. A corollary to efforts to prevent the rise of protectionism in countries in the region is a concerted effort to prevent dumping by firms within the region, as a means of preventing protectionist backlash that can lead to a Kindleberger spiral.

(c) Third, *it is preferable for China to follow the Japan example of the 1980s in the aftermath of the Plaza Accord*. That is, encouragement of greater investment in other parts of East Asia (mainly Southeast Asia) as well as a substantial rise in official development assistance in the region. However, because China remains cost competitive in labor intensive manufactures, China can not follow Japan's industrial adjustment strategy of moving labor intensive industries out of Japan. It is likely that the increased investments are in natural resource based industries and, as in the case of Chinese investments in Cambodia, low labor cost sensitive products like some types of garments. The more important factor is expanded official development assistance of China in the region. China's ODA could focus on improving customs processing, infrastructure, agricultural technology, etc. in developing Southeast Asia. It can invest on regional goods like research and development programs or addressing regional bads. It is important however for China to subscribe fully to the Paris agreement on Aid Effectiveness as a donor and not only as donee. It would mean that China would have to be part of the OECD DAC.

(d) Fourth, *China may need to open up greater opportunities for Chinese to invest in foreign financial instruments*. This can include the development of a long term "dragon bond" market that would allow for the flotation by foreign governments

and institutions of long term bonds in China. This policy recommendation would necessitate the loosening of controls of capital outflows from China by Chinese nationals. This effort can be expected to raise portfolio flows within the region and thereby help deepen the capital markets in the region.

(e) Items four and five above relate to outflows. However, in order to address the large global imbalance between primarily China (as well as the Gulf Cooperation Countries like Qatar and Abu Dhabi) and the Western world, *it would be prudent to speed up somewhat more the measured real appreciation of the yuan.* As noted previously in the Report, major global crises have been precipitated by serious imbalances between global savings and capital formation. The result had been asset bubbles which have ultimately led to economic declines because asset bubbles are far more difficult to unwind as compared to commodity bubbles. The appreciation of the yuan can be expected to lead to increased imports by China and increased Chinese investments abroad.

(f) Sixth, *a number of developing East Asian countries may need to improve governance and overall investment climate* in order to raise their investment attractiveness and reduce the cost of doing business in their countries. The challenge of improving governance would also pertain to the implementation of official development assistance in the countries.

(g) Seventh, *deepen regional cooperation* efforts in macroeconomic coordination, expansion of risk mitigation programs like the Chang Mai Initiative, strengthening of prudential regulations and monitoring of the financial markets in the region, deepening of development cooperation initiatives in capacity building, human resource development, research and development and trade and investment facilitation, expansion of regional community building initiatives, and implementation of regional public goods. It is important to note that despite the linkages of East Asia with the United States and the European Union, the Report shows that East Asia GDP is most affected by developments and disturbances within East Asia itself.

(h) Finally, *East Asia to get engaged more in policy coordination with the United States and European Union and in the design (or redesign) of the global economic architecture*. This is because East Asia is now well integrated in the international system and disturbances outside the region have significant effects on the region.

In summary, the Report and the current developments in the world show that East Asian countries are integrated (and increasingly so) with each other and with the rest of the world. Given that East Asia has become a major actor in the world economy, in both trade and finance, East Asia (with China and Japan in the lead) would need to deepen its intra-regional linkages and improve regional coordination in economic governance on the one hand, and consider more the ramifications of East Asia's policies on the rest of the world as well as of the impact of policies in the United States (and European Union) on East Asian economies, on the other hand. This implies the need to strengthen policy coordination with the United States and European Union. This also means that East Asia, primarily China and Japan, be intimately involved in the design of the global economic policy environment and, by extension, global economic governance architecture.

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APPENDICES

APPENDIX 1: $EAGDP_t = f(USGDP_t, USM_t, EUGDP_t, EUM_t, EAGDP_t, EAM_t)$

1 Optimal VAR Lag Selection

VAR system, maximum lag order 8

The asterisks below indicate the best (that is, minimized) values of the respective information criteria, AIC = Akaike criterion, BIC = Schwartz Bayesian criterion and HQC = Hannan-Quinn criterion.

```
lags        loglik    p(LR)       AIC          BIC          HQC

   1   -3075.87208           108.340417   110.685059   109.253702
   2   -3016.17401  0.00000  107.523242   111.146780   108.934683
   3   -2972.75573  0.00000  107.267439   112.169872   109.177036
   4   -2892.12450  0.00000  105.728431   111.909760   108.136183
   5   -2840.84363  0.00000  105.201504   112.661729   108.107413
   6   -2767.31580  0.00000  103.907441   112.646562   107.311505
   7   -2677.29531  0.00000  102.044666   112.062682   105.946885
   8   -1454.29600  0.00000   61.113655*   72.410567*   65.514031*
```

The optimal lag structure is 8 based from the lowest AIC and HQC (Gujarati, 2003). Hence, we have a VAR (8) model. Testing for higher order lag structure is infeasible due to lack of observations.

2 Johansen–Juselius Cointegration Test

```
Johansen test:
Number of equations = 6
Lag order = 8
Estimation period: 1993:4 - 2008:1 (T = 58)

Case 3: Unrestricted constant
Rank Eigenvalue Trace test p-value   Lmax test  p-value
   0    0.99985     885.56 [0.0000]     512.02 [0.0000]
   1    0.88231     373.55 [0.0000]     124.10 [0.0000]
   2    0.79222     249.44 [0.0000]     91.135 [0.0000]
   3    0.76938     158.31 [0.0000]     85.085 [0.0000]
   4    0.59398     73.225 [0.0000]     52.278 [0.0000]
   5    0.30312     20.947 [0.0000]     20.947 [0.0000]
```

Both the trace and λ-max test rejected the null hypothesis that the smallest eigenvalue is 0 so we may conclude that the series are in fact stationary (Enders, 2003). The rejection of the hypothesis denotes the number of cointegrating equations, in this case, is at most 5. Since there is cointegration, OLS estimates of the structural relationships have the property of consistency (Mulligan, 2003).

3 VAR Estimation Results

```
VAR system, lag order 8
OLS estimates, observations 1993:4-2008:1 (T = 58)
Log-likelihood = -2612.3771
Determinant of covariance matrix = 5.3364941e+031
AIC = 100.2199
BIC = 110.6642
```

HQC = 104.2882
Portmanteau test: LB(14) = 832.471 (df = 216, p-value 0.000000)

Equation 6: eagdp

	coefficient	std. error	t-ratio	p-value
const	18834.8	11603.5	1.623	0.1390
eam_1	0.0166173	0.0160899	1.033	0.3287
eam_2	-0.00721537	0.0129727	-0.5562	0.5916
eam_3	0.00205953	0.0124124	0.1659	0.8719
eam_4	0.00544608	0.0136266	0.3997	0.6987
eam_5	0.00198841	0.0163957	0.1213	0.9061
eam_6	-0.0363096	0.0216795	-1.675	0.1283
eam_7	-1.94917E-05	0.0216376	-0.0009008	0.9993
eam_8	0.00204523	0.0150505	0.1359	0.8949
usgdp_1	1.50738	2.72818	0.5525	0.5940
usgdp_2	-2.69084	3.64907	-0.7374	0.4797
usgdp_3	-0.573335	3.42462	-0.1674	0.8707
usgdp_4	-0.0474974	3.33714	-0.01423	0.9890
usgdp_5	2.74986	3.85725	0.7129	0.4940
usgdp_6	0.142185	3.10751	0.04576	0.9645
usgdp_7	2.50551	3.25143	0.7706	0.4607
usgdp_8	-3.10172	3.06307	-1.013	0.3377
usm_1	0.00716955	0.0266682	0.2688	0.7941
usm_2	0.00848465	0.0279489	0.3036	0.7684
usm_3	-0.0144150	0.0286689	-0.5028	0.6272
usm_4	-0.0438496	0.0386476	-1.135	0.2859
usm_5	0.0247883	0.0302738	0.8188	0.4340
usm_6	0.0501960	0.0368585	1.362	0.2064
usm_7	-0.0107942	0.0288058	-0.3747	0.7165
usm_8	-0.00927548	0.0348872	-0.2659	0.7963
eugdp_1	-14.1468	21.9264	-0.6452	0.5349
eugdp_2	20.4373	23.3796	0.8742	0.4048
eugdp_3	-20.3640	24.5001	-0.8312	0.4274
eugdp_4	9.91501	23.5950	0.4202	0.6842
eugdp_5	-23.8460	26.4954	-0.9000	0.3916
eugdp_6	-5.61848	25.4090	-0.2211	0.8299
eugdp_7	4.65768	21.9572	0.2121	0.8367
eugdp_8	6.28750	21.0407	0.2988	0.7719
eum_1	1.76594E-05	1.99342E-05	0.8859	0.3987
eum_2	1.17335E-05	1.85365E-05	0.6330	0.5425
eum_3	1.90429E-05	2.00087E-05	0.9517	0.3661
eum_4	-5.77011E-07	2.55844E-05	-0.02255	0.9825
eum_5	-2.62896E-05	2.66684E-05	-0.9858	0.3500
eum_6	9.02584E-06	2.55691E-05	0.3530	0.7322
eum_7	-5.98688E-06	2.36700E-05	-0.2529	0.8060
eum_8	3.99959E-06	1.66030E-05	0.2409	0.8150
eagdp_1	-0.266685	0.555537	-0.4800	0.6426
eagdp_2	-0.615012	0.419367	-1.467	0.1766
eagdp_3	-0.353297	0.472996	-0.7469	0.4742
eagdp_4	-0.255197	0.417735	-0.6109	0.5564
eagdp_5	-0.247185	0.420432	-0.5879	0.5710
eagdp_6	0.147711	0.446844	0.3306	0.7485
eagdp_7	0.396151	0.668934	0.5922	0.5683
eagdp_8	0.402873	0.513824	0.7841	0.4531

Mean of dependent variable = 5675.98
Standard deviation of dep. var. = 840.264
Sum of squared residuals = 977182
Standard error of the regression = 329.508
Unadjusted R-squared = 0.97572
F-statistic (48, 9) = 7.53454 (p-value = 0.00145)

```
  Durbin-Watson statistic = 2.11796
  First-order autocorrelation coeff. = -0.0886485

  F-tests of zero restrictions:

  All lags of eam                 F(8, 9) =  0.76391, p-value 0.6426
  All lags of usgdp               F(8, 9) =  0.35124, p-value 0.9223
  All lags of usm                 F(8, 9) =  0.62549, p-value 0.7401
  All lags of eugdp               F(8, 9) =  0.37441, p-value 0.9094
  All lags of eum                 F(8, 9) =   1.0794, p-value 0.4515
  All lags of eagdp               F(8, 9) =  0.42721, p-value 0.8774
  All vars, lag 8                 F(6, 9) =  0.32940, p-value 0.9051

For the system as a whole:

  Null hypothesis: the longest lag is 7
  Alternative hypothesis: the longest lag is 8
  Likelihood ratio test: Chi-square(36) = 264.082 (p-value 0.000000)

  Comparison of information criteria:
  Lag order 8: AIC = 100.220, BIC = 110.664, HQC = 104.288
  Lag order 7: AIC = 103.532, BIC = 112.697, HQC = 107.102
```

Conventional inference is valid even when the structural variables are nonstationary, provided the residuals are white-noise processes with no serial correlation. It is generally assumed that adding a sufficient number of lagged difference terms in the disequilibrium adjustment process is always sufficient to guarantee white-noise errors (Mulligan, 2003; Gujarati, 2003).

It can be seen from the results that none of the variables as well as its lags are significant in influencing *EAGDP*. This can be associated with a low observation count given a high lag structure.

4 Variance Decomposition

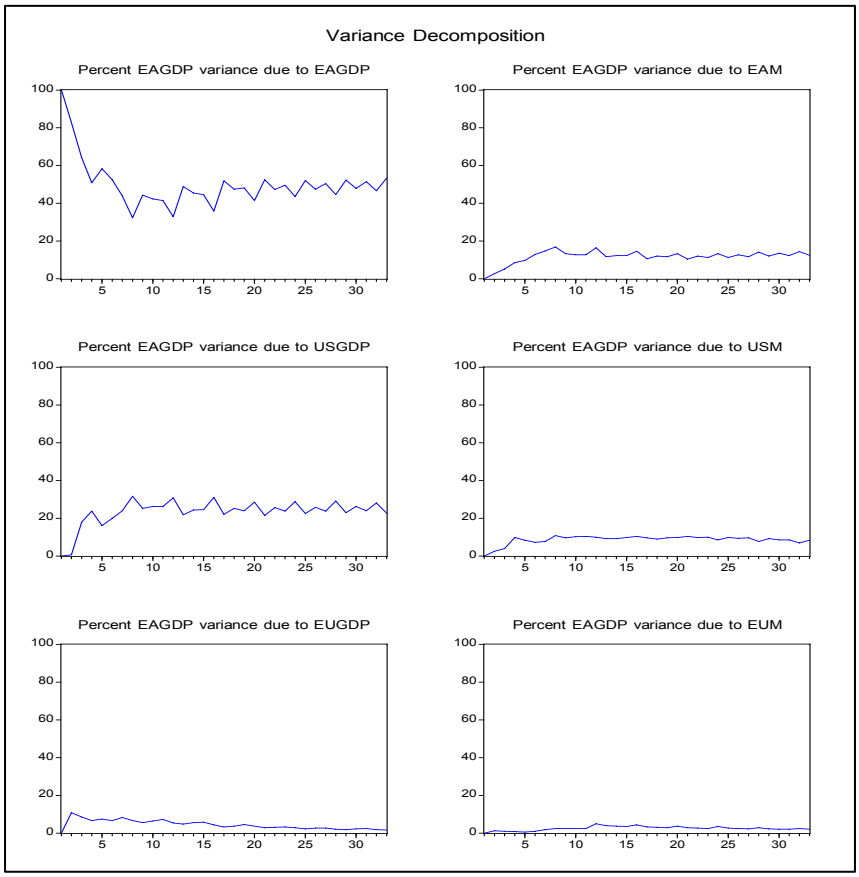
Decomposition of variance for eagdp

period	std. error	eam	usgdp	usm	eugdp
1	129.8	70.5338	1.2864	0.8741	3.0676
2	151.95	70.7436	2.2827	2.1446	4.1679
3	164.463	60.9045	9.1334	3.3698	5.6555
4	181.997	57.5831	7.7496	6.1068	6.0225
5	192.1	53.9900	7.2772	12.0270	5.4850
6	217.751	43.1143	5.6641	23.1282	10.3084
7	229.246	41.8052	6.8218	21.6639	10.9327
8	262.692	37.4055	6.6268	29.6006	10.9261
9	267.287	36.8029	7.0960	29.8932	11.2912
10	270.236	36.4718	7.1213	29.7874	11.5877
11	275.325	35.4517	7.6266	31.1096	11.1715
12	325.033	28.6138	6.0670	42.6968	11.7246
13	329.496	28.4044	5.9793	41.9861	12.1176
14	333.462	27.9168	5.9941	41.0691	12.4346
15	340.799	27.5170	6.4125	42.0812	11.9068
16	365.656	24.3483	5.5712	45.9521	12.4793
17	371.389	23.6027	5.5500	45.9244	12.0972
18	375.673	25.0148	5.4647	44.8946	12.0419
19	381.772	26.3528	5.5588	43.4755	11.6856
20	386.525	26.6317	5.4276	43.3962	11.8635
21	402.526	28.9465	5.3742	40.1720	12.4077
22	406.073	28.4726	5.2808	40.0045	12.2274

23	410.413	28.5095	5.8975	39.4455	12.1551
24	412.806	28.6558	5.8868	39.1453	12.4570
25	419.234	27.9803	6.0100	38.3564	13.5571
26	426.544	27.3699	6.8136	37.2651	13.1263
27	432.178	26.8359	7.2118	37.0570	12.8698
28	435.896	26.5878	7.3745	37.0565	12.6676
29	446.414	26.0594	8.0077	37.5452	12.3384
30	455.108	25.4689	8.2904	37.7258	12.1506
31	465.354	27.3462	7.9448	36.0984	12.4516
32	479.371	27.6319	7.7865	37.2259	12.0844
33	488.046	26.9462	7.7514	37.9322	12.3379

Decomposition of variance for eagdp (continued)

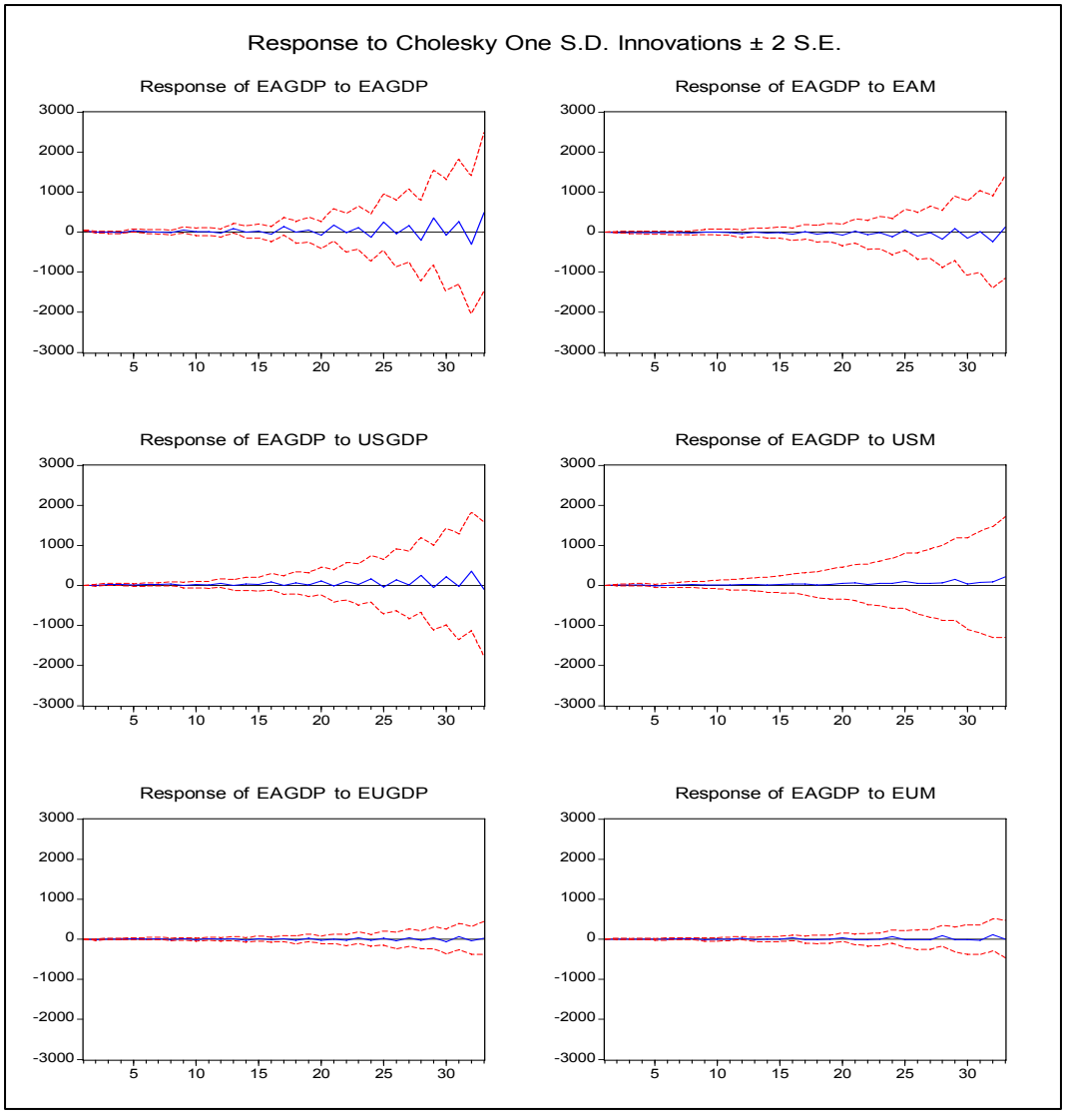
period	eum	eagdp
1	0.4023	23.8360
2	2.0310	18.6302
3	4.1774	16.7593
4	7.4898	15.0482
5	7.2088	14.0119
6	5.7597	12.0252
7	7.6033	11.1731
8	5.9891	9.4520
9	5.7867	9.1300
10	6.0967	8.9351
11	5.9916	8.6491
12	4.3956	6.5021
13	4.5628	6.9498
14	4.8971	7.6884
15	4.7161	7.3664
16	4.4199	7.2292
17	4.3514	8.4743
18	4.2557	8.3283
19	4.2171	8.7101
20	4.1768	8.5043
21	3.8651	9.2346
22	3.8176	10.1971
23	3.9217	10.0706
24	3.8826	9.9724
25	3.8624	10.2339
26	3.9566	11.4685
27	4.0700	11.9556
28	4.0070	12.3066
29	4.0426	12.0067
30	4.7778	11.5864
31	4.8676	11.2914
32	4.6169	10.6544
33	4.6452	10.3870



Most of the *EAGDP* variations are accounted mostly by domestic innovations coming from previous impacts of *EAM*, explained by more than 70 percent after the first quarter and more than 40 percent at two quarter horizon onwards. Comparatively, the disturbances in the *USM* have more explanatory power in accounting for variations in *EAGDP* than *EUM*. Namely, more than 40 percent of the forecast error variance of *EAGDP* is attributed to shocks in *USM* at the 12-quarter to 22-quarter horizons. Meanwhile, the *USGDP* innovations explain only 10 percent, the most, of the shocks to *EAGDP*. Note that the influences of import variables are more immediate. After 33 quarters, approximately 40 percent of the variance in *EAGDP* has been attributable to variation in *USM*, over the period studied.

5 Impulse Responses

Results, at least qualitatively, are reflected in the impulse-response functions plotted. The response functions are plotted together with two standard deviation bands. Generally stated, if the bands do not encompass zero, then the responses are significantly different from zero. The results show that the shocks in *EAGDP* are mainly domestically generated. Indeed, domestic disturbances seem to be the major source of their *EAGDP* fluctuations. We may note that the response of *EAGDP* to one standard deviation shock in *EAM*, *EUM*, *EUGDP*, and *USGDP* is not significant. Meanwhile, *EAGDP* reacts negatively and significantly to innovations in *USM* in quarter 6 to 9. Thus, given the variance decomposition results, the effect of *USM* is relatively more important than the *USGDP* effect in accounting for fluctuation in *EAGDP*.



APPENDIX 2: $EAX_t = f(USGDP_t, USM_t, EUGDP_t, EUM_t, EAGDP_t, EAX_t)$

1 Optimal VAR Lag Selection

```
VAR system, maximum lag order 8

The asterisks below indicate the best (that is, minimized) values of the respective
information criteria, AIC = Akaike criterion, BIC = Schwartz Bayesian criterion and
HQC = Hannan-Quinn criterion.

lags        loglik    p(LR)       AIC          BIC          HQC

   1   -3072.33748           108.218534   110.563176   109.131819
   2   -3002.45091  0.00000  107.050031   110.673569   108.461472
   3   -2955.04505  0.00000  106.656726   111.559159   108.566323
   4   -2890.08505  0.00000  105.658105   111.839434   108.065858
   5   -2850.75923  0.00005  105.543422   113.003646   108.449330
   6   -2785.36855  0.00000  104.529950   113.269070   107.934014
   7   -2663.67440  0.00000  101.574979   111.592995   105.477199
   8   -1300.54199  0.00000   55.811793*   67.108704*   60.212168*
```

The optimal lag structure is 10 based from the lowest AIC and HQC (Gujarati, 2003). Hence, we have a VAR (10) model. Testing for higher order lag structure is infeasible due to lack of observations.

2 Johansen–Juselius Cointegration Test

```
Johansen test:
Number of equations = 6
Lag order = 8
Estimation period: 1993:4 - 2008:1 (T = 58)

Case 3: Unrestricted constant
Rank Eigenvalue Trace test p-value   Lmax test  p-value
   0    0.99503     606.16 [0.0000]     307.68 [0.0000]
   1    0.81498     298.48 [0.0000]     97.861 [0.0000]
   2    0.74030     200.62 [0.0000]     78.197 [0.0000]
   3    0.68818     122.42 [0.0000]     67.590 [0.0000]
   4    0.55639     54.829 [0.0000]     47.144 [0.0000]
   5    0.12411     7.6856 [0.0056]     7.6856 [0.0056]
```

Both the trace and λ-max test rejected the null hypothesis that the smallest eigenvalue is 0 so we may conclude that the series are in fact stationary (Enders, 2003). The rejection of the hypothesis denotes the number of cointegrating equations, in this case, is at most 5. Since there is cointegration, OLS estimates of the structural relationships have the property of consistency (Mulligan, 2003)

3 VAR Estimation Results

```
VAR system, lag order 8
OLS estimates, observations 1993:4-2008:1 (T = 58)
Log-likelihood = -2528.9331
Determinant of covariance matrix = 3.0034874e+030
AIC = 97.3425
BIC = 107.7868
HQC = 101.4108
Portmanteau test: LB(14) = 1023.52 (df = 216, p-value 0.000000)
```

Equation 1: eax

	coefficient	std. error	t-ratio	p-value	
const	412063	329130	1.252	0.2421	
eax_1	0.532481	0.384309	1.386	0.1993	
eax_2	0.788706	0.313811	2.513	0.0331	**
eax_3	0.455981	0.375127	1.216	0.2551	
eax_4	-0.242458	0.452677	-0.5356	0.6052	
eax_5	-0.948055	0.436772	-2.171	0.0581	*
eax_6	0.954005	0.536934	1.777	0.1093	
eax_7	1.14992	0.488292	2.355	0.0430	**
eax_8	-0.640738	0.456302	-1.404	0.1938	
usgdp_1	148.595	62.8443	2.364	0.0423	**
usgdp_2	-7.47110	83.3458	-0.08964	0.9305	
usgdp_3	-44.1702	80.0893	-0.5515	0.5947	
usgdp_4	63.7946	88.4289	0.7214	0.4890	
usgdp_5	-177.440	96.5514	-1.838	0.0993	*
usgdp_6	-86.7295	80.7377	-1.074	0.3107	
usgdp_7	64.9156	85.1695	0.7622	0.4654	
usgdp_8	53.6626	75.3069	0.7126	0.4942	
usm_1	1.02231	0.502806	2.033	0.0726	*
usm_2	-2.22228	0.669539	-3.319	0.0090	***
usm_3	-0.799703	0.862893	-0.9268	0.3782	
usm_4	2.89518	0.843871	3.431	0.0075	***
usm_5	1.07068	0.834448	1.283	0.2315	
usm_6	-2.61563	1.24261	-2.105	0.0646	*
usm_7	-1.58752	0.829778	-1.913	0.0880	*
usm_8	2.52185	0.929857	2.712	0.0239	**
eugdp_1	-1313.37	613.634	-2.140	0.0610	*
eugdp_2	559.055	613.971	0.9106	0.3863	
eugdp_3	466.119	581.770	0.8012	0.4436	
eugdp_4	-715.604	514.064	-1.392	0.1973	
eugdp_5	1192.64	611.768	1.949	0.0830	*
eugdp_6	-535.487	597.317	-0.8965	0.3933	
eugdp_7	-960.574	567.284	-1.693	0.1246	
eugdp_8	676.024	550.661	1.228	0.2507	
eum_1	-0.000548432	0.000573548	-0.9562	0.3639	
eum_2	-4.61975E-05	0.000434950	-0.1062	0.9177	
eum_3	-0.000814345	0.000489164	-1.665	0.1303	
eum_4	0.000221149	0.000633598	0.3490	0.7351	
eum_5	-0.000333767	0.000656334	-0.5085	0.6233	
eum_6	0.000452865	0.000632967	0.7155	0.4925	
eum_7	0.000220751	0.000655588	0.3367	0.7440	
eum_8	-0.00135309	0.000480212	-2.818	0.0201	**
eagdp_1	24.8078	10.7988	2.297	0.0472	**
eagdp_2	-4.84518	10.3960	-0.4661	0.6522	
eagdp_3	-2.17859	10.1829	-0.2139	0.8354	
eagdp_4	-2.25956	8.93770	-0.2528	0.8061	
eagdp_5	-4.80440	8.45097	-0.5685	0.5836	
eagdp_6	17.0626	8.55040	1.996	0.0771	*
eagdp_7	-28.4009	11.9889	-2.369	0.0420	**
eagdp_8	-7.40234	11.6831	-0.6336	0.5421	

Mean of dependent variable = 446091
Standard deviation of dep. var. = 199078
Sum of squared residuals = 6.48069e+008
Standard error of the regression = 8485.73
Unadjusted R-squared = 0.99971
F-statistic (48, 9) = 653.396 (p-value < 0.00001)
Durbin-Watson statistic = 2.29375
First-order autocorrelation coeff. = -0.147488

F-tests of zero restrictions:

All lags of eax F(8, 9) = 6.2124, p-value 0.0065
All lags of usgdp F(8, 9) = 1.8698, p-value 0.1850
All lags of usm F(8, 9) = 3.0987, p-value 0.0560
All lags of eugdp F(8, 9) = 1.6679, p-value 0.2308
All lags of eum F(8, 9) = 1.5888, p-value 0.2521
All lags of eagdp F(8, 9) = 1.7020, p-value 0.2222
All vars, lag 8 F(6, 9) = 2.1929, p-value 0.1394

Equation 2: eagdp

	coefficient	std. error	t-ratio	p-value	
const	20677.9	12085.8	1.711	0.1213	
eax_1	0.0173371	0.0141120	1.229	0.2504	
eax_2	0.00900053	0.0115232	0.7811	0.4548	
eax_3	-0.0104626	0.0137748	-0.7595	0.4670	
eax_4	-0.0166546	0.0166224	-1.002	0.3426	
eax_5	-0.00956722	0.0160384	-0.5965	0.5655	
eax_6	0.0511026	0.0197164	2.592	0.0291	**
eax_7	0.0192339	0.0179302	1.073	0.3113	
eax_8	-0.0385053	0.0167556	-2.298	0.0471	**
usgdp_1	4.02825	2.30766	1.746	0.1148	
usgdp_2	-0.0654596	3.06049	-0.02139	0.9834	
usgdp_3	-2.65989	2.94091	-0.9044	0.3893	
usgdp_4	-0.492636	3.24714	-0.1517	0.8828	
usgdp_5	-4.73126	3.54540	-1.334	0.2148	
usgdp_6	1.85481	2.96471	0.6256	0.5471	
usgdp_7	-0.964921	3.12745	-0.3085	0.7647	
usgdp_8	-1.38987	2.76530	-0.5026	0.6273	
usm_1	0.0237205	0.0184632	1.285	0.2310	
usm_2	-0.0387698	0.0245857	-1.577	0.1493	
usm_3	0.0164248	0.0316858	0.5184	0.6167	
usm_4	0.0859242	0.0309872	2.773	0.0217	**
usm_5	-0.0121118	0.0306412	-0.3953	0.7018	
usm_6	-0.0929511	0.0456292	-2.037	0.0721	*
usm_7	0.00714892	0.0304697	0.2346	0.8198	
usm_8	0.0947562	0.0341447	2.775	0.0216	**
eugdp_1	-14.2150	22.5329	-0.6309	0.5438	
eugdp_2	17.2659	22.5452	0.7658	0.4634	
eugdp_3	12.1431	21.3628	0.5684	0.5836	
eugdp_4	-22.9897	18.8766	-1.218	0.2542	
eugdp_5	24.3872	22.4643	1.086	0.3059	
eugdp_6	-16.9115	21.9337	-0.7710	0.4605	
eugdp_7	-5.21183	20.8309	-0.2502	0.8081	
eugdp_8	23.6919	20.2205	1.172	0.2714	
eum_1	-2.50784E-05	2.10609E-05	-1.191	0.2642	
eum_2	3.95053E-06	1.59715E-05	0.2473	0.8102	
eum_3	7.28709E-07	1.79623E-05	0.04057	0.9685	
eum_4	1.69428E-05	2.32659E-05	0.7282	0.4850	
eum_5	-1.34896E-05	2.41008E-05	-0.5597	0.5893	
eum_6	1.71669E-06	2.32428E-05	0.07386	0.9427	
eum_7	-1.74036E-05	2.40734E-05	-0.7229	0.4881	
eum_8	-3.35238E-05	1.76336E-05	-1.901	0.0897	*
eagdp_1	0.299723	0.396535	0.7559	0.4691	
eagdp_2	-0.634867	0.381746	-1.663	0.1307	
eagdp_3	-0.0365637	0.373921	-0.09778	0.9242	
eagdp_4	0.118989	0.328195	0.3626	0.7253	
eagdp_5	-0.192708	0.310323	-0.6210	0.5500	
eagdp_6	0.189271	0.313974	0.6028	0.5615	
eagdp_7	-1.19013	0.440238	-2.703	0.0243	**

```
  eagdp_8        0.0507428         0.429007       0.1183    0.9084

  Mean of dependent variable = 5675.98
  Standard deviation of dep. var. = 840.264
  Sum of squared residuals = 873846
  Standard error of the regression = 311.599
  Unadjusted R-squared = 0.97829
  F-statistic (48, 9) = 8.44771 (p-value = 0.000922)
  Durbin-Watson statistic = 2.4128
  First-order autocorrelation coeff. = -0.222975

  F-tests of zero restrictions:

  All lags of eax                 F(8, 9) =  0.98728, p-value 0.5018
  All lags of usgdp               F(8, 9) =   1.0072, p-value 0.4905
  All lags of usm                 F(8, 9) =   1.4152, p-value 0.3068
  All lags of eugdp               F(8, 9) =  0.41133, p-value 0.8873
  All lags of eum                 F(8, 9) =   1.2237, p-value 0.3824
  All lags of eagdp               F(8, 9) =   1.4847, p-value 0.2835
  All vars, lag 8                 F(6, 9) =   1.7747, p-value 0.2108

For the system as a whole:

  Null hypothesis: the longest lag is 7
  Alternative hypothesis: the longest lag is 8
  Likelihood ratio test: Chi-square(36) = 478.095 (p-value 0.000000)

  Comparison of information criteria:
  Lag order 8: AIC = 97.3425, BIC = 107.787, HQC = 101.411
  Lag order 7: AIC = 104.344, BIC = 113.510, HQC = 107.914
```

Conventional inference is valid even when the structural variables are nonstationary, provided the residuals are white-noise processes with no serial correlation. It is generally assumed that adding sufficient number of lagged difference terms in the disequilibrium adjustment process is always sufficient to guarantee white-noise errors (Mulligan, 2003).

From Equation 1, it can be seen from the results that all variables are significant in influencing *EAX* at various lags. *USM* is statistically significant in influencing *EAX* at various lags while *EUM* has an 8^{th} lag delay in influencing *EAX*. It can also be noted that the GDP of EA, EU and US have no long delay in influencing *EAX*.

From Equation 2, it can be seen from the results that EAX, USM, EUM, and the lagged values of EAGDP are significant in influencing EAGDP; while the GDP variables for US and EU are insignificant.

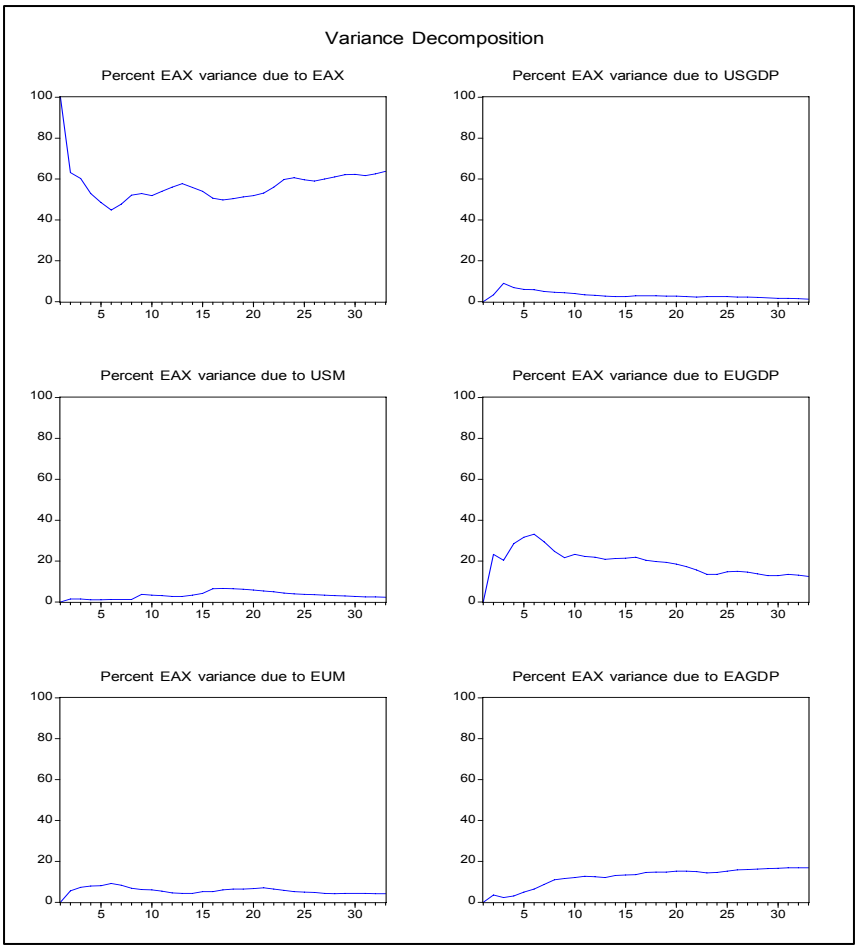
4 Variance Decomposition

```
Decomposition of variance for eax

period     std. error        eax      usgdp        usm      eugdp

   1          3342.69   100.0000     0.0000     0.0000     0.0000
   2          5143.67    64.5353     4.1623    21.7697     2.1109
   3          6466.06    54.1035    10.8782    26.2241     1.7937
   4          6943.53    49.9687    12.6731    24.3488     5.3759
   5          8211.58    49.6005    13.0578    21.6922     8.7999
   6          9147.11    41.8189    12.3378    28.6458    10.1797
   7          9276.09    41.0384    12.0435    28.1470    11.5926
   8          13120.9    23.7795     6.5682    44.2539    20.8743
```

9	16285.9	16.0460	4.2742	40.1037	35.6949
10	16760.6	15.7036	4.1922	38.1992	38.0271
11	19334.3	13.5761	3.6591	44.9586	33.4354
12	27450.8	7.6726	3.5829	48.6662	35.6073
13	31274.9	5.9185	2.7633	44.1527	43.3417
14	32751.1	8.1378	2.5394	41.2586	44.5266
15	39278.8	11.0073	1.9343	42.4869	41.3111
16	49106	8.2873	1.3864	41.3159	45.6468
17	52041.2	8.9236	1.6351	38.1742	47.9494
18	55717.5	14.8162	1.4557	37.3531	43.2643
19	71340.2	15.7350	1.3616	45.9205	33.8293
20	86793.9	13.0623	0.9628	47.6982	35.0644
21	92760.1	15.8301	1.1918	45.2851	34.2878
22	104994	22.1335	0.9310	45.2400	28.5950
23	132806	19.2923	0.7883	50.0094	26.4779
24	150149	18.1869	0.6454	48.1612	29.6398
25	159587	22.7596	0.8634	45.3390	27.6857
26	184962	26.8128	0.7795	46.6787	22.4417
27	225857	22.3312	0.8387	50.1640	23.1003
28	243246	22.6340	0.7548	48.2937	24.7124
29	259488	28.2017	0.6967	45.6459	21.9653
30	307330	28.1974	0.8824	49.2586	18.0391
31	356254	24.1732	0.7841	50.5003	20.7937
32	371759	26.2687	0.9156	48.2330	20.6765
33	400999	32.0293	0.7876	45.7580	17.7736

Decomposition of variance for eax (continued)

period	eum	eagdp
1	0.0000	0.0000
2	0.8168	6.6050
3	1.2555	5.7450
4	2.2401	5.3934
5	2.9022	3.9474
6	2.3708	4.6470
7	2.5146	4.6639
8	1.3697	3.1544
9	0.8891	2.9922
10	0.9777	2.9003
11	1.1907	3.1801
12	1.0381	3.4329
13	0.8135	3.0103
14	0.7562	2.7813
15	0.7067	2.5536
16	0.5410	2.8226
17	0.8032	2.5145
18	0.8675	2.2431
19	0.5397	2.6139
20	0.4943	2.7181
21	0.9973	2.4078
22	0.8582	2.2424
23	0.5373	2.8949
24	0.5849	2.7817
25	0.8329	2.5194
26	0.6292	2.6581
27	0.4367	3.1290
28	0.6828	2.9222
29	0.8599	2.6306
30	0.6144	3.0081
31	0.5168	3.2319
32	0.8931	3.0130
33	0.8864	2.7651



Most of the *EAX* variations are accounted mostly by domestic innovations coming from previous impacts of *EAM*, explained by more than 60 percent after the first quarter and more than 40 percent at two quarter horizon onwards. Comparatively, the disturbances in the *USM* have more explanatory power in accounting for variations in *EAX* than *EUM*. Namely, more than 40 percent of the forecast error variance of *EAX* is attributed to shocks in *USM* at the 8-quarter to 33-quarter horizons. Meanwhile, the *USGDP* innovations are weaker than innovations in *EUGDP*. However, the variance decomposition shows that all other variables aside from *EAX* do not cause variations at the first lag.

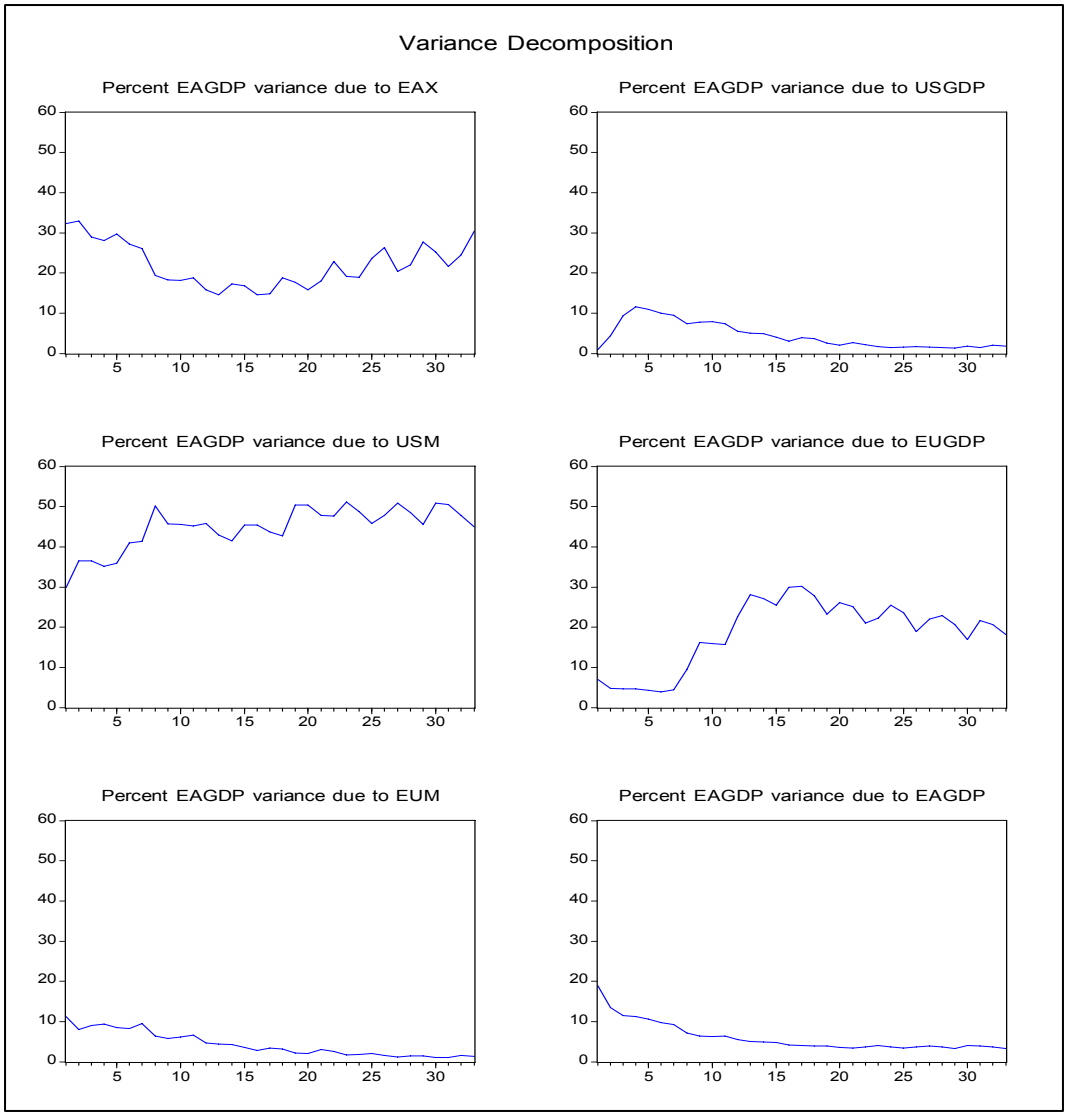
Decomposition of variance for eagdp

period	std. error	eax	usgdp	usm	eugdp
1	122.745	32.2811	0.9469	29.7738	6.9737
2	151.925	32.9579	4.3468	36.5127	4.7473
3	165.219	28.9990	9.4134	36.5087	4.6732
4	168.875	28.0800	11.5852	35.1758	4.6209
5	177.172	29.7291	10.9097	35.8929	4.3093
6	186.064	27.2363	9.9289	40.9733	3.9157
7	191.092	26.0708	9.4577	41.4022	4.3768
8	233.041	19.3616	7.4133	50.1323	9.5012
9	247.98	18.2548	7.7708	45.6643	16.2058
10	249.819	18.1140	7.9104	45.6022	15.9837
11	258.722	18.8013	7.4267	45.1260	15.6561
12	316.137	15.8163	5.5284	45.8441	22.6417
13	331.942	14.5291	5.0362	42.9938	28.0578
14	338.842	17.3142	4.8735	41.4902	27.1222
15	381.53	16.7396	4.0734	45.4127	25.5344
16	442.606	14.5437	3.0723	45.4734	29.9964
17	451.561	14.7574	3.9074	43.6943	30.1529
18	470.062	18.7312	3.6363	42.6649	27.8506
19	576.187	17.6640	2.5651	50.4531	23.2227
20	657.352	15.8654	2.0330	50.3944	26.0721
21	677.976	18.0193	2.6309	47.8475	25.0557
22	750.341	22.8856	2.1525	47.6890	21.0624
23	922.275	19.1504	1.6625	51.1936	22.2862
24	1004.47	18.8624	1.4491	48.8293	25.4315
25	1044.93	23.6757	1.6071	45.7523	23.5603
26	1209.47	26.3350	1.7332	47.7960	18.8520
27	1452.12	20.4254	1.5013	50.9402	22.0644
28	1511.53	22.0465	1.4779	48.4982	22.8477
29	1596.93	27.7480	1.3249	45.5565	20.6053
30	1922.42	25.2889	1.8416	50.9319	16.8606
31	2156.71	21.5971	1.4832	50.4745	21.5831
32	2216.6	24.4324	1.9850	47.7889	20.5887
33	2390.93	30.4694	1.7380	44.9919	18.1322

Decomposition of variance for eagdp (continued)

period	eum	eagdp
1	11.1780	18.8465
2	8.0281	13.4072
3	9.0005	11.4052
4	9.3432	11.1950
5	8.5126	10.6465
6	8.2581	9.6877
7	9.4944	9.1981
8	6.4177	7.1738
9	5.7576	6.3466

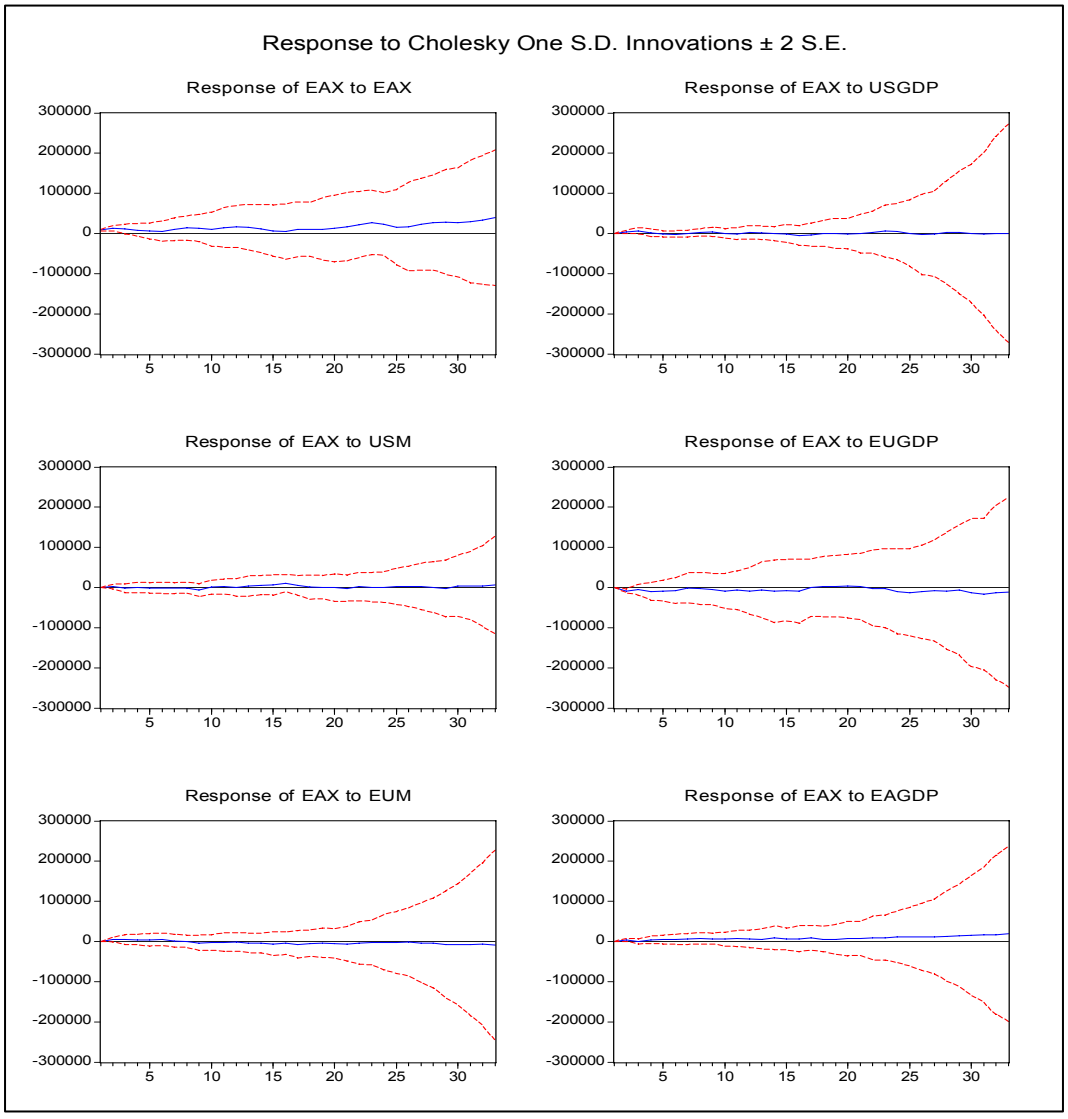
10	6.1355	6.2543
11	6.6178	6.3720
12	4.6664	5.5032
13	4.3879	4.9951
14	4.3345	4.8654
15	3.5068	4.7332
16	2.8095	4.1048
17	3.4163	4.0716
18	3.1526	3.9643
19	2.2135	3.8816
20	2.0969	3.5383
21	2.9868	3.4598
22	2.5108	3.6997
23	1.6623	4.0450
24	1.7886	3.6390
25	2.0372	3.3673
26	1.5905	3.6933
27	1.1266	3.9421
28	1.4741	3.6557
29	1.4692	3.2960
30	1.0797	3.9973
31	1.0166	3.8456
32	1.5327	3.6724
33	1.3478	3.3207



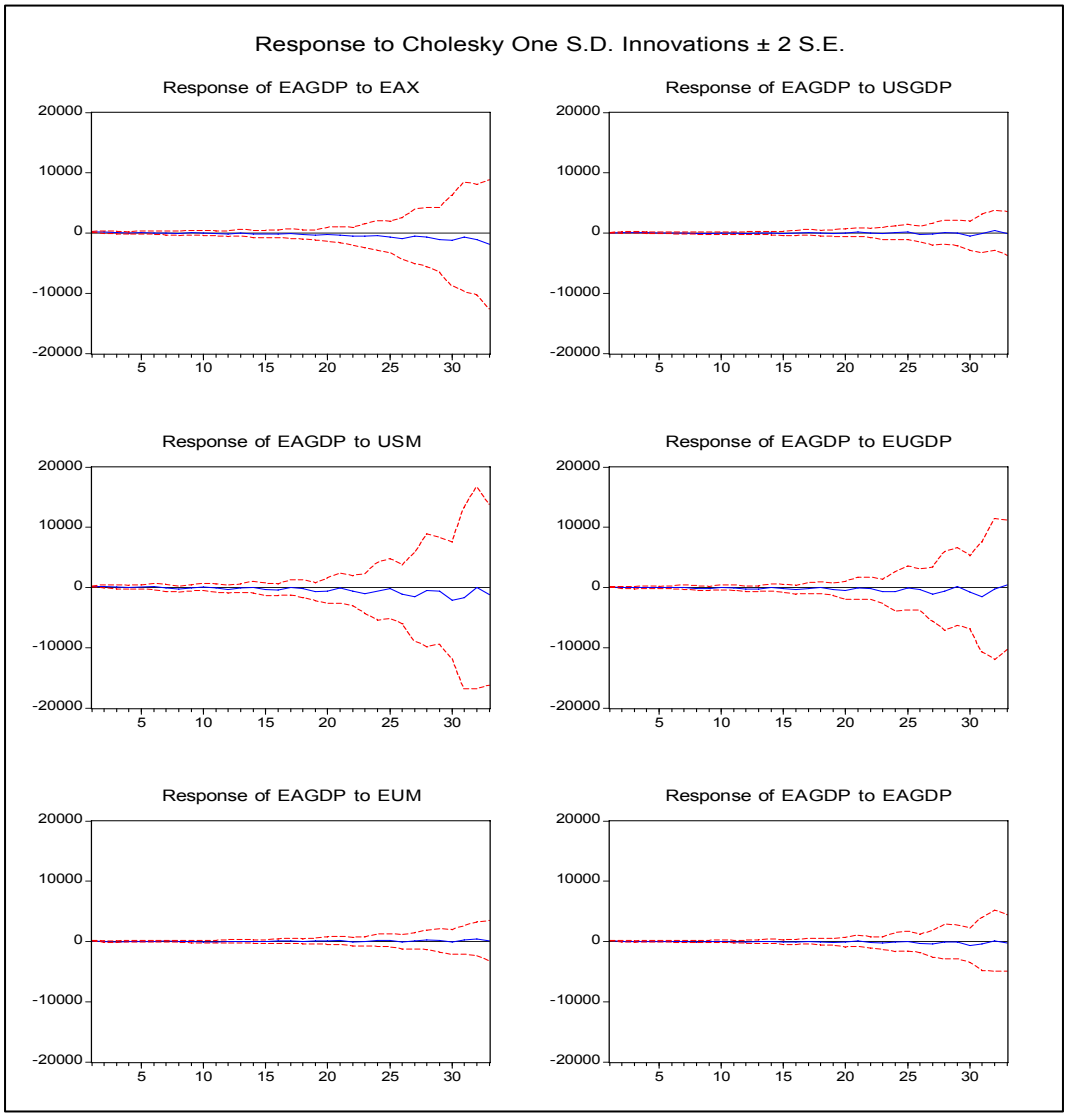
Most of the *EAGDP* variations are accounted mostly by domestic innovations coming from previous impacts of *EAX* and *USM*, explained by more than 30 percent after the first quarter. Comparatively, the disturbances in the *USM* have more explanatory power in accounting for variations in *EAGDP* than *EUM*. Meanwhile, the *USGDP* innovations are weaker than innovations in *EUGDP*. However, the variance decomposition shows that all variables have the first lag effect.

5 Impulse Responses

Results, at least qualitatively, are reflected in the impulse-response functions plotted. The response functions are plotted together with two standard deviation bands. Generally stated, if the bands do not encompass zero, then the responses are significantly different from zero. The results show that the shocks in *EAX* are mainly domestically generated. Indeed, domestic disturbances seem to be the major source of their *EAX* fluctuations specifically *EAX* itself. We may note that the response of *EAX* to one standard deviation shock in *USGDP*, *EUGDP*, *EUM*, and *EAGDP* is not significant for longer periods. Meanwhile, *EAX* reacts negatively and significantly to innovations in *EUGDP* in quarter 1 to 2. Thus, given the variance decomposition results, the effect of *EAX* is relatively more important than the other variables in accounting for fluctuation in *EAX*.



The results show that the variations in *EAGDP* are also domestically generated. Also, shocks coming from *USM*, *USGDP*, and *EUM* are significant at initial periods but the shocks become insignificant at latter periods.



APPENDIX 3: $ASEANGDP_t = f(USGDP_t, EUGDP_t, ASEANGDP_t, ASEANX_t, JAPGDP_t, KORGDP_t, PRCGDP_t)$

1 Optimal VAR Lag Selection

```
VAR system, maximum lag order 6

The asterisks below indicate the best (that is, minimized) valuesof the respective
information criteria, AIC = Akaike criterion, BIC = Schwartz Bayesian criterion and
HQC = Hannan-Quinn criterion.

lags        loglik    p(LR)       AIC          BIC          HQC

   1   -3108.75281           106.425094   109.357176   107.571992
   2   -3049.52870  0.00000  106.084290   110.726754   107.900213
   3   -2984.58206  0.00000  105.552735   111.905580   108.037682
   4   -2843.86258  0.00000  102.495419   110.558646   105.649391
   5   -2740.30435  0.00000  100.676812   110.450420   104.499807
   6   -2580.00556  0.00000   96.966852*  108.450841*  101.458871*
```

The optimal lag structure is 6 based from the lowest AIC and HQC (Gujarati, 2003). Hence, we have a VAR (6) model. Testing for further lags cannot anymore be implemented due to insufficiency of observations.

2 Johansen–Juselius Cointegration Test

```
Johansen test:
Number of equations = 7
Lag order = 6
Estimation period: 1993:2 - 2008:1 (T = 60)

Case 3: Unrestricted constant
Rank Eigenvalue Trace test p-value   Lmax test  p-value
   0    0.91407     426.47 [0.0000]     147.25 [0.0000]
   1    0.82902     279.22 [0.0000]     105.97 [0.0000]
   2    0.74745     173.24 [0.0000]     82.569 [0.0000]
   3    0.59761     90.674 [0.0000]     54.620 [0.0000]
   4    0.28988     36.054 [0.0076]     20.540 [0.0592]
   5    0.21570     15.515 [0.0481]     14.578 [0.0426]
   6   0.015493    0.93683 [0.3331]    0.93683 [0.3331]
```

Both the trace and λ-max tests rejected the null hypothesis that the smallest eigenvalue is 0 up to rank 5, so we may conclude that the series are in fact stationary (Enders, 2003). However, some linear combination may be I(d), since the trace and λ-max test accepted the hypothesis that the smallest eigenvalue is 0 in rank 6. The rejection of the hypothesis denotes the number of cointegrating equations, in this case, is at most 8. Since there is cointegration, OLS estimates of the structural relationships have the property of consistency (Mulligan, 2003).

3 VAR Estimation Results

```
VAR system, lag order 6
OLS estimates, observations 1993:2-2008:1 (T = 60)
Log-likelihood = -2761.4055
Determinant of covariance matrix = 2.2290434e+031
AIC = 102.0802
BIC = 112.5868
HQC = 106.1899
```

```
Portmanteau test: LB(15) = 905.385 (df = 441, p-value 0.000000)

Equation 1: aseangdp

               coefficient      std. error     t-ratio   p-value
  ------------------------------------------------------------------
  const        366454           163321          2.244    0.0385  **
  aseangdp_1     0.310124         0.241025      1.287    0.2154
  aseangdp_2    -0.165193         0.231730     -0.7129   0.4856
  aseangdp_3    -0.0853306        0.238014     -0.3585   0.7244
  aseangdp_4     0.0785419        0.230706      0.3404   0.7377
  aseangdp_5    -0.0783268        0.241598     -0.3242   0.7497
  aseangdp_6    -0.0922898        0.202211     -0.4564   0.6539
  usgdp_1       19.8895          15.0633        1.320    0.2042
  usgdp_2      -13.3892          17.8967       -0.7481   0.4646
  usgdp_3      -22.3184          20.9754       -1.064    0.3022
  usgdp_4       30.7825          20.1242        1.530    0.1445
  usgdp_5      -12.7605          20.8226       -0.6128   0.5481
  usgdp_6      -41.0133          22.7779       -1.801    0.0895  *
  eugdp_1      -27.9371         119.043        -0.2347   0.8173
  eugdp_2      153.216          103.964         1.474    0.1588
  eugdp_3       69.4362         116.840         0.5943   0.5601
  eugdp_4      -19.6155         118.749        -0.1652   0.8707
  eugdp_5       29.6566         125.564         0.2362   0.8161
  eugdp_6       37.4988         119.181         0.3146   0.7569
  prcgdp_1       8.89506         14.8980        0.5971   0.5583
  prcgdp_2      11.3269          16.1460        0.7015   0.4925
  prcgdp_3      22.7866           8.77693       2.596    0.0188  **
  prcgdp_4      28.1709           8.54094       3.298    0.0042  ***
  prcgdp_5      20.9698          16.9421        1.238    0.2326
  prcgdp_6      20.1267          19.2524        1.045    0.3105
  aseanx_1      -0.0757765        0.195041     -0.3885   0.7025
  aseanx_2       0.174864         0.261535      0.6686   0.5127
  aseanx_3      -0.0388850        0.254399     -0.1529   0.8803
  aseanx_4       0.215406         0.221588      0.9721   0.3446
  aseanx_5       0.298176         0.224027      1.331    0.2008
  aseanx_6      -0.338839         0.179974     -1.883    0.0770  *
  japgdp_1      -0.188683         0.204836     -0.9211   0.3699
  japgdp_2      -0.0854761        0.210025     -0.4070   0.6891
  japgdp_3      -0.147437         0.200669     -0.7347   0.4725
  japgdp_4      -0.152934         0.212956     -0.7181   0.4824
  japgdp_5      -0.0539248        0.204323     -0.2639   0.7950
  japgdp_6      -0.107431         0.196619     -0.5464   0.5919
  korgdp_1       0.536424         0.266187      2.015    0.0600  *
  korgdp_2      -0.635290         0.309073     -2.055    0.0555  *
  korgdp_3       0.394639         0.309252      1.276    0.2191
  korgdp_4       0.253784         0.300402      0.8448   0.4099
  korgdp_5      -0.533687         0.321527     -1.660    0.1153
  korgdp_6       0.585381         0.281859      2.077    0.0533  *

  Mean of dependent variable = 38361.2
  Standard deviation of dep. var. = 24454.7
  Sum of squared residuals = 1.16318e+008
  Standard error of the regression = 2615.77
  Unadjusted R-squared = 0.99670
  F-statistic (42, 17) = 122.376 (p-value < 0.00001)
  Durbin-Watson statistic = 2.60536
  First-order autocorrelation coeff. = -0.315432

  F-tests of zero restrictions:

  All lags of aseangdp           F(6, 17) =  0.63939, p-value 0.6976
  All lags of usgdp              F(6, 17) =   3.2339, p-value 0.0263
```

```
  All lags of eugdp              F(6, 17) =   1.0891, p-value 0.4078
  All lags of prcgdp             F(6, 17) =   4.2531, p-value 0.0085
  All lags of aseanx             F(6, 17) =   1.9826, p-value 0.1249
  All lags of japgdp             F(6, 17) =   1.7738, p-value 0.1646
  All lags of korgdp             F(6, 17) =   2.0516, p-value 0.1141
  All vars, lag 6                F(7, 17) =   1.4589, p-value 0.2468

Equation 2: aseanx

                coefficient      std. error     t-ratio   p-value
  ------------------------------------------------------------------
  const       140670           251995          0.5582    0.5840
  aseangdp_1       0.0879459         0.371887   0.2365    0.8159
  aseangdp_2      -0.325234          0.357547  -0.9096    0.3757
  aseangdp_3       0.372225          0.367243   1.014     0.3250
  aseangdp_4      -0.205666          0.355966  -0.5778    0.5710
  aseangdp_5       0.187789          0.372772   0.5038    0.6209
  aseangdp_6      -0.182062          0.312000  -0.5835    0.5672
  usgdp_1         44.4393           23.2419     1.912     0.0729  *
  usgdp_2         -0.871387         27.6135    -0.03156   0.9752
  usgdp_3        -20.2965           32.3638    -0.6271    0.5389
  usgdp_4         15.4817           31.0505     0.4986    0.6245
  usgdp_5        -36.0009           32.1281    -1.121     0.2781
  usgdp_6        -17.1720           35.1450    -0.4886    0.6314
  eugdp_1       -212.760           183.677     -1.158     0.2627
  eugdp_2        269.755           160.411      1.682     0.1109
  eugdp_3        -41.8992          180.278     -0.2324    0.8190
  eugdp_4        222.778           183.223      1.216     0.2406
  eugdp_5        -67.1716          193.738     -0.3467    0.7331
  eugdp_6        -46.9909          183.889     -0.2555    0.8014
  prcgdp_1         5.47601          22.9868     0.2382    0.8146
  prcgdp_2        20.7623           24.9123     0.8334    0.4162
  prcgdp_3         8.22276          13.5423     0.6072    0.5517
  prcgdp_4        13.4261           13.1782     1.019     0.3226
  prcgdp_5        -7.13451          26.1407    -0.2729    0.7882
  prcgdp_6        -0.315616         29.7053    -0.01062   0.9916
  aseanx_1         0.498262          0.300936   1.656     0.1161
  aseanx_2         0.328561          0.403533   0.8142    0.4268
  aseanx_3        -0.000817789       0.392524  -0.002083  0.9984
  aseanx_4        -0.192207          0.341897  -0.5622    0.5813
  aseanx_5         0.605235          0.345660   1.751     0.0980  *
  aseanx_6        -0.163858          0.277689  -0.5901    0.5629
  japgdp_1        -0.335087          0.316049  -1.060     0.3039
  japgdp_2         0.0595402         0.324056   0.1837    0.8564
  japgdp_3        -0.284042          0.309621  -0.9174    0.3718
  japgdp_4        -0.204393          0.328579  -0.6221    0.5422
  japgdp_5         0.0886920         0.315259   0.2813    0.7819
  japgdp_6         0.346106          0.303371   1.141     0.2697
  korgdp_1         0.862824          0.410712   2.101     0.0509  *
  korgdp_2        -0.673461          0.476881  -1.412     0.1759
  korgdp_3         0.291098          0.477158   0.6101    0.5499
  korgdp_4         0.0895879         0.463503   0.1933    0.8490
  korgdp_5        -0.504693          0.496097  -1.017     0.3233
  korgdp_6        -0.0657227         0.434893  -0.1511    0.8817

  Mean of dependent variable = 113216
  Standard deviation of dep. var. = 47363.2
  Sum of squared residuals = 2.76915e+008
  Standard error of the regression = 4035.98
  Unadjusted R-squared = 0.99791
  F-statistic (42, 17) = 193.053 (p-value < 0.00001)
  Durbin-Watson statistic = 2.00033
  First-order autocorrelation coeff. = -0.00606528
```

```
  F-tests of zero restrictions:

  All lags of aseangdp           F(6, 17) =  0.24713, p-value 0.9539
  All lags of usgdp              F(6, 17) =   1.4178, p-value 0.2646
  All lags of eugdp              F(6, 17) =  0.79317, p-value 0.5878
  All lags of prcgdp             F(6, 17) =  0.67516, p-value 0.6715
  All lags of aseanx             F(6, 17) =   6.1748, p-value 0.0014
  All lags of japgdp             F(6, 17) =   1.1765, p-value 0.3641
  All lags of korgdp             F(6, 17) =   1.3820, p-value 0.2776
  All vars, lag 6                F(7, 17) =  0.37157, p-value 0.9064

For the system as a whole:

  Null hypothesis: the longest lag is 5
  Alternative hypothesis: the longest lag is 6
  Likelihood ratio test: Chi-square(49) = 174.737 (p-value 0.000000)

  Comparison of information criteria:
  Lag order 6: AIC = 102.080, BIC = 112.587, HQC = 106.190
  Lag order 5: AIC = 103.359, BIC = 112.155, HQC = 106.800
```

Conventional inference is valid even when the structural variables are nonstationary, provided the residuals are white-noise processes with no serial correlation. It is generally assumed that adding a sufficient number of lagged difference terms in the disequilibrium adjustment process is always sufficient to guarantee white-noise errors (Mulligan, 2003; Gujarati, 2003).

From Equation 1, it can be seen from the results that *USGDP* is significant in positively influencing *ASEANGDP* specifically on the seventh and eighth lag. However, the influence of USM is negatively significant in influencing *ASEANGDP*. On the other hand, EUGDP and EUM are positively significant in influencing *ASEANGDP* specifically on the the fifth and eighth lag respectively. Japan and Korea also have their own respective shocks to ASEANGDP specifically their GDPs and Imports. Likewise, the first lag of *ASEANGDP* has its own influence to the contemporaneous value of *ASEANGDP*. EUM is the only variable that is insignificant in influencing *ASEANGDP*. From the results, it can be implied that Asian variables are more influential to *ASEANGDP* compared with US and EU variables; however, US variables are more significant in influencing *ASEANGDP* compared to EU variables.

From Equation 2, it can be seen that *USGDP* and *KORGDP* has a significant first lag effect on *ASEANX* while ASEANX is significant at the fifth lag.

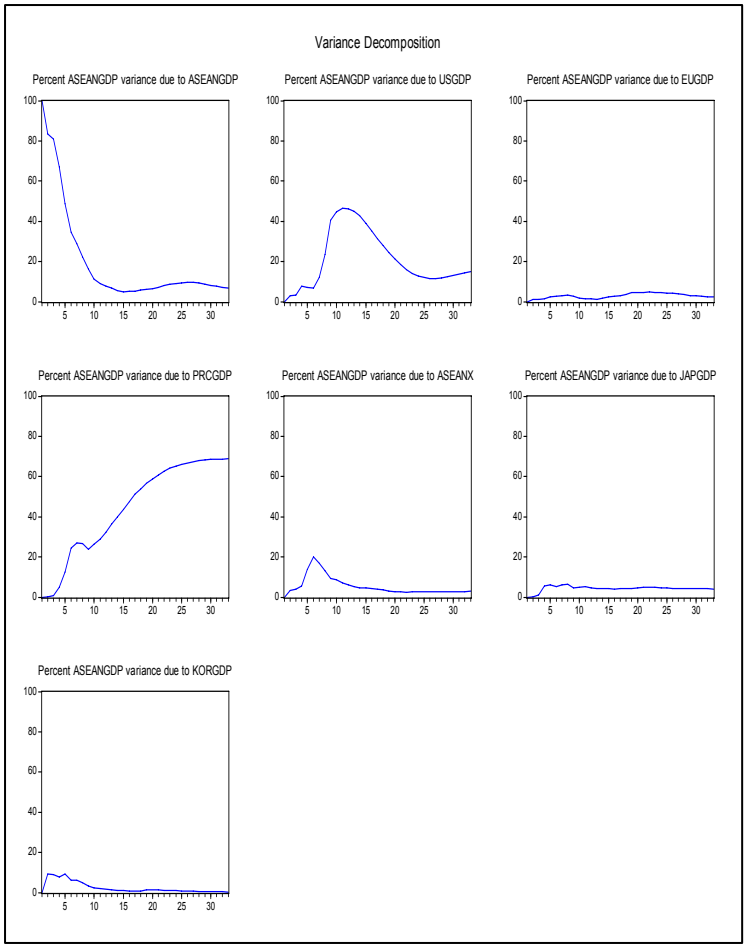
4 Variance Decomposition

```
Decomposition of variance for aseangdp

period     std. error   aseangdp      usgdp      eugdp     prcgdp

   1          1392.35   100.0000     0.0000     0.0000     0.0000
   2           1640.5    83.3097     2.9469     1.0871     0.0084
   3          1702.69    80.7818     3.3353     1.1917     0.7182
   4          1873.55    67.0907     7.7277     1.4156     4.8845
   5          2234.82    48.7220     7.2312     2.3947    12.5758
   6          2725.48    34.5741     6.6564     2.7975    24.6033
   7          2981.14    28.9789    12.0144     2.9417    26.9715
   8          3457.02    22.2765    23.5662     3.1556    26.7547
   9          4230.29    16.0939    40.5331     2.6121    23.6601
  10           5129.8    11.2205    44.5540     1.8352    26.1906
  11          5778.64     9.1244    46.5116     1.4563    28.7581
```

12	6325.11	7.6538	46.1829	1.3173	32.4448
13	6899.23	6.6623	44.9268	1.1340	36.5023
14	7548.89	5.6086	42.8669	1.6906	39.9421
15	8212.93	5.0200	38.9411	2.4778	43.8139
16	8884.49	5.1692	35.2203	2.7428	47.5194
17	9572.4	5.3028	31.4455	2.9978	51.2772
18	10496.2	5.7093	27.9820	3.7625	53.8788
19	11648.5	6.0751	24.3148	4.4425	56.6289
20	12897.6	6.4680	21.2836	4.6657	58.8432
21	14332.9	7.1190	18.5184	4.6850	60.8671
22	16022.7	8.0434	16.0169	4.7860	62.6103
23	17849.4	8.6155	13.9791	4.6506	64.1877
24	19916.5	9.0638	12.7463	4.4498	65.1807
25	22419.3	9.4591	12.0561	4.1941	66.1111
26	25501.7	9.6380	11.6303	4.1252	66.7500
27	28841.1	9.5851	11.3705	3.8849	67.4282
28	32595.8	9.2314	11.6927	3.4761	67.9900
29	37032.5	8.7052	12.4089	3.1040	68.3900
30	42435.5	8.1668	13.1803	2.9630	68.4594
31	48471.5	7.6448	13.7654	2.7834	68.5782
32	55213.7	7.1808	14.3594	2.5228	68.7028
33	62856.1	6.7515	14.9271	2.2786	68.8176

Decomposition of variance for aseangdp (continued)

period	aseanx	japgdp	korgdp
1	0.0000	0.0000	0.0000
2	3.3590	0.0515	9.2374
3	3.8306	1.0234	9.1190
4	5.4315	5.6060	7.8441
5	13.6345	6.1792	9.2626
6	20.0544	5.0664	6.2478
7	16.8433	6.2308	6.0194
8	13.1356	6.3680	4.7435
9	9.3601	4.4814	3.2594
10	8.8110	4.9208	2.4680
11	6.9782	5.1514	2.0202
12	6.0228	4.6903	1.6882
13	5.0777	4.2744	1.4226
14	4.4246	4.2790	1.1883
15	4.5071	4.2346	1.0055
16	4.3579	4.0704	0.9201
17	3.9963	4.1541	0.8262
18	3.6261	4.1035	0.9378
19	3.0389	4.2292	1.2705
20	2.6848	4.7271	1.3275
21	2.6713	4.8505	1.2887
22	2.4838	4.8261	1.2336
23	2.5323	4.8493	1.1854
24	2.7884	4.7194	1.0517
25	2.7494	4.5158	0.9144
26	2.6433	4.4000	0.8132
27	2.6256	4.3853	0.7204
28	2.6489	4.3342	0.6267
29	2.6218	4.2329	0.5373
30	2.5966	4.1733	0.4606
31	2.6956	4.1358	0.3967
32	2.7728	4.1238	0.3376
33	2.8534	4.0884	0.2834



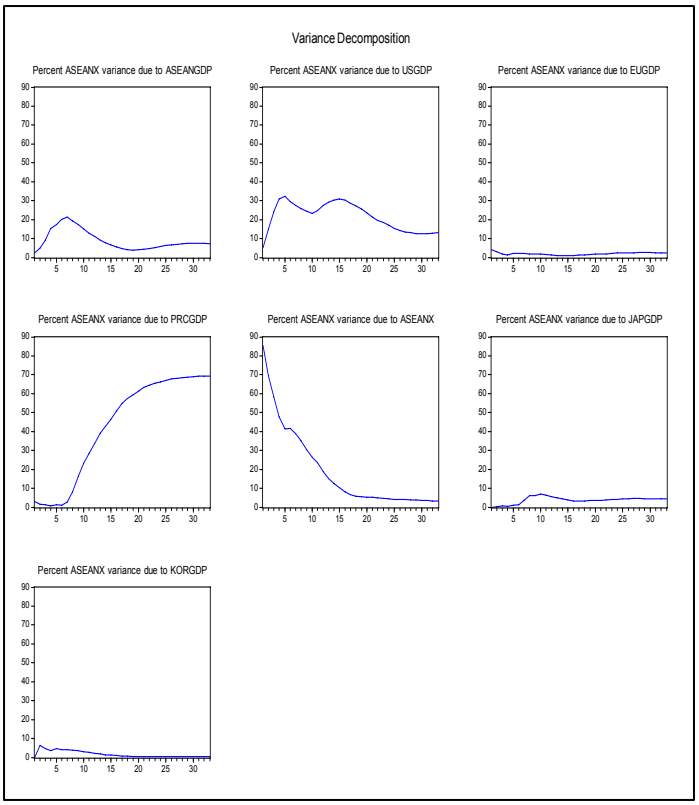
Most of the *ASEANGDP* variations are accounted mostly by domestic innovations coming from previous impacts of *ASEANGDP*, explained by more than 65 percent after the first quarter and roughly about 10 to 40 percent at succeeding horizon. Comparatively, the disturbances in *USGDP, JAPGDP* and *KORGDP* have more explanatory power in accounting for variations in *ASEANGDP* than *EUGDP*. Roughly about 20 percent of the forecast error variance of *ASEANGDP* is attributed to shocks in *JAPGDP* at latter horizons while *USGDP* innovations explain 40 percent of the variation in *ASEANGDP* from 9 to 20 quarter period. Note that the influences of *JAPM* are not immediate. After 41 quarters, approximately 12 percent of the variance in *ASEANGDP* has been attributable to variation in *USM*, over the period studied.

Decomposition of variance for aseanx

period	std. error	aseangdp	usgdp	eugdp	prcgdp
1	2148.31	2.3265	5.2407	4.0507	3.0224
2	3149.55	4.8902	14.7845	2.9418	1.4386
3	3968.67	9.2885	24.2383	1.9237	1.1473
4	4870	15.2820	30.8873	1.2891	0.7758
5	5527.4	17.4081	32.2594	2.1693	1.1310
6	5816.46	20.1741	29.5175	2.0644	1.0931
7	6030.49	21.2838	27.6037	2.0204	2.7898
8	6393.43	19.3458	25.6883	1.9435	8.1000
9	6898.19	17.3089	24.4467	1.7401	16.3165
10	7408.26	15.2038	23.1901	1.8206	23.3199
11	8090.63	12.8951	24.6237	1.5326	28.2661
12	9089.7	11.0146	27.5796	1.3492	33.8342
13	10157.4	9.0745	29.1672	1.0861	39.1473
14	11208.6	7.6415	30.3416	0.9321	42.8391
15	12413.6	6.5594	30.8184	0.8851	46.5163
16	14134.7	5.5092	30.2009	1.0694	50.8249
17	15965.3	4.7185	28.5829	1.2690	54.8245
18	17802.9	4.1546	27.2191	1.3586	57.4135
19	19883.6	3.8915	25.6171	1.4721	59.4211
20	22293.2	4.1332	23.4699	1.7497	61.3959
21	24946.4	4.4099	21.3106	1.8615	63.2163
22	27870.5	4.7810	19.7239	1.9483	64.4842
23	31287.7	5.1021	18.3675	2.0165	65.5145
24	35580.4	5.6709	16.9293	2.2987	66.1401
25	40411	6.3036	15.3208	2.4472	67.0378
26	45637.5	6.7051	14.1372	2.4204	67.7468
27	51680.5	6.9548	13.4345	2.3888	68.2065
28	59157.6	7.2166	13.0586	2.5419	68.4195
29	67860.2	7.3987	12.6816	2.6753	68.6987
30	77381	7.4801	12.4873	2.6523	68.9600
31	88058.3	7.4252	12.5954	2.5112	69.1958
32	100852	7.3506	12.9238	2.4812	69.2307
33	115657	7.2246	13.1801	2.4955	69.2911

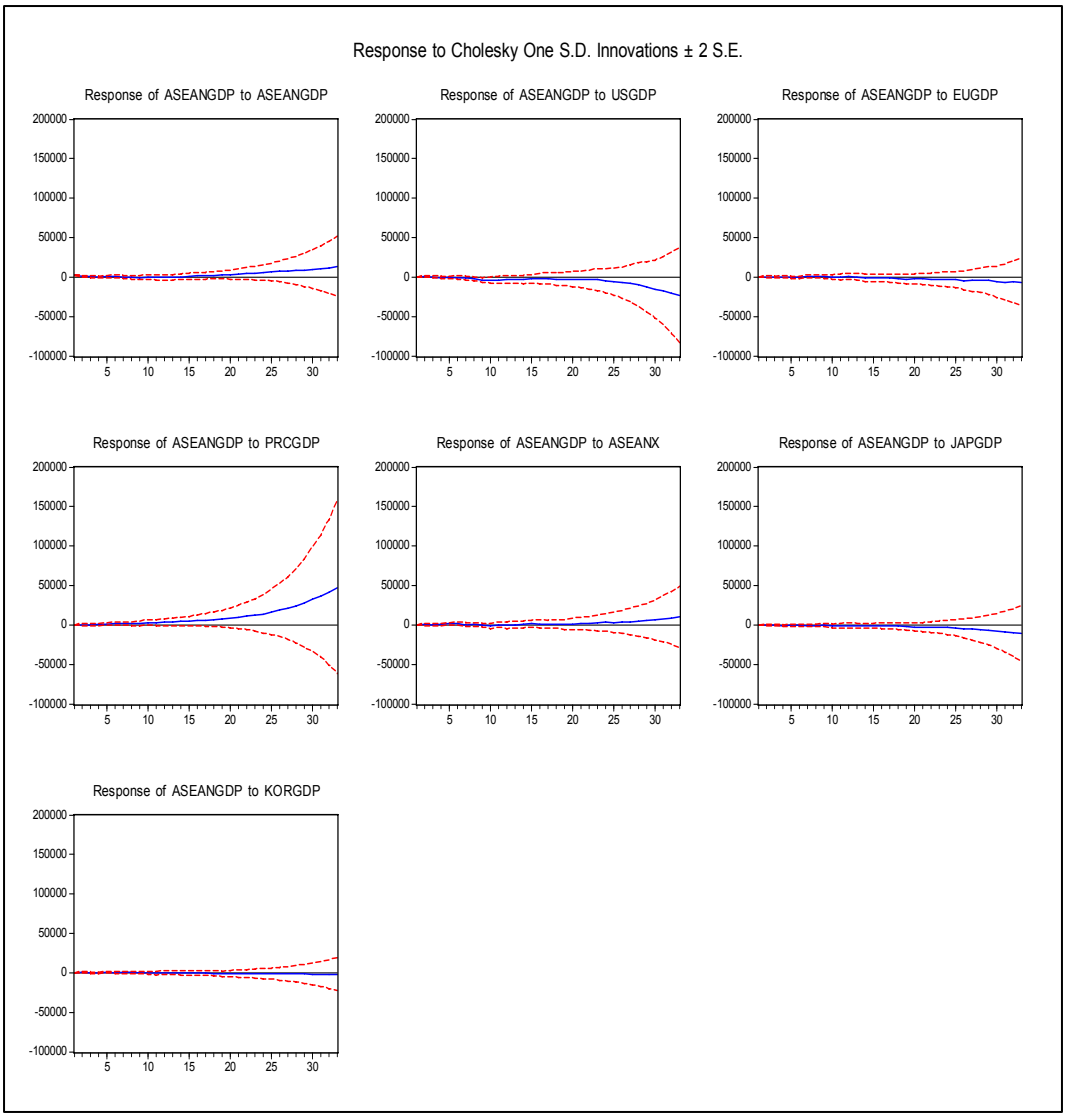
Decomposition of variance for aseanx (continued)

period	aseanx	japgdp	korgdp
1	85.3597	0.0000	0.0000
2	69.4600	0.0011	6.4838
3	58.2536	0.5831	4.5655
4	47.7063	0.4642	3.5953
5	41.3806	1.0419	4.6097
6	41.6988	1.2380	4.2141
7	38.8359	3.4760	3.9905
8	35.0654	6.1673	3.6897
9	30.4613	6.1788	3.5477
10	26.4634	6.9231	3.0791
11	23.6293	6.4668	2.5864
12	18.7549	5.4054	2.0621
13	15.0273	4.7970	1.7006
14	12.5711	4.2711	1.4035
15	10.2697	3.8056	1.1455
16	8.0169	3.3675	1.0110
17	6.5951	3.2000	0.8101
18	5.8912	3.3115	0.6515
19	5.6230	3.4329	0.5423
20	5.1803	3.6149	0.4562
21	5.1882	3.6215	0.3921
22	5.0195	3.6772	0.3658
23	4.6730	3.9641	0.3622
24	4.3964	4.1742	0.3904
25	4.1559	4.3404	0.3942
26	4.0994	4.5031	0.3879
27	4.0798	4.5537	0.3820
28	3.8697	4.5158	0.3780
29	3.7017	4.4679	0.3762
30	3.5873	4.4713	0.3617
31	3.4768	4.4531	0.3424
32	3.3058	4.3750	0.3330
33	3.1707	4.3159	0.3221

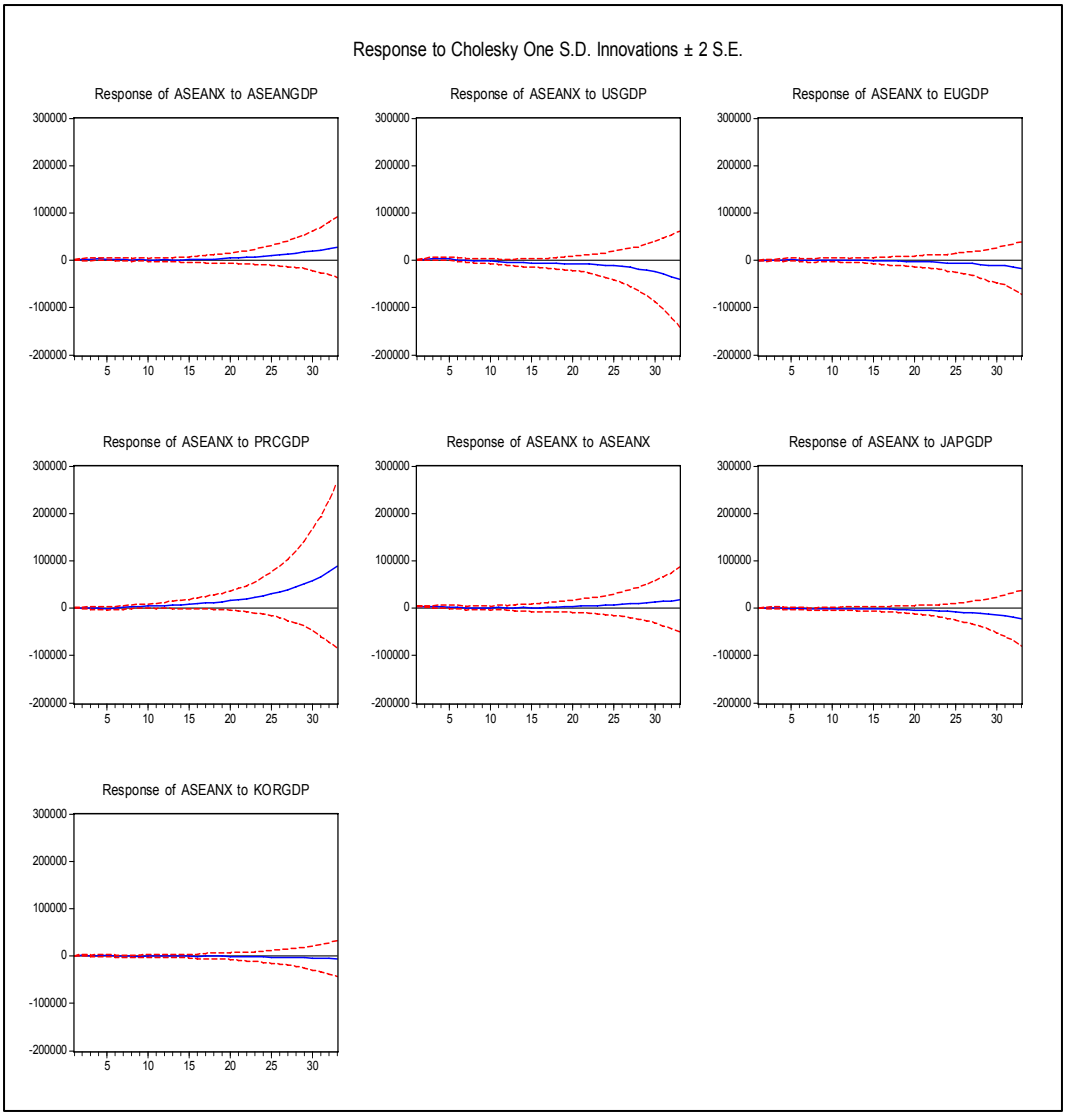


Most of the *ASEANX* variations are accounted mostly innovations coming from *ASEANX* itself. Innovations also come from *USGDP* and *PRCGDP*, explained by more than 30 percent and 50 percent after the 4-quarter and 16-quarter period respectively. Comparatively, the disturbances in *USGDP, JAPGDP*, and *EUGDP* have more explanatory power in accounting for variations in *ASEANGDP* than *KORGDP*.

5 Impulse Responses



Results, at least qualitatively, are reflected in the impulse-response functions plotted. The response functions are plotted together with two standard deviation bands. Generally stated, if the bands do not encompass zero, then the responses are significantly different from zero. The results show that the variations in *ASEANGDP* are mainly domestically generated. Indeed, domestic disturbances seem to be the major source of the *ASEANGDP* fluctuations specifically *ASEANGDP* itself. We may note that the responses of *ASEANGDP* to one standard deviation shock in foreign variables are not significant. Meanwhile, *ASEANGDP* reacts stable to innovations in *JAPGDP* and *KORGDP* for 20 quarters. Thus, given the variance decomposition results, the effect of Asian variables are relatively more important than non-Asian variables in accounting for fluctuations in *ASEANGDP*.



The results show that shocks in *ASEANX* coming from ASEANGDP, USGDP, PRCGDP, and ASEANX itself are significant. Indeed, disturbances from major trading partners seem to be the major source of the *ASEANX* fluctuations.

APPENDIX 4: $ASEANGDP_t = f(USM_t, EUM_t, ASEANGDP_t, ASEANX_t, JAPM_t, KORM_t, PRCM_t)$

1 Optimal VAR Lag Selection

```
VAR system, maximum lag order 6

The asterisks below indicate the best (that is, minimized) values of the respective
information criteria, AIC = Akaike criterion, BIC = Schwartz Bayesian criterion and
HQC = Hannan-Quinn criterion.

lags        loglik    p(LR)       AIC          BIC          HQC

   1   -4016.56290           136.685430   139.617512*  137.832329
   2   -3969.73804  0.00013  136.757935   141.400398   138.573857
   3   -3914.95095  0.00000  136.565032   142.917877   139.049979
   4   -3839.46979  0.00000  135.682326   143.745553   138.836297
   5   -3745.03344  0.00000  134.167781   143.941389   137.990777
   6   -3574.49610  0.00000  130.116537*  141.600526   134.608556*
```

The optimal lag structure is 6 based from the lowest AIC and HQC (Gujarati, 2003). Hence, we have a VAR (6) model. Testing for further lags cannot anymore be implemented due to insufficiency of observations.

2 Johansen–Juselius Cointegration Test

```
Johansen test:
Number of equations = 7
Lag order = 6
Estimation period: 1993:2 - 2008:1 (T = 60)

Case 3: Unrestricted constant
Rank Eigenvalue Trace test p-value   Lmax test  p-value
   0    0.94580     415.84 [0.0000]     174.91 [0.0000]
   1    0.73543     240.93 [0.0000]     79.779 [0.0000]
   2    0.62031     161.15 [0.0000]     58.104 [0.0000]
   3    0.53176     103.05 [0.0000]     45.526 [0.0000]
   4    0.49347     57.522 [0.0000]     40.810 [0.0000]
   5    0.24183     16.712 [0.0309]     16.611 [0.0189]
   6  0.0016915    0.10158 [0.7499]    0.10158 [0.7500]
```

Both the trace and λ-max tests rejected the null hypothesis that the smallest eigenvalue is 0 up to rank 5, so we may conclude that the series are in fact stationary (Enders, 2003). However, some linear combination may be I(d), since the trace and λ-max test accepted the hypothesis that the smallest eigenvalue is 0 in rank 6. The rejection of the hypothesis denotes the number of cointegrating equations, in this case, is at most 8. Since there is cointegration, OLS estimates of the structural relationships have the property of consistency (Mulligan, 2003).

3 VAR Estimation Results

```
VAR system, lag order 6
OLS estimates, observations 1993:2-2008:1 (T = 60)
Log-likelihood = -3701.7824
Determinant of covariance matrix = 9.151006e+044
AIC = 133.4261
BIC = 143.9327
HQC = 137.5358
```

```
Portmanteau test: LB(15) = 903.692 (df = 441, p-value 0.000000)

Equation 1: aseangdp

               coefficient      std. error     t-ratio   p-value
  ------------------------------------------------------------------
  const       31776.2          19662.1          1.616    0.1245
  aseangdp_1      0.213896         0.290751      0.7357   0.4720
  aseangdp_2      0.0616386        0.295641      0.2085   0.8373
  aseangdp_3     -0.109014         0.292128     -0.3732   0.7136
  aseangdp_4     -0.0246783        0.311457     -0.07924  0.9378
  aseangdp_5     -0.287182         0.293462     -0.9786   0.3415
  aseangdp_6     -0.0898237        0.256888     -0.3497   0.7309
  aseanx_1       -0.517017         0.343384     -1.506    0.1505
  aseanx_2       -0.0562476        0.321372     -0.1750   0.8631
  aseanx_3        0.0308317        0.311310      0.09904  0.9223
  aseanx_4        0.317469         0.268614      1.182    0.2535
  aseanx_5        0.312590         0.277016      1.128    0.2748
  aseanx_6        0.196499         0.327794      0.5995   0.5568
  usm_1           0.212310         0.134181      1.582    0.1320
  usm_2          -0.0855471        0.195844     -0.4368   0.6677
  usm_3           0.101059         0.208706      0.4842   0.6344
  usm_4          -0.296300         0.211996     -1.398    0.1802
  usm_5          -0.332807         0.254900     -1.306    0.2091
  usm_6           0.244005         0.176474      1.383    0.1847
  eum_1          -0.000157665      0.000128157  -1.230    0.2354
  eum_2           4.97912E-05      0.000129832   0.3835   0.7061
  eum_3           0.000186320      0.000156325   1.192    0.2497
  eum_4          -7.04245E-05      0.000145116  -0.4853   0.6337
  eum_5          -7.53721E-05      0.000112722  -0.6687   0.5127
  eum_6          -7.95070E-05      9.53409E-05  -0.8339   0.4159
  prcm_1          0.288647         0.179450      1.609    0.1261
  prcm_2          0.108124         0.205856      0.5252   0.6062
  prcm_3          0.184481         0.167405      1.102    0.2858
  prcm_4          0.176096         0.169632      1.038    0.3138
  prcm_5          0.0381946        0.167393      0.2282   0.8222
  prcm_6         -0.201809         0.165981     -1.216    0.2407
  korm_1         -0.194233         0.557043     -0.3487   0.7316
  korm_2          0.388566         0.489994      0.7930   0.4387
  korm_3         -0.620219         0.576140     -1.077    0.2967
  korm_4          0.402702         0.515617      0.7810   0.4455
  korm_5         -0.0628331        0.623882     -0.1007   0.9210
  korm_6          0.246241         0.627359      0.3925   0.6996
  japm_1        264.741          443.399         0.5971   0.5583
  japm_2        274.139          477.439         0.5742   0.5734
  japm_3       -182.265          471.877        -0.3863   0.7041
  japm_4        246.669          533.019         0.4628   0.6494
  japm_5       -143.121          476.346        -0.3005   0.7675
  japm_6       -382.074          444.962        -0.8587   0.4025

  Mean of dependent variable = 38361.2
  Standard deviation of dep. var. = 24454.7
  Sum of squared residuals = 2.08412e+008
  Standard error of the regression = 3501.36
  Unadjusted R-squared = 0.99409
  F-statistic (42, 17) = 68.1213 (p-value < 0.00001)
  Durbin-Watson statistic = 2.1231
  First-order autocorrelation coeff. = -0.103141

  F-tests of zero restrictions:

  All lags of aseangdp           F(6, 17) =  0.84091, p-value 0.5556
  All lags of aseanx             F(6, 17) =  0.81205, p-value 0.5750
```

```
  All lags of usm                F(6, 17) =   1.2010, p-value 0.3526
  All lags of eum                F(6, 17) =  0.97928, p-value 0.4689
  All lags of prcm               F(6, 17) =   1.2809, p-value 0.3174
  All lags of korm               F(6, 17) =  0.25240, p-value 0.9516
  All lags of japm               F(6, 17) =  0.37284, p-value 0.8862
  All vars, lag 6                F(7, 17) =  0.56724, p-value 0.7724

Equation 2: aseanx

               coefficient      std. error     t-ratio   p-value
  ------------------------------------------------------------
  const       24136.3          16177.2          1.492    0.1540
  aseangdp_1     -0.208850         0.239218     -0.8731   0.3948
  aseangdp_2     -0.481266         0.243242     -1.979    0.0643  *
  aseangdp_3      0.335567         0.240352      1.396    0.1806
  aseangdp_4     -0.0249564        0.256254     -0.09739  0.9236
  aseangdp_5     -0.0570643        0.241449     -0.2363   0.8160
  aseangdp_6     -0.292115         0.211358     -1.382    0.1848
  aseanx_1        0.188251         0.282523      0.6663   0.5141
  aseanx_2       -0.275460         0.264412     -1.042    0.3121
  aseanx_3        0.302272         0.256134      1.180    0.2542
  aseanx_4        0.154075         0.221005      0.6972   0.4951
  aseanx_5        0.432577         0.227918      1.898    0.0748  *
  aseanx_6        0.305173         0.269696      1.132    0.2735
  usm_1           0.528958         0.110399      4.791    0.0002  ***
  usm_2          -0.320009         0.161132     -1.986    0.0634  *
  usm_3          -0.311730         0.171715     -1.815    0.0871  *
  usm_4          -0.242742         0.174422     -1.392    0.1820
  usm_5           0.171558         0.209722      0.8180   0.4247
  usm_6           0.0513808        0.145196      0.3539   0.7278
  eum_1           1.97984E-06      0.000105443   0.01878  0.9852
  eum_2           0.000255643      0.000106821   2.393    0.0285  **
  eum_3          -0.000273621      0.000128618  -2.127    0.0483  **
  eum_4           9.12389E-05      0.000119396   0.7642   0.4552
  eum_5          -6.78348E-05      9.27432E-05  -0.7314   0.4745
  eum_6           0.000100363      7.84427E-05   1.279    0.2179
  prcm_1         -0.359735         0.147645     -2.436    0.0261  **
  prcm_2          0.233846         0.169370      1.381    0.1853
  prcm_3          0.466308         0.137734      3.386    0.0035  ***
  prcm_4          0.137342         0.139566      0.9841   0.3389
  prcm_5          0.116890         0.137725      0.8487   0.4078
  prcm_6         -0.148466         0.136563     -1.087    0.2921
  korm_1          0.117503         0.458312      0.2564   0.8007
  korm_2          0.214797         0.403148      0.5328   0.6011
  korm_3         -0.184475         0.474025     -0.3892   0.7020
  korm_4         -0.924740         0.424229     -2.180    0.0436  **
  korm_5          0.238959         0.513306      0.4655   0.6475
  korm_6          1.02653          0.516166      1.989    0.0631  *
  japm_1       -255.919          364.811        -0.7015   0.4925
  japm_2        528.849          392.818         1.346    0.1959
  japm_3       1012.94           388.242         2.609    0.0183  **
  japm_4         24.5214         438.547         0.05592  0.9561
  japm_5      -1247.14           391.919        -3.182    0.0055  ***
  japm_6       -595.190          366.097        -1.626    0.1224

  Mean of dependent variable = 113216
  Standard deviation of dep. var. = 47363.2
  Sum of squared residuals = 1.41081e+008
  Standard error of the regression = 2880.78
  Unadjusted R-squared = 0.99893
  F-statistic (42, 17) = 379.316 (p-value < 0.00001)
  Durbin-Watson statistic = 1.9101
  First-order autocorrelation coeff. = 0.0359564
```

```
  F-tests of zero restrictions:

  All lags of aseangdp           F(6, 17) =   1.4378, p-value 0.2577
  All lags of aseanx             F(6, 17) =   3.5980, p-value 0.0173
  All lags of usm                F(6, 17) =   5.9955, p-value 0.0016
  All lags of eum                F(6, 17) =   1.2367, p-value 0.3364
  All lags of prcm               F(6, 17) =   4.5380, p-value 0.0064
  All lags of korm               F(6, 17) =   2.1226, p-value 0.1039
  All lags of japm               F(6, 17) =   2.9995, p-value 0.0347
  All vars, lag 6                F(7, 17) =   1.6879, p-value 0.1785

For the system as a whole:

  Null hypothesis: the longest lag is 5
  Alternative hypothesis: the longest lag is 6
  Likelihood ratio test: Chi-square(49) = 237.147 (p-value 0.000000)

  Comparison of information criteria:
  Lag order 6: AIC = 133.426, BIC = 143.933, HQC = 137.536
  Lag order 5: AIC = 135.745, BIC = 144.541, HQC = 139.186
```

Conventional inference is valid even when the structural variables are nonstationary, provided the residuals are white-noise processes with no serial correlation. It is generally assumed that adding a sufficient number of lagged difference terms in the disequilibrium adjustment process is always sufficient to guarantee white-noise errors (Mulligan, 2003; Gujarati, 2003).

From Equation 1, it can be seen from the results that no variables are significant in influencing *ASEANGDP* but from Equation 2, it can be seen that the imports of Japan, China, US, and EU has a significant influence on *ASEANX*.

4 Variance Decomposition

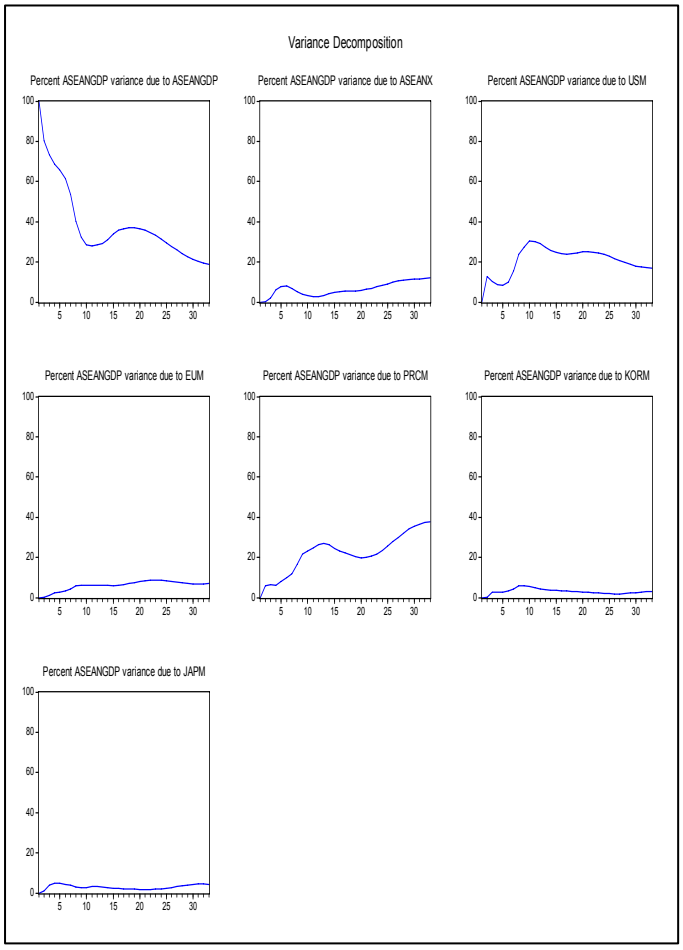
Decomposition of variance for aseangdp

period	std. error	aseangdp	aseanx	usm	eum
1	1863.74	100.0000	0.0000	0.0000	0.0000
2	2299.41	80.2033	0.0116	12.7602	0.0065
3	2576.97	73.3014	2.0057	10.3536	1.0334
4	2791.64	68.6644	6.2553	8.8254	2.4256
5	2887.32	65.8932	7.6544	8.3715	2.5856
6	3018.37	61.3053	8.0028	9.8220	3.2069
7	3313	53.3299	6.9244	15.7246	4.3756
8	3876.36	40.3381	5.2048	23.6912	5.7791
9	4474.48	32.2746	4.0971	27.2338	6.1382
10	4928.68	28.6745	3.3788	30.3533	6.1616
11	5416.01	27.9991	2.8359	30.1758	6.0536
12	5950.21	28.4000	2.6624	29.0551	6.0599
13	6426.97	29.1462	3.2041	27.2217	6.1920
14	6839.26	31.0673	4.3364	25.8131	6.0060
15	7246.42	33.8974	4.8135	24.8972	5.9248
16	7598.16	35.8157	5.3008	24.1134	6.0581
17	7906.73	36.5800	5.5175	23.9051	6.4624
18	8229.12	37.0637	5.5190	24.0553	7.0054
19	8549.46	37.0641	5.6292	24.5194	7.5457
20	8856.73	36.5496	5.9628	25.0047	8.0265
21	9134.73	35.7612	6.3629	25.1088	8.4117
22	9451.76	34.6768	6.9004	24.8195	8.7368
23	9808.38	33.1265	7.7505	24.3787	8.7807

24	10175.2	31.3621	8.3858	23.9488	8.6702
25	10572.2	29.4845	9.1192	22.9641	8.4669
26	11034.1	27.6543	10.0684	21.6790	8.1435
27	11541.9	26.0167	10.5543	20.7813	7.7868
28	12126.2	24.2199	10.7362	19.8088	7.4550
29	12789.4	22.4914	11.1525	18.6723	7.1626
30	13490.8	21.2592	11.5895	17.8141	6.9368
31	14241.6	20.3736	11.6664	17.3944	6.8218
32	15074.8	19.4562	11.7482	17.1774	6.9162
33	15962.6	18.7861	12.1098	16.9069	7.1248

Decomposition of variance for aseangdp (continued)

period	prcm	korm	japm
1	0.0000	0.0000	0.0000
2	5.8576	0.0060	1.1548
3	6.4818	2.7448	4.0794
4	6.1363	2.7773	4.9156
5	8.0416	2.6706	4.7830
6	9.9560	3.3133	4.3937
7	11.7097	4.1439	3.7919
8	16.4318	5.7050	2.8500
9	21.4996	5.9208	2.8360
10	23.2305	5.4068	2.7946
11	24.9139	4.8251	3.1965
12	26.2142	4.2756	3.3328
13	27.1216	3.9905	3.1239
14	26.3276	3.6910	2.7587
15	24.4805	3.5284	2.4582
16	23.0827	3.3922	2.2370
17	22.1504	3.2235	2.1609
18	21.1649	3.0602	2.1314
19	20.3324	2.9165	1.9927
20	19.8271	2.7619	1.8675
21	19.9501	2.6132	1.7921
22	20.5518	2.4836	1.8311
23	21.7292	2.3063	1.9282
24	23.3977	2.1479	2.0875
25	25.5938	1.9917	2.3799
26	27.8335	1.8474	2.7739
27	29.8106	1.8410	3.2094
28	32.1070	2.0193	3.6537
29	34.2596	2.2477	4.0139
30	35.5737	2.4975	4.3292
31	36.4317	2.7470	4.5650
32	37.2272	2.9714	4.5032
33	37.8460	2.9954	4.2311



Most of the *ASEANGDP* variations are accounted mostly *PRCM* and *USM*. Following next are the variations from *EUM*, *JAPM*, and *KORM*. Note that *PRCM* causes more variation in *ASEANGDP* than *USM*.

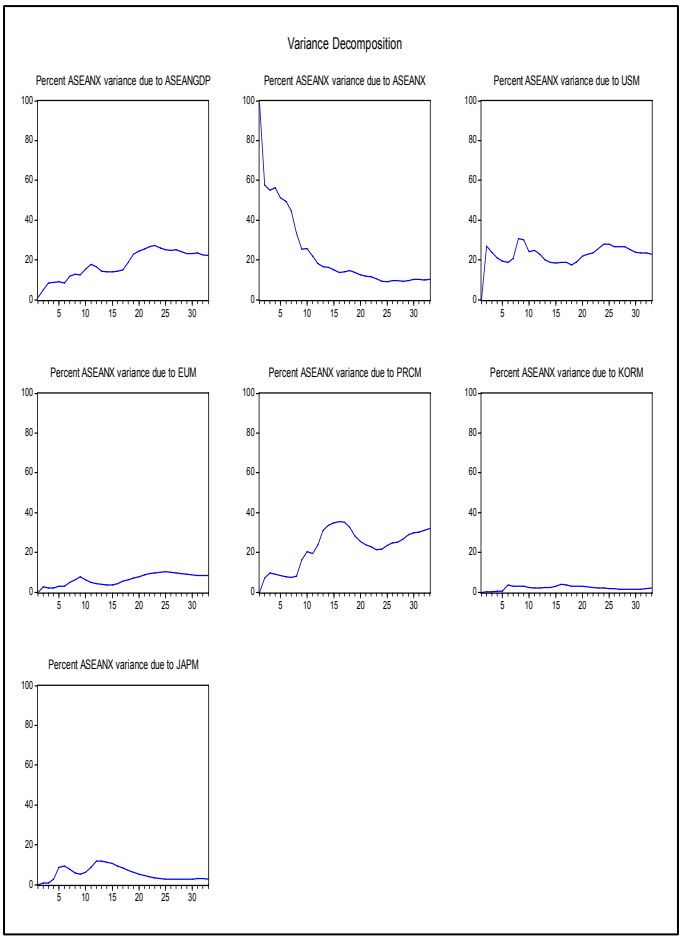
Decomposition of variance for aseanx

period	std. error	aseangdp	aseanx	usm	eum
1	1533.41	1.1518	98.8482	0.0000	0.0000
2	2733.61	4.8291	57.6028	27.0742	2.6832
3	3152.17	8.4813	55.1759	23.7284	2.0250
4	3388.45	8.7407	56.2903	20.9496	2.1244
5	3566.78	8.9968	51.3305	19.3410	2.8688

6	3696.84	8.4534	49.3867	18.8284	3.0333
7	4036.83	11.7104	44.5191	20.7951	4.8822
8	4665.17	12.6819	33.3351	30.7005	6.2300
9	5398.88	12.5452	25.5457	30.0871	7.5869
10	6104.53	15.2819	25.7403	24.2092	6.0570
11	6814.18	17.8391	21.9948	24.8436	5.0320
12	7576.89	16.6177	18.2898	22.9300	4.2079
13	8309.78	14.4530	16.4829	19.8882	3.9117
14	8795.72	13.8812	16.0907	18.8450	3.6914
15	9357.76	14.0791	14.9327	18.5098	3.7172
16	10048.4	14.3178	13.8204	18.8720	4.3124
17	10774	14.9026	14.1723	18.6220	5.4403
18	11596.6	18.6730	14.5131	17.6545	6.0843
19	12760.3	22.8439	13.7297	19.0100	6.9955
20	13965.7	24.3081	12.6135	21.7982	7.7460
21	15058	25.2514	11.8189	22.9326	8.7462
22	16176.3	26.7177	11.4009	23.4252	9.3342
23	17548.4	27.1613	10.4680	25.8490	9.6524
24	18937.3	26.1511	9.3131	28.0295	9.8522
25	20272.3	25.0583	9.0547	27.8236	10.1489
26	21671.8	24.8460	9.6446	26.6727	9.9013
27	23227.8	24.9924	9.5089	26.6981	9.5086
28	24868.8	24.1473	9.1495	26.5470	9.1928
29	26529.1	23.2195	9.7236	25.0342	8.9526
30	28175.1	23.2520	10.3029	23.7593	8.5809
31	30009.8	23.4042	10.1581	23.5309	8.3340
32	31995.9	22.6927	9.8963	23.4161	8.2460
33	33983.9	22.1065	10.1582	22.7360	8.3575

Decomposition of variance for aseanx (continued)

period	prcm	korm	japm
1	0.0000	0.0000	0.0000
2	7.0256	0.0215	0.7635
3	9.6772	0.0223	0.8900
4	8.8414	0.3334	2.7201
5	8.2222	0.4420	8.7988
6	7.6549	3.4753	9.1681
7	7.4135	2.9901	7.6897
8	8.0298	3.1529	5.8698
9	16.1147	2.8510	5.2694
10	20.2923	2.2990	6.1203
11	19.5332	1.9903	8.7670
12	23.8525	2.1290	11.9731
13	31.0964	2.4394	11.7285
14	33.6964	2.4921	11.3032
15	34.9257	3.1119	10.7235
16	35.4829	3.8048	9.3896
17	35.0503	3.5620	8.2507
18	32.7398	3.1197	7.2156
19	28.3241	3.0778	6.0190
20	25.3153	3.0518	5.1669
21	23.9279	2.7510	4.5721
22	22.7604	2.3997	3.9619
23	21.2752	2.1980	3.3962
24	21.6452	2.0580	2.9509
25	23.4085	1.8055	2.7004
26	24.6799	1.5809	2.6748
27	25.0839	1.4588	2.7493
28	26.7292	1.4478	2.7862
29	28.9111	1.4008	2.7582
30	29.9251	1.3543	2.8254

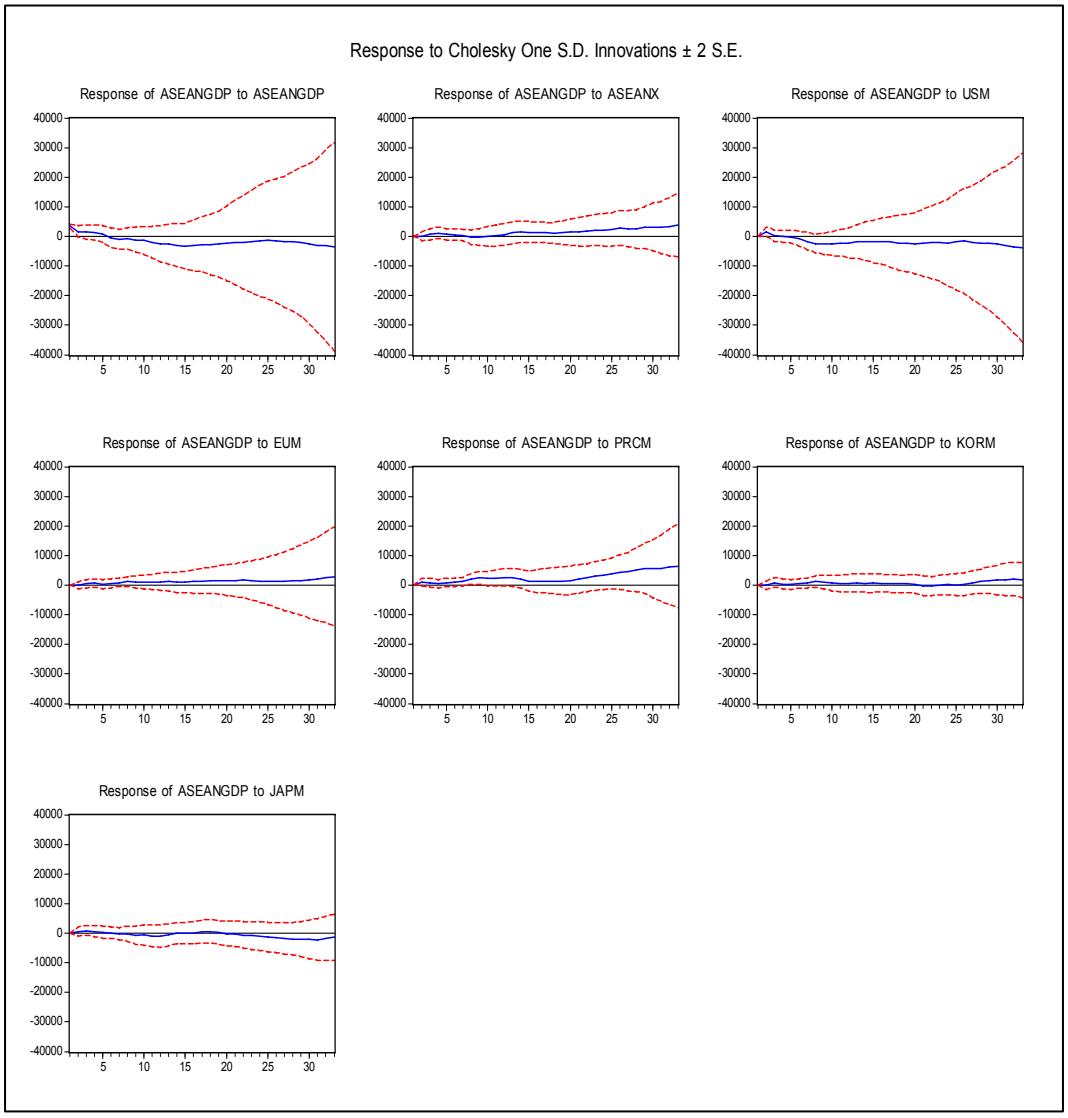


31	30.0524	1.5708	2.9497
32	31.0079	1.8904	2.8505
33	31.9954	1.9581	2.6883

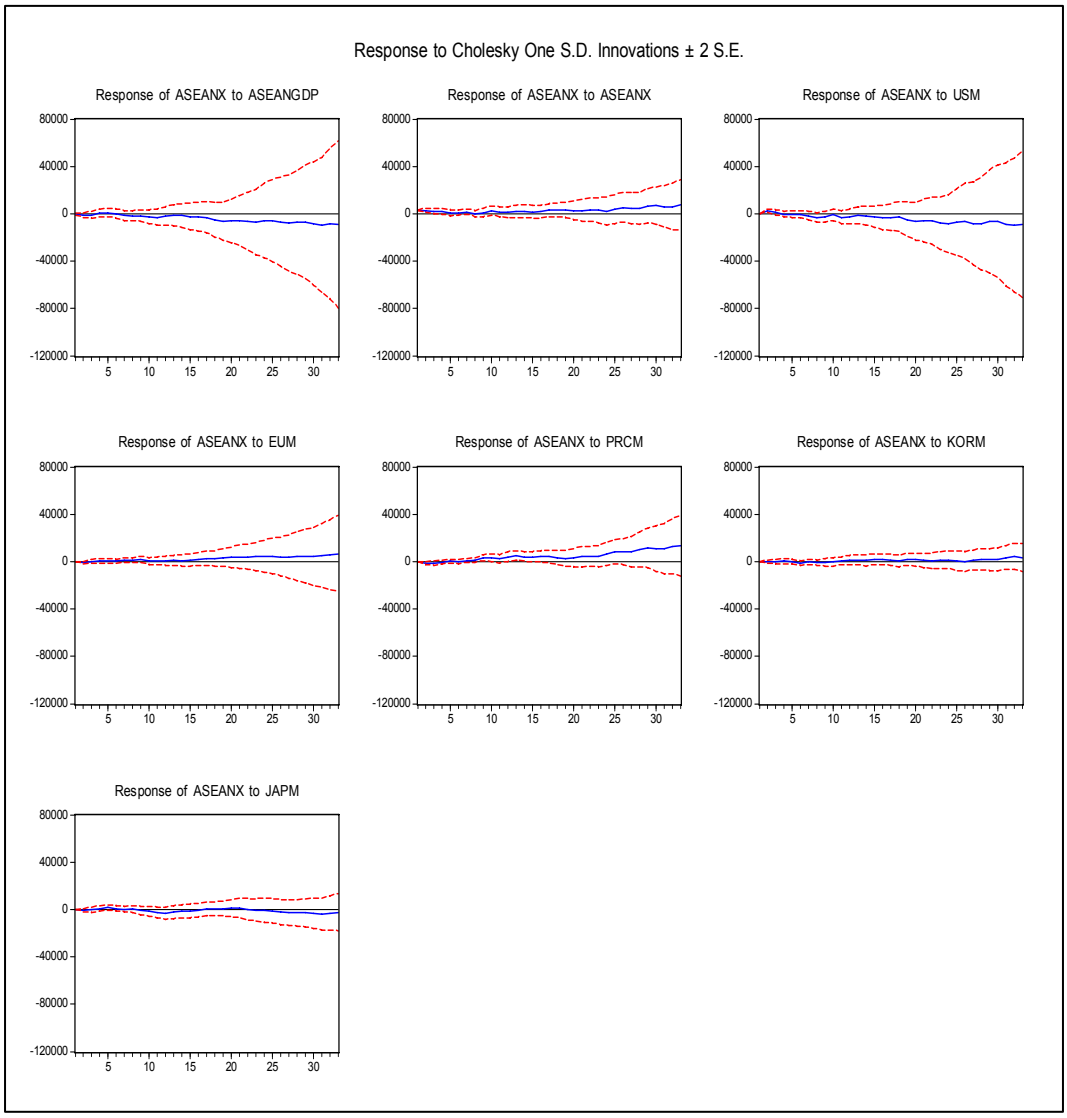
Most of the *ASEANX* variations are accounted mostly innovations coming from *PRCM, USM, ASEANGDP,* and *ASEANX* itself. Variations coming from *PRCM* are more powerful than *USM*. Comparatively, the disturbances in *EUM* have more explanatory power than *JAPM* and *KORM*.

5 Impulse Responses

Results, at least qualitatively, are reflected in the impulse-response functions plotted. The response functions are plotted together with two standard deviation bands. Generally stated, if the bands do not encompass zero, then the responses are significantly different from zero. The results show that the shocks in *ASEANGDP* due to ASEANGDP, USM, EUM, and PRCM are significant. The interaction of ASEAN to major trading partners cause shocks to the region as a whole. PRCM has the longest significant shocks to ASEANGDP compared to other regions/countries.



The results show that shocks in *ASEANX* coming from *USM*, *PRCM*, *USM*, *EUM* and *ASEANX* itself are significant. Indeed, disturbances from major trading partners seem to be the major source of the *ASEANX* fluctuations.



APPENDIX 5: *ASEANGDP$_t$ = f(EAGDP$_t$, EAX$_t$, EANINF$_t$, EANEER$_t$, USGDP$_t$, EUGDP$_t$, PRCGDP$_t$)*

1 Optimal VAR Lag Selection

```
VAR system, maximum lag order 6

The asterisks below indicate the best (that is, minimized) values of the respective
information criteria, AIC = Akaike criterion, BIC = Schwartz Bayesian criterion and
HQC = Hannan-Quinn criterion.

lags        loglik    p(LR)       AIC          BIC          HQC

   1   -2677.80989            92.726996    96.357194    94.146966
   2   -2603.76561  0.00000   92.392187    98.256352    94.685984
   3   -2501.05459  0.00000   91.101820    99.199952    94.269444
   4   -2334.92986  0.00000   87.697662    98.029762    91.739114
   5   -2193.71547  0.00000   85.123849    97.689916    90.039129
   6    -762.29913  0.00000   39.543304*   54.343339*   45.332412*
```

The optimal lag structure is 6 based from the lowest AIC and HQC (Gujarati, 2003). Hence, we have a VAR (6) model. Testing for further lags cannot anymore be implemented due to insufficiency of observations.

2 Johansen–Juselius Cointegration Test

```
Johansen test:
Number of equations = 8
Lag order = 6
Estimation period: 1993:2 - 2008:1 (T = 60)

Case 3: Unrestricted constant
Rank Eigenvalue Trace test p-value   Lmax test  p-value
   0    0.98707     693.29 [0.0000]     260.88 [0.0000]
   1    0.92458     432.41 [0.0000]     155.08 [0.0000]
   2    0.76272     277.33 [0.0000]     86.311 [0.0000]
   3    0.69747     191.02 [0.0000]     71.734 [0.0000]
   4    0.65543     119.28 [0.0000]     63.928 [0.0000]
   5    0.43286     55.355 [0.0000]     34.029 [0.0002]
   6    0.27366     21.326 [0.0050]     19.184 [0.0064]
   7   0.035072     2.1421 [0.1433]     2.1421 [0.1433]
```

Both the trace and λ-max tests rejected the null hypothesis that the smallest eigenvalue is 0 up to rank 6, so we may conclude that the series are in fact stationary (Enders, 2003). However, some linear combination may be I(d), since the trace and λ-max test accepted the hypothesis that the smallest eigenvalue is 0 in rank 7. The rejection of the hypothesis denotes the number of cointegrating equations, in this case, is at most 8. Since there is cointegration, OLS estimates of the structural relationships have the property of consistency (Mulligan, 2003).

3 VAR Estimation Results

```
VAR system, lag order 6
OLS estimates, observations 1993:2-2008:1 (T = 60)
Log-likelihood = -2002.7693
Determinant of covariance matrix = 1.3591266e+019
AIC = 79.8256
BIC = 93.5087
HQC = 85.1778
```

```
Portmanteau test: LB(15) = 1588.95 (df = 576, p-value 0.000000)

Equation 1: aseangdp

               coefficient      std. error     t-ratio    p-value
  ------------------------------------------------------------------
  const        -96470.2         83051.6         -1.162     0.2700
  aseangdp_1        0.926162        0.339094     2.731     0.0195  **
  aseangdp_2        0.221490        0.293471     0.7547    0.4663
  aseangdp_3       -0.0188127       0.319477    -0.05889   0.9541
  aseangdp_4       -0.486489        0.334569    -1.454     0.1739
  aseangdp_5        0.573996        0.353290     1.625     0.1325
  aseangdp_6        0.0184286       0.363224     0.05074   0.9604
  eax_1            -0.0217988       0.0872318   -0.2499    0.8073
  eax_2            -0.0351846       0.110182    -0.3193    0.7555
  eax_3             0.172695        0.125226     1.379     0.1953
  eax_4             0.139294        0.119016     1.170     0.2666
  eax_5            -0.439260        0.144351    -3.043     0.0112  **
  eax_6             0.244540        0.159340     1.535     0.1531
  eaneer_1        391.367         496.658        0.7880    0.4473
  eaneer_2        236.856         584.005        0.4056    0.6928
  eaneer_3        575.455         591.469        0.9729    0.3515
  eaneer_4       -419.798         629.445       -0.6669    0.5186
  eaneer_5         23.6792        451.700        0.05242   0.9591
  eaneer_6       -432.307         455.280       -0.9495    0.3627
  eainf_1         -76.1328        406.986       -0.1871    0.8550
  eainf_2        -748.071         510.334       -1.466     0.1707
  eainf_3        -199.232         809.594       -0.2461    0.8101
  eainf_4        -127.336         447.966       -0.2843    0.7815
  eainf_5         249.149         578.407        0.4308    0.6750
  eainf_6         -78.8385        617.068       -0.1278    0.9006
  usgdp_1         -30.7271         23.2111      -1.324     0.2124
  usgdp_2          25.8818         27.0182       0.9579    0.3587
  usgdp_3          -5.59305        30.2031      -0.1852    0.8565
  usgdp_4          -6.62571        37.7714      -0.1754    0.8639
  usgdp_5         -49.3844         33.6187      -1.469     0.1699
  usgdp_6          42.9617         33.6620       1.276     0.2281
  eugdp_1        -332.649         152.326       -2.184     0.0515  *
  eugdp_2          96.8143        136.329        0.7101    0.4924
  eugdp_3         209.367          99.3262       2.108     0.0588  *
  eugdp_4        -199.724         155.208       -1.287     0.2246
  eugdp_5         635.927         248.483        2.559     0.0266  **
  eugdp_6        -124.634         146.007       -0.8536    0.4115
  eagdp_1           3.48715         5.06036      0.6891    0.5050
  eagdp_2          -2.65613         4.65581     -0.5705    0.5798
  eagdp_3           0.118695        4.81652      0.02464   0.9808
  eagdp_4          -3.34682         4.91000     -0.6816    0.5096
  eagdp_5          -0.106565        5.82547     -0.01829   0.9857
  eagdp_6           4.69631         6.16784      0.7614    0.4624
  prcgdp_1        -54.9066         29.4892       -1.862     0.0895  *
  prcgdp_2        -11.9488         41.9024       -0.2852    0.7808
  prcgdp_3          1.72625        17.4315       0.09903   0.9229
  prcgdp_4         19.3027         17.5674       1.099     0.2953
  prcgdp_5         81.0838         28.1474       2.881     0.0150  **
  prcgdp_6         12.1573         44.1427       0.2754    0.7881

  Mean of dependent variable = 38361.2
  Standard deviation of dep. var. = 24454.7
  Sum of squared residuals = 9.6438e+007
  Standard error of the regression = 2960.93
  Unadjusted R-squared = 0.99727
  F-statistic (48, 11) = 83.6167 (p-value < 0.00001)
  Durbin-Watson statistic = 2.18071
```

```
  First-order autocorrelation coeff. = -0.0945382

  F-tests of zero restrictions:

  All lags of aseangdp           F(6, 11) =   4.3201, p-value 0.0175
  All lags of eax                F(6, 11) =   2.6599, p-value 0.0760
  All lags of eaneer             F(6, 11) =  0.77707, p-value 0.6045
  All lags of eainf              F(6, 11) =  0.46906, p-value 0.8177
  All lags of usgdp              F(6, 11) =   1.4289, p-value 0.2874
  All lags of eugdp              F(6, 11) =   2.0082, p-value 0.1498
  All lags of eagdp              F(6, 11) =  0.54681, p-value 0.7632
  All lags of prcgdp             F(6, 11) =   2.3889, p-value 0.1000
  All vars, lag 6                F(8, 11) =  0.77190, p-value 0.6352

Equation 2: eax

               coefficient      std. error     t-ratio    p-value
  ------------------------------------------------------------------
  const        -81673.9         222100          -0.3677    0.7200
  aseangdp_1        1.67357          0.906819     1.846     0.0920  *
  aseangdp_2        0.0324211        0.784813     0.04131   0.9678
  aseangdp_3        0.0329571        0.854358     0.03858   0.9699
  aseangdp_4       -1.69745          0.894718    -1.897     0.0844  *
  aseangdp_5        1.44058          0.944782     1.525     0.1555
  aseangdp_6       -0.425368         0.971349    -0.4379    0.6699
  eax_1             0.464182         0.233279     1.990     0.0720  *
  eax_2            -0.0977637        0.294652    -0.3318    0.7463
  eax_3             0.332963         0.334885     0.9943    0.3415
  eax_4            -0.247964         0.318276    -0.7791    0.4524
  eax_5            -0.942801         0.386030    -2.442     0.0327  **
  eax_6             1.21308          0.426113     2.847     0.0159  **
  eaneer_1        207.680          1328.18         0.1564    0.8786
  eaneer_2      -1444.85           1561.77        -0.9251    0.3747
  eaneer_3       3832.45           1581.73         2.423     0.0338  **
  eaneer_4      -4931.78           1683.29        -2.930     0.0137  **
  eaneer_5       -714.225          1207.95        -0.5913    0.5663
  eaneer_6      -1239.13           1217.53        -1.018     0.3307
  eainf_1         931.290          1088.38         0.8557    0.4104
  eainf_2       -1335.58           1364.76        -0.9786    0.3488
  eainf_3        -604.975          2165.05        -0.2794    0.7851
  eainf_4         506.250          1197.97         0.4226    0.6807
  eainf_5        1582.27           1546.80         1.023     0.3283
  eainf_6       -3726.08           1650.19        -2.258     0.0453  **
  usgdp_1         -57.7776           62.0721      -0.9308    0.3719
  usgdp_2         131.359            72.2532       1.818     0.0964  *
  usgdp_3           5.96253          80.7702       0.07382   0.9425
  usgdp_4        -178.624          101.010        -1.768     0.1047
  usgdp_5         -51.7200           89.9045      -0.5753    0.5767
  usgdp_6         179.806            90.0204       1.997     0.0711  *
  eugdp_1       -1204.37           407.356        -2.957     0.0131  **
  eugdp_2        1090.21           364.577         2.990     0.0123  **
  eugdp_3        -356.240          265.622        -1.341     0.2069
  eugdp_4         -60.9121         415.064        -0.1468    0.8860
  eugdp_5        1823.52           664.504         2.744     0.0191  **
  eugdp_6       -1527.85           390.457        -3.913     0.0024  ***
  eagdp_1          36.6965           13.5326       2.712     0.0202  **
  eagdp_2           4.83846          12.4507       0.3886    0.7050
  eagdp_3          15.7536           12.8805       1.223     0.2469
  eagdp_4          15.3882           13.1305       1.172     0.2660
  eagdp_5          32.8344           15.5787       2.108     0.0588  *
  eagdp_6          -9.41262          16.4943      -0.5707    0.5797
  prcgdp_1       -191.030            78.8612      -2.422     0.0339  **
  prcgdp_2        -88.4735          112.057       -0.7895    0.4465
```

```
  prcgdp_3         19.1569          46.6160      0.4110    0.6890
  prcgdp_4         59.2162          46.9795      1.260     0.2336
  prcgdp_5        146.233           75.2729      1.943     0.0781  *
  prcgdp_6         95.9417         118.048       0.8127    0.4336

  Mean of dependent variable = 438630
  Standard deviation of dep. var. = 199830
  Sum of squared residuals = 6.89681e+008
  Standard error of the regression = 7918.23
  Unadjusted R-squared = 0.99971
  F-statistic (48, 11) = 782.613 (p-value < 0.00001)
  Durbin-Watson statistic = 2.38654
  First-order autocorrelation coeff. = -0.200145

  F-tests of zero restrictions:

  All lags of aseangdp            F(6, 11) =   1.5014, p-value 0.2644
  All lags of eax                 F(6, 11) =   3.9609, p-value 0.0234
  All lags of eaneer              F(6, 11) =   2.0430, p-value 0.1443
  All lags of eainf               F(6, 11) =   1.6130, p-value 0.2327
  All lags of usgdp               F(6, 11) =   1.4934, p-value 0.2668
  All lags of eugdp               F(6, 11) =   3.4434, p-value 0.0364
  All lags of eagdp               F(6, 11) =   1.8924, p-value 0.1701
  All lags of prcgdp              F(6, 11) =   4.9598, p-value 0.0108
  All vars, lag 6                 F(8, 11) =   2.9430, p-value 0.0503

Equation 3: eagdp

               coefficient      std. error      t-ratio    p-value
  ------------------------------------------------------------------
  const        5877.72          6178.32          0.9513     0.3619
  aseangdp_1     -0.00727934       0.0252257    -0.2886     0.7783
  aseangdp_2      0.0214429        0.0218317     0.9822     0.3471
  aseangdp_3      0.00557192       0.0237663     0.2344     0.8189
  aseangdp_4      0.000706233      0.0248890     0.02838    0.9779
  aseangdp_5     -0.0376895        0.0262817    -1.434      0.1794
  aseangdp_6      0.0372863        0.0270207     1.380      0.1950
  eax_1          -0.000347532      0.00648929   -0.05355    0.9583
  eax_2           0.00364769       0.00819656    0.4450     0.6649
  eax_3          -0.00454809       0.00931575   -0.4882     0.6350
  eax_4           0.00333147       0.00885373    0.3763     0.7139
  eax_5           0.000790693      0.0107385     0.07363    0.9426
  eax_6           0.000560278      0.0118535     0.04727    0.9631
  eaneer_1      -67.8421          36.9470       -1.836      0.0935  *
  eaneer_2       27.0947          43.4449        0.6237     0.5456
  eaneer_3       55.9630          44.0001        1.272      0.2296
  eaneer_4       24.0522          46.8252        0.5137     0.6177
  eaneer_5      -10.7952          33.6026       -0.3213     0.7540
  eaneer_6       29.0978          33.8688        0.8591     0.4086
  eainf_1       -47.9798          30.2762       -1.585      0.1413
  eainf_2        30.3110          37.9644        0.7984     0.4415
  eainf_3       -47.0678          60.2268       -0.7815     0.4510
  eainf_4        47.2278          33.3248        1.417      0.1841
  eainf_5        28.4366          43.0285        0.6609     0.5223
  eainf_6       -79.7515          45.9045       -1.737      0.1102
  usgdp_1         0.708669         1.72670       0.4104     0.6894
  usgdp_2        -0.639726         2.00992      -0.3183     0.7562
  usgdp_3         1.90913          2.24685       0.8497     0.4136
  usgdp_4        -2.84013          2.80987      -1.011      0.3338
  usgdp_5         0.666358         2.50094       0.2664     0.7948
  usgdp_6        -0.696385         2.50416      -0.2781     0.7861
  eugdp_1        -5.91098         11.3317       -0.5216     0.6123
  eugdp_2         6.31459         10.1417        0.6226     0.5462
```

```
  eugdp_3        -2.67185          7.38901      -0.3616     0.7245
  eugdp_4        -0.0391849       11.5461       -0.003394   0.9974
  eugdp_5         5.50258         18.4850        0.2977     0.7715
  eugdp_6        -3.54409         10.8616       -0.3263     0.7503
  eagdp_1         0.993956         0.376447      2.640      0.0230  **
  eagdp_2        -0.317011         0.346352     -0.9153     0.3797
  eagdp_3         0.207579         0.358307      0.5793     0.5740
  eagdp_4        -0.611277         0.365262     -1.674      0.1224
  eagdp_5         0.214683         0.433364      0.4954     0.6301
  eagdp_6        -0.770390         0.458834     -1.679      0.1213
  prcgdp_1        1.39262          2.19374       0.6348     0.5385
  prcgdp_2       -3.68403          3.11717      -1.182      0.2622
  prcgdp_3        0.448098         1.29675       0.3456     0.7362
  prcgdp_4        2.22077          1.30686       1.699      0.1173
  prcgdp_5       -2.47233          2.09392      -1.181      0.2626
  prcgdp_6        5.82800          3.28384       1.775      0.1036

  Mean of dependent variable = 5657.52
  Standard deviation of dep. var. = 832.221
  Sum of squared residuals = 533694
  Standard error of the regression = 220.267
  Unadjusted R-squared = 0.98694
  F-statistic (48, 11) = 17.3172 (p-value < 0.00001)
  Durbin-Watson statistic = 2.01313
  First-order autocorrelation coeff. = -0.0174718

  F-tests of zero restrictions:

  All lags of aseangdp           F(6, 11) =  0.70149, p-value 0.6549
  All lags of eax                F(6, 11) = 0.097478, p-value 0.9952
  All lags of eaneer             F(6, 11) =   1.3664, p-value 0.3089
  All lags of eainf              F(6, 11) =   1.6054, p-value 0.2348
  All lags of usgdp              F(6, 11) =  0.88177, p-value 0.5388
  All lags of eugdp              F(6, 11) = 0.098892, p-value 0.9950
  All lags of eagdp              F(6, 11) =   2.2524, p-value 0.1153
  All lags of prcgdp             F(6, 11) =   2.8439, p-value 0.0634
  All vars, lag 6                F(8, 11) =   1.5677, p-value 0.2400

For the system as a whole:

  Null hypothesis: the longest lag is 5
  Alternative hypothesis: the longest lag is 6
  Likelihood ratio test: Chi-square(64) = 602.321 (p-value 0.000000)

  Comparison of information criteria:
  Lag order 6: AIC = 79.8256, BIC = 93.5087, HQC = 85.1778
  Lag order 5: AIC = 87.7310, BIC = 99.1801, HQC = 92.2094
```

From Equation 1, it can be seen from the results *EUGDP*, *PRCGDP*, *ASEANGDP*, and *EAX* are significant in influencing *ASEANGDP* at their respective lags. From Equation 2, the GDPs of *US*, *EU*, *PRC*, and *EA* are significant in influencing *EAX*. Also, inflation and nominal effective exchange rate in *EA* have significant influences on *EAX*. From Equation 3, only the first lag of EANEER and EAGDP are significant.

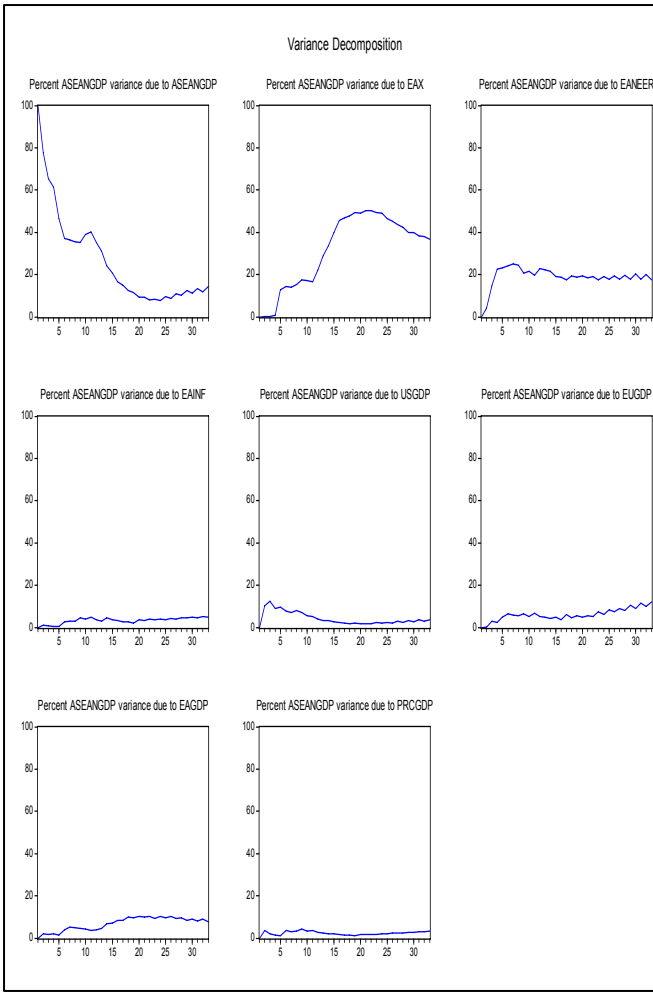
4 Variance Decomposition

```
Decomposition of variance for aseangdp

period     std. error   aseangdp        eax     eaneer      eainf

   1          1267.79   100.0000     0.0000     0.0000     0.0000
```

2	1709.78	77.7472	0.1474	4.3643	1.2316
3	2322.45	65.3731	0.1337	14.5169	0.7574
4	2807.68	61.3191	0.9227	22.4679	0.5835
5	3331.38	46.5315	12.6290	23.1062	0.5677
6	3822.83	37.1164	14.2140	24.0779	2.7918
7	4042.11	36.3376	14.0780	25.2147	3.1220
8	4237.6	35.4631	15.4127	24.3531	2.8520
9	4620.37	35.2831	17.3926	20.5421	4.6732
10	5170.77	38.8229	17.2625	21.5626	3.8190
11	6064.05	40.2323	16.4350	19.5632	4.7364
12	6878.21	35.0203	22.2125	22.9051	3.6816
13	7841.81	31.0693	28.7212	22.3242	2.8540
14	9066.61	24.2028	33.4747	21.5639	4.5298
15	10068.3	20.6669	39.8570	19.1710	3.6736
16	11501.5	16.4181	45.6659	18.6421	3.2876
17	13248.7	14.8635	46.7572	17.4340	2.6902
18	15093.2	12.5230	47.9255	19.3619	2.5599
19	16750.6	11.5390	49.3099	18.8513	2.0924
20	18834.1	9.3739	49.0718	19.2798	3.7003
21	20156.9	9.2282	50.1948	18.5261	3.2357
22	21985.4	7.9838	50.2136	19.1687	3.8839
23	24097.9	8.3903	49.3456	17.5463	3.7714
24	26838.8	7.6578	48.9061	19.1358	3.8257
25	29840.1	9.6183	46.6083	17.8552	3.6255
26	33434.9	8.8297	45.3021	19.5332	4.2889
27	37008	11.0307	43.5798	17.9626	3.8770
28	41596.1	10.2220	42.5086	19.8196	4.6592
29	46947.1	12.5658	39.9592	17.8605	4.4804
30	53403.3	11.3257	39.8204	20.2607	4.8189
31	60857.6	13.5282	38.1753	17.9725	4.5339
32	69799.3	11.9289	38.0232	19.9359	5.2200
33	79220.3	14.2313	36.5938	17.4770	4.9031

Decomposition of variance for aseangdp (continued)

period	usgdp	eugdp	eagdp	prcgdp
1	0.0000	0.0000	0.0000	0.0000
2	10.3690	0.2662	2.2079	3.6665
3	12.3866	3.0669	1.7775	1.9879
4	8.8489	2.3820	2.1054	1.3705
5	9.5480	4.9869	1.4983	1.1323
6	7.7550	6.5889	3.9847	3.4714
7	6.9816	5.9735	5.1601	3.1326
8	8.1577	5.4833	5.0090	3.2692
9	6.9804	6.5693	4.4437	4.1157
10	5.6019	5.3047	4.2435	3.3830
11	5.0941	6.6976	3.6104	3.6309
12	4.0668	5.3104	3.9800	2.8233
13	3.3777	4.7380	4.6203	2.2954
14	3.3105	4.2695	6.7094	1.9394
15	2.6885	4.9072	6.9979	2.0379
16	2.2142	3.7817	8.3968	1.5937
17	2.1477	6.0693	8.4757	1.5623
18	1.7078	4.6812	9.8175	1.4232
19	1.9834	5.4922	9.5037	1.2282
20	1.7236	5.0185	10.1411	1.6910
21	1.7547	5.5423	9.9247	1.5935
22	1.7631	5.0694	10.2335	1.6841
23	2.2539	7.4161	9.4189	1.8576
24	1.9066	6.2529	10.3475	1.9676
25	2.5083	8.2588	9.5324	1.9931
26	2.1587	7.3604	10.2442	2.2827
27	2.8594	9.1478	9.1998	2.3430
28	2.4761	8.1093	9.7244	2.4808
29	3.3159	10.7228	8.3408	2.7546
30	2.7446	9.1154	9.1425	2.7718
31	3.5426	11.3694	7.9699	2.9082
32	3.0447	9.8884	8.9838	2.9751
33	3.6812	12.1264	7.7638	3.2234



Most of the *ASEANGDP* variations are accounted mostly by domestic variables namely *EAX* and *EANEER*. The GDPs of major trading partners of ASEAN have relatively the same variations to ASEANGDP over the 33-quarter period.

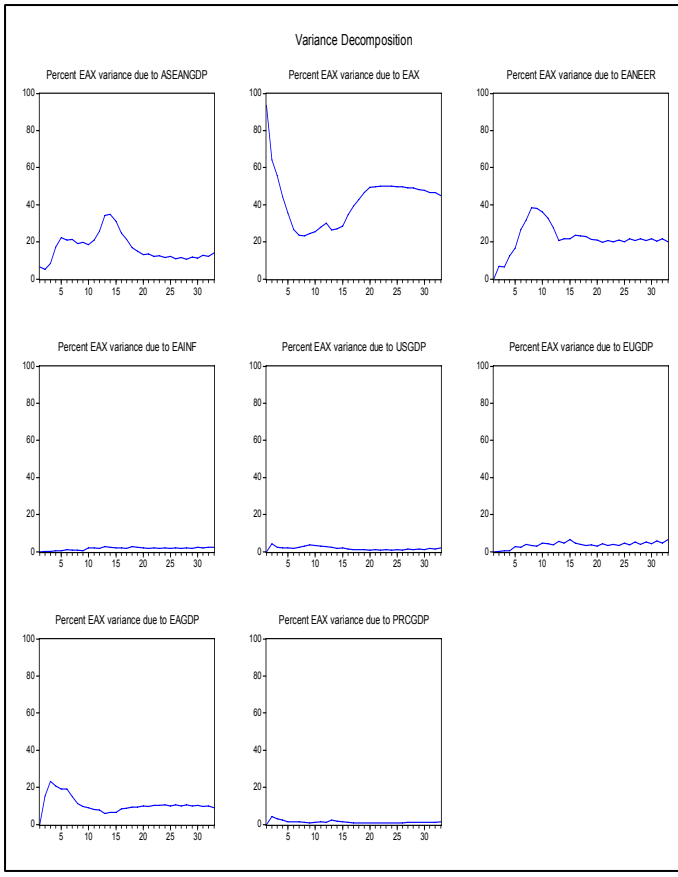
Decomposition of variance for eax

period	std. error	aseangdp	eax	eaneer	eainf
1	3390.38	6.5151	93.4849	0.0000	0.0000
2	5555.79	5.2063	64.2248	6.9269	0.1390
3	7250.16	8.4070	55.7942	6.4417	0.1939
4	8969.93	17.2244	44.3157	12.4053	0.5344
5	11317.7	22.3056	35.6380	16.6159	0.3387
6	13954.2	21.1322	26.7209	26.5716	0.9667
7	16096.2	21.3077	23.4357	31.6849	0.8137
8	18771	19.1087	23.2899	38.3296	0.6944
9	20682.3	19.6738	24.5816	37.9589	0.6080
10	22606.7	18.4285	25.3546	36.2414	2.1372
11	23883.7	20.8449	27.8904	32.7418	1.9147
12	26352.4	25.6490	30.0205	27.6915	1.6021
13	32019	34.3628	26.3601	20.5522	2.8268
14	39060.3	34.7818	27.1222	21.4531	2.2090
15	48729.9	31.0427	28.6832	21.4559	2.0717

16	58920.7	24.6592	34.5257	23.4344	1.9656
17	67842.4	21.2354	39.1558	23.1113	1.7432
18	77889.1	16.8840	42.8404	22.8713	2.7993
19	86647.7	14.9352	46.5612	21.2975	2.2673
20	97251	12.9543	49.3949	20.9694	2.1551
21	109040	13.2547	49.5950	19.8688	1.8745
22	122651	12.1289	49.9379	20.7864	1.9431
23	135584	12.5283	50.0979	20.0597	1.6013
24	151096	11.4551	50.0442	20.8286	2.1657
25	167381	12.1326	49.5536	20.0879	1.8312
26	188255	10.9102	49.6512	21.4986	2.0827
27	211599	11.4551	48.9868	20.5326	1.7962
28	239421	10.5058	48.9202	21.7645	2.1384
29	268200	11.8297	48.2642	20.5188	1.8187
30	302811	11.0833	47.7479	21.6406	2.4422
31	338369	12.8108	46.6436	20.2084	2.1410
32	381530	12.1868	46.4376	21.5939	2.4819
33	432663	13.9835	44.9399	19.9526	2.2834

Decomposition of variance for eax (continued)

period	usgdp	eugdp	eagdp	prcgdp
1	0.0000	0.0000	0.0000	0.0000
2	4.1442	0.0002	15.1553	4.2033
3	2.4786	0.4922	23.2821	2.9105
4	2.0195	0.6057	20.6621	2.2329
5	2.0268	2.6760	18.9527	1.4464
6	1.7503	2.2104	19.1621	1.4857
7	2.4872	3.8471	15.1018	1.3219
8	2.9251	3.4526	11.2278	0.9720
9	3.7524	2.8501	9.7563	0.8188
10	3.2396	4.6532	8.8905	1.0550
11	2.9602	4.2044	8.1596	1.2840
12	2.7073	3.4765	7.6400	1.2132
13	2.2392	5.4910	5.8150	2.3529
14	1.6800	4.5591	6.5082	1.6866
15	2.1835	6.4645	6.5634	1.5351
16	1.4954	4.4693	8.3228	1.1276
17	1.2016	4.0780	8.5805	0.8940
18	1.1201	3.2257	9.4221	0.8371
19	0.9926	3.7360	9.3700	0.8401
20	0.8554	2.9689	9.9925	0.7096
21	0.9750	4.1379	9.5186	0.7755
22	0.7785	3.3086	10.2861	0.8304
23	0.9868	3.8418	10.1336	0.7505
24	0.8684	3.2044	10.6155	0.8180
25	1.0794	4.4860	9.9219	0.9074
26	0.8759	3.5811	10.4834	0.9170
27	1.2793	5.0523	9.9428	0.9548
28	1.0464	4.0317	10.6002	0.9928
29	1.4100	5.2667	9.8630	1.0290
30	1.1614	4.3947	10.3746	1.1553
31	1.6281	5.7615	9.5620	1.2446
32	1.3381	4.7180	10.0019	1.2418
33	1.9266	6.5425	8.9754	1.3961



Most of the *EAX* variations are accounted mostly by domestic variables namely *EAX, ASEANGDP,* and *EANEER*. The GDP of East Asia has more explanatory power in explaining variations in *EAX* compared to *US*, *EU*, and *PRC* over the 33-quarter period.

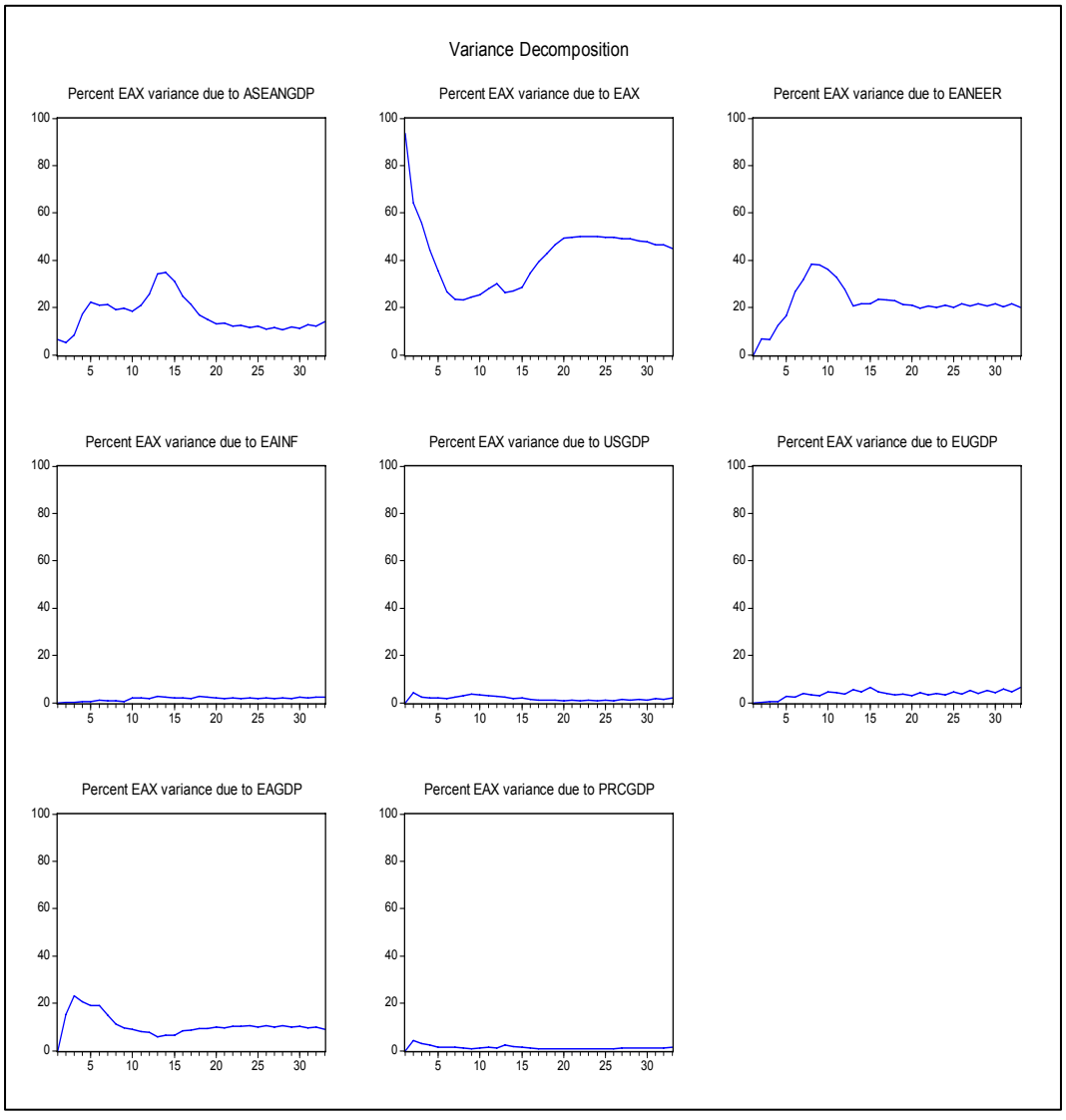
Decomposition of variance for eagdp

period	std. error	aseangdp	eax	eaneer	eainf
1	94.3128	0.1033	33.4584	28.2343	1.4907
2	138.535	0.0580	47.8481	14.9537	0.7308
3	161.598	0.1018	44.7287	11.2062	5.2609
4	177.396	5.9340	39.4003	14.3353	4.4493
5	200.191	12.6864	32.5368	18.4250	3.5686
6	210.831	11.4420	31.0006	21.5131	3.4438
7	227.765	9.8060	29.4780	27.7790	3.8496
8	240.129	9.1445	26.6644	27.7423	5.7730
9	246.055	9.6168	26.7593	27.5078	5.8483
10	251.298	9.7236	27.2878	26.5909	5.6914
11	270.628	15.6133	24.8165	23.0204	7.5873
12	287.218	19.4555	25.9497	20.4432	7.3913
13	322.475	24.6878	26.4672	17.1959	6.6007
14	375.788	23.5083	27.1549	22.0978	5.1248
15	416.197	21.3963	28.9694	23.5419	4.3708
16	463.908	17.2464	36.0973	21.6108	4.8893
17	514.741	14.0990	43.7276	18.9874	4.0204
18	579.219	11.3341	46.3528	18.9170	4.2319
19	621.995	10.3635	47.9235	18.4009	3.6755
20	662.489	9.4819	49.1285	18.4382	3.4322
21	711.075	10.6353	48.7487	17.2207	3.2496
22	779.41	9.7212	47.2481	18.7764	4.0964
23	827.314	10.4748	45.9909	18.9466	3.7060
24	893.057	9.5107	45.6663	20.3210	3.9525
25	992.426	10.6573	44.1487	18.2218	3.9260
26	1126.23	9.5736	43.3101	20.9788	4.2838
27	1253.06	11.4501	41.3009	19.9742	3.9134
28	1399.44	10.3815	41.3491	20.7788	4.5045
29	1575.87	13.2634	39.6784	18.0249	4.2403
30	1798	12.5432	38.6116	20.5853	4.9302
31	2034.53	14.9551	36.2604	18.6071	4.7086
32	2310.24	13.0331	37.1807	20.2842	5.0958
33	2653.61	15.0429	36.1012	17.3456	4.8573

Decomposition of variance for eagdp (continued)

period	usgdp	eugdp	eagdp	prcgdp
1	4.9698	1.2671	30.4763	0.0000
2	3.6185	5.3261	27.1056	0.3593
3	4.8701	8.9052	21.3159	3.6112
4	7.3519	7.3963	17.6985	3.4344
5	7.3146	7.5068	15.1471	2.8145
6	6.6012	9.2953	13.6589	3.0450
7	6.2018	8.1067	12.0388	2.7401
8	5.5963	10.4761	11.3345	3.2688
9	5.7640	10.4952	10.7985	3.2102
10	5.6185	10.2047	11.0541	3.8291
11	4.8650	9.6940	10.1494	4.2542
12	4.3193	8.8097	9.6497	3.9816
13	4.4070	9.2417	7.6963	3.7033
14	3.9963	7.1140	8.1659	2.8380
15	3.3933	6.3533	9.6515	2.3234
16	3.2986	5.1330	9.8150	1.9096
17	2.6913	5.4294	9.3920	1.6530
18	2.1907	4.3244	10.9894	1.6597
19	2.0781	4.7410	11.3308	1.4868
20	1.9651	4.2579	11.8192	1.4769
21	2.1788	5.5750	10.9038	1.4881

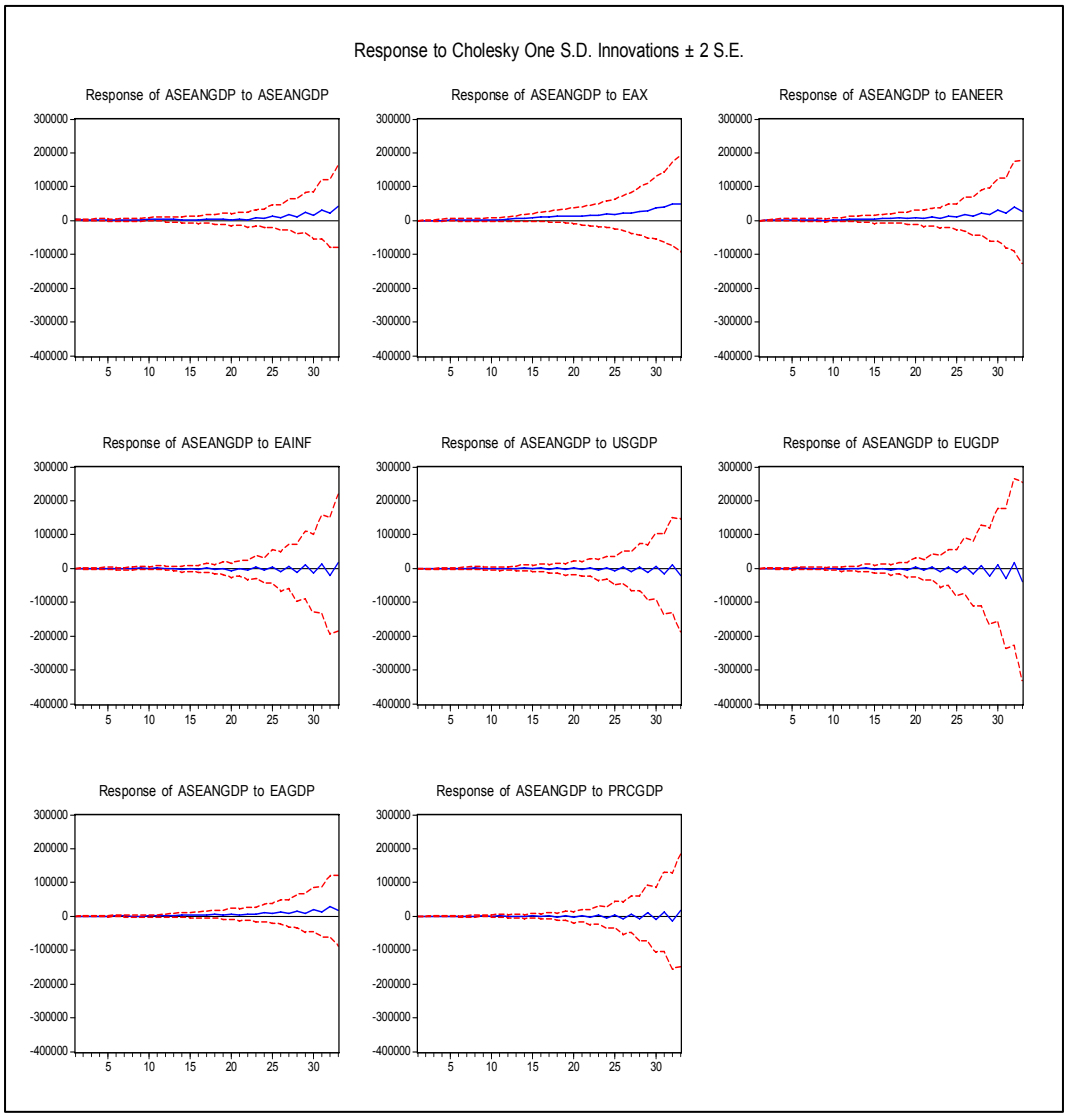
22	1.8393	5.2206	11.0976	2.0004
23	2.2824	5.8735	10.8492	1.8766
24	2.1650	5.3634	11.1471	1.8740
25	2.6406	8.5360	9.5830	2.2866
26	2.1138	7.0796	10.2362	2.4240
27	2.7979	8.5882	9.6287	2.3467
28	2.5118	7.7498	10.2966	2.4279
29	3.1639	10.2576	8.5839	2.7876
30	2.5604	8.8958	9.0051	2.8683
31	3.5737	11.0090	7.8704	3.0156
32	3.0871	9.5879	8.7752	2.9561
33	3.7016	12.3043	7.3429	3.3042



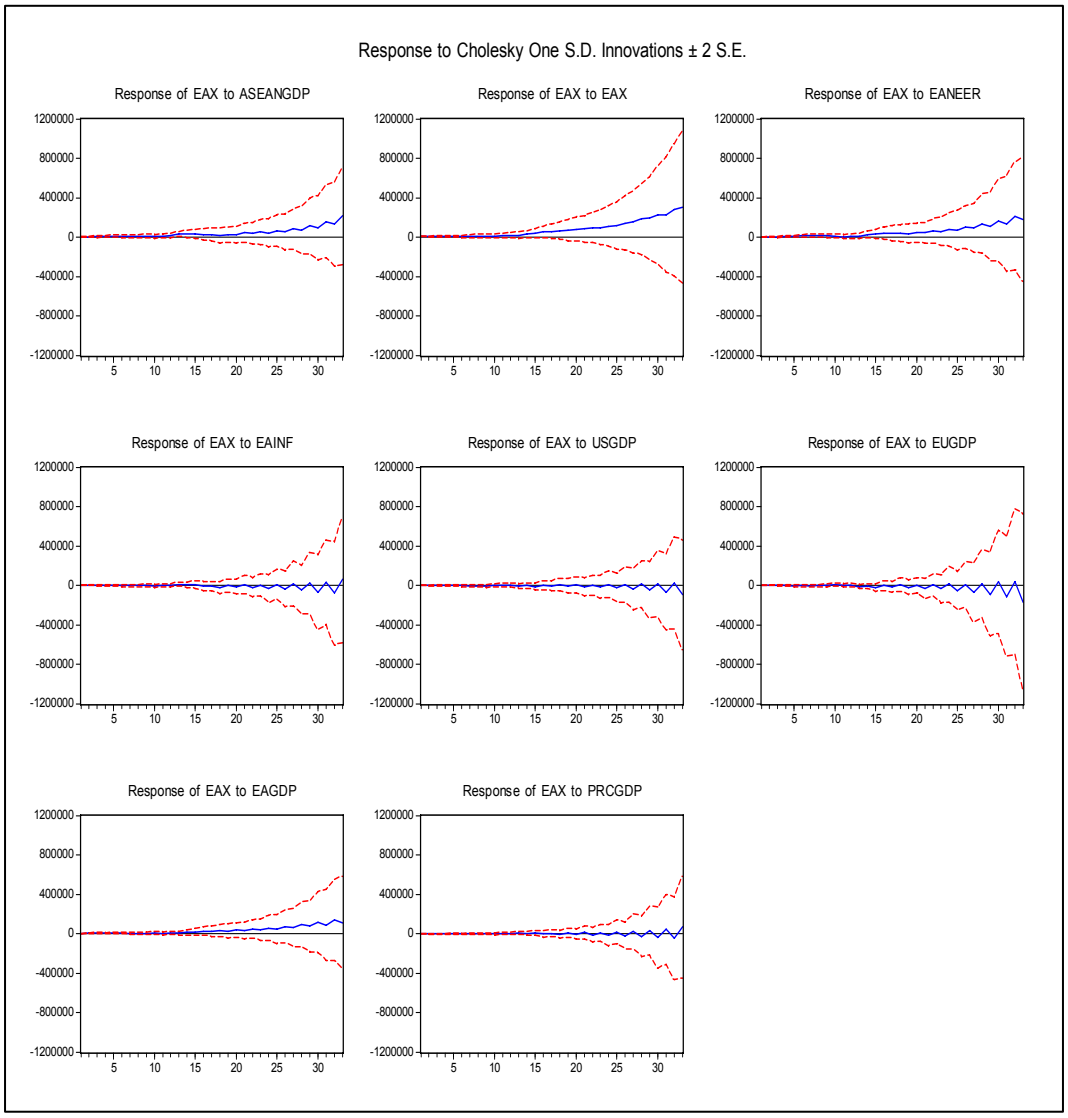
Most of the *EAGDP* variations are accounted mostly by domestic variables namely *EAX, ASEANGDP,* and *EANEER*. The GDP of East Asia has more explanatory power in explaining variations in *EAX* compared to *US*, *EU*, and *PRC* over the 33-quarter period.

5 Impulse Responses

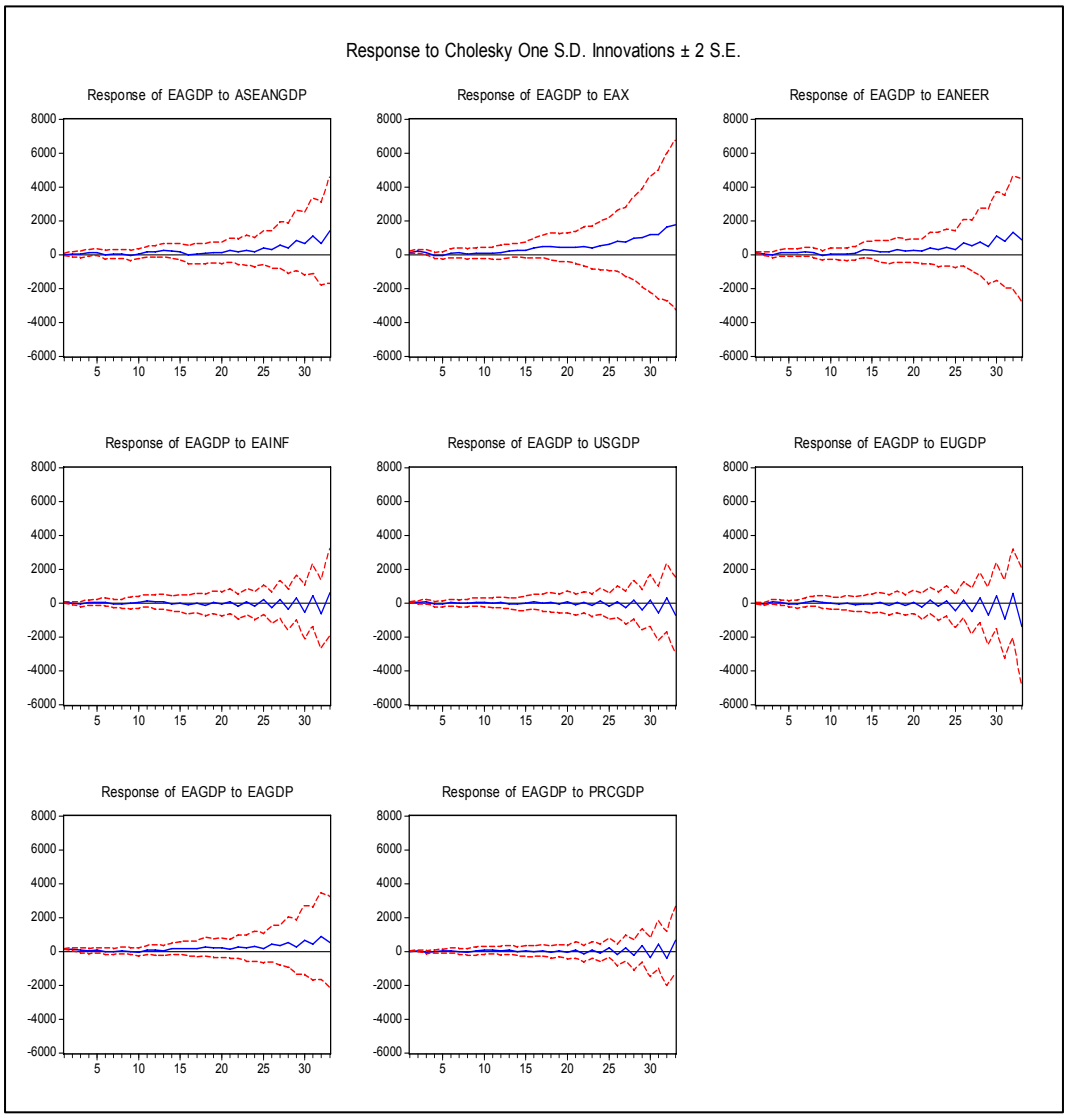
Results, at least qualitatively, are reflected in the impulse-response functions plotted. The response functions are plotted together with two standard deviation bands. Generally stated, if the bands do not encompass zero, then the responses are significantly different from zero. The results show that the shocks in *ASEANGDP* due to domestic variables are significant at initial periods. The GDPs of major trading partners of ASEAN also contribute significant shocks to ASEANGDP at initial periods.



The results show that shocks in *EAX* coming from domestic variables and the GDPs of major trading partners are significant at early periods. Indeed, disturbances from major trading partners seem to be the major source of the *EAX* fluctuations.



The results show that shocks in *EAGDP* coming from domestic variables and the GDPs of major trading partners are significant at early periods. Indeed, disturbances from major trading partners seem to be the major source of the *EAGDP* fluctuations.


Response to Cholesky One S.D. Innovations ± 2 S.E.
Response of EAGDP to ASEANGDP
Response of EAGDP to EAX
Response of EAGDP to EANEER
Response of EAGDP to EAINF
Response of EAGDP to USGDP
Response of EAGDP to EUGDP
Response of EAGDP to EAGDP
Response of EAGDP to PRCGDP
8000
6000
4000
2000
0
-2000
-4000
-6000
5
10
15
20
25
30

APPENDIX 6: $ASEANGDP_t = f(EAGDP_t, EAX_t, EANINF_t, EANEER_t, USM_t, EUM_t, PRCM_t)$

1 Optimal VAR Lag Selection

```
VAR system, maximum lag order 5

The asterisks below indicate the best (that is, minimized) values
of the respective information criteria, AIC = Akaike criterion,
BIC = Schwartz Bayesian criterion and HQC = Hannan-Quinn criterion.

lags        loglik    p(LR)       AIC          BIC          HQC

   1   -4142.98805           139.245510   142.844377*  140.655940
   2   -4060.60749  0.00000  138.642869   144.456423   140.921255
   3   -3977.68490  0.00000  138.022456   146.050697   141.168799
   4   -3830.65393  0.00000  135.300129   145.543058   139.314429
   5   -3683.44360  0.00000  132.571921*  145.029538   137.454178*
```

The optimal lag structure is 5 based from the lowest AIC and HQC (Gujarati, 2003). Hence, we have a VAR (5) model. Testing for further lags cannot anymore be implemented due to insufficiency of observations.

2 Johansen–Juselius Cointegration Test

```
Johansen test:
Number of equations = 8
Lag order = 5
Estimation period: 1993:1 - 2008:1 (T = 61)

Case 3: Unrestricted constant
Rank Eigenvalue Trace test p-value   Lmax test  p-value
   0    0.93378     432.71 [0.0000]     165.60 [0.0000]
   1    0.71333     267.10 [0.0000]     76.214 [0.0000]
   2    0.63616     190.89 [0.0000]     61.674 [0.0000]
   3    0.54759     129.22 [0.0000]     48.383 [0.0002]
   4    0.47867     80.833 [0.0000]     39.734 [0.0004]
   5    0.35327     41.099 [0.0014]     26.586 [0.0061]
   6    0.21005     14.513 [0.0687]     14.383 [0.0459]
   7  0.0021371    0.13050 [0.7179]    0.13050 [0.7179]
```

Both the trace and λ-max tests rejected the null hypothesis that the smallest eigenvalue is 0 up to rank 6, so we may conclude that the series are in fact stationary (Enders, 2003). However, some linear combination may be I(d), since the trace and λ-max test accepted the hypothesis that the smallest eigenvalue is 0 in rank 7. The rejection of the hypothesis denotes the number of cointegrating equations, in this case, is at most 8. Since there is cointegration, OLS estimates of the structural relationships have the property of consistency (Mulligan, 2003).

3 VAR Estimation Results

```
VAR system, lag order 5
OLS estimates, observations 1993:1-2008:1 (T = 61)
Log-likelihood = -3795.592
Determinant of covariance matrix = 1.5355326e+044
AIC = 135.1997
BIC = 146.5500
HQC = 139.6480
Portmanteau test: LB(15) = 1153.74 (df = 640, p-value 0.000000)
```

Equation 1: aseangdp

	coefficient	std. error	t-ratio	p-value	
const	27083.6	24423.0	1.109	0.2806	
aseangdp_1	0.510063	0.243383	2.096	0.0490	**
aseangdp_2	0.0918427	0.273992	0.3352	0.7410	
aseangdp_3	0.00703296	0.235394	0.02988	0.9765	
aseangdp_4	-0.104539	0.251683	-0.4154	0.6823	
aseangdp_5	-0.148142	0.229168	-0.6464	0.5253	
eax_1	-0.0376606	0.146839	-0.2565	0.8002	
eax_2	-0.0320544	0.116204	-0.2758	0.7855	
eax_3	0.0138149	0.113007	0.1222	0.9039	
eax_4	0.199900	0.100424	1.991	0.0604	*
eax_5	-0.0688440	0.106011	-0.6494	0.5235	
eaneer_1	-607.636	474.321	-1.281	0.2148	
eaneer_2	313.585	420.040	0.7466	0.4640	
eaneer_3	-24.6013	490.353	-0.05017	0.9605	
eaneer_4	57.2051	460.575	0.1242	0.9024	
eaneer_5	248.870	332.326	0.7489	0.4627	
eainf_1	-333.771	474.237	-0.7038	0.4897	
eainf_2	-469.765	412.943	-1.138	0.2687	
eainf_3	-155.528	385.489	-0.4035	0.6909	
eainf_4	39.8879	429.719	0.09282	0.9270	
eainf_5	-306.870	443.843	-0.6914	0.4973	
eagdp_1	3.19849	4.50246	0.7104	0.4857	
eagdp_2	2.00701	5.20987	0.3852	0.7041	
eagdp_3	0.0384067	4.51822	0.008500	0.9933	
eagdp_4	-3.57499	4.69797	-0.7610	0.4556	
eagdp_5	-2.01523	3.28962	-0.6126	0.5470	
usm_1	0.0804714	0.142762	0.5637	0.5792	
usm_2	0.00594459	0.134736	0.04412	0.9652	
usm_3	-0.0178217	0.179472	-0.09930	0.9219	
usm_4	-0.246290	0.166329	-1.481	0.1543	
usm_5	0.0723517	0.195318	0.3704	0.7150	
eum_1	-1.44284E-05	0.000133800	-0.1078	0.9152	
eum_2	2.69782E-05	0.000131172	0.2057	0.8391	
eum_3	3.22570E-05	0.000123055	0.2621	0.7959	
eum_4	-4.90985E-05	0.000127876	-0.3840	0.7051	
eum_5	-9.30749E-05	0.000123960	-0.7508	0.4615	
prcm_1	0.118679	0.136959	0.8665	0.3965	
prcm_2	0.0994085	0.135305	0.7347	0.4710	
prcm_3	0.0458088	0.141989	0.3226	0.7503	
prcm_4	-0.0420199	0.149235	-0.2816	0.7812	
prcm_5	0.0645003	0.158653	0.4066	0.6887	

Mean of dependent variable = 37985.7
Standard deviation of dep. var. = 24426.8
Sum of squared residuals = 2.07253e+008
Standard error of the regression = 3219.11
Unadjusted R-squared = 0.99421
F-statistic (40, 20) = 85.8682 (p-value < 0.00001)
Durbin-Watson statistic = 2.31152
First-order autocorrelation coeff. = -0.161338

F-tests of zero restrictions:

All lags of aseangdp F(5, 20) = 2.6714, p-value 0.0525
All lags of eax F(5, 20) = 1.2975, p-value 0.3044
All lags of eaneer F(5, 20) = 0.77225, p-value 0.5809
All lags of eainf F(5, 20) = 0.47847, p-value 0.7880
All lags of eagdp F(5, 20) = 0.61344, p-value 0.6909

```
  All lags of usm                F(5, 20) =  0.97747, p-value 0.4554
  All lags of eum                F(5, 20) =  0.24467, p-value 0.9376
  All lags of prcm               F(5, 20) =   1.0767, p-value 0.4028
  All vars, lag 5                F(8, 20) =  0.99998, p-value 0.4660

Equation 2: eax

               coefficient      std. error     t-ratio   p-value
  ------------------------------------------------------------------
  const       66689.5          91974.8          0.7251   0.4768
  aseangdp_1     -0.0747981        0.916557     -0.08161  0.9358
  aseangdp_2      0.468581         1.03183       0.4541   0.6546
  aseangdp_3      1.05251          0.886473      1.187    0.2490
  aseangdp_4     -0.747651         0.947816     -0.7888   0.4395
  aseangdp_5     -0.679337         0.863025     -0.7872   0.4404
  eax_1           0.606410         0.552984      1.097    0.2858
  eax_2           0.132180         0.437615      0.3020   0.7657
  eax_3          -0.106843         0.425574     -0.2511   0.8043
  eax_4           0.817649         0.378187      2.162    0.0429  **
  eax_5          -0.182930         0.399229     -0.4582   0.6517
  eaneer_1     -361.093         1786.25         -0.2022   0.8418
  eaneer_2    -1506.67          1581.83         -0.9525   0.3522
  eaneer_3      729.006         1846.62          0.3948   0.6972
  eaneer_4      408.425         1734.48          0.2355   0.8162
  eaneer_5     1273.29          1251.51          1.017    0.3211
  eainf_1       119.609         1785.93          0.06697  0.9473
  eainf_2      -564.262         1555.10         -0.3628   0.7205
  eainf_3       552.349         1451.72          0.3805   0.7076
  eainf_4      -371.831         1618.28         -0.2298   0.8206
  eainf_5      1475.52          1671.47          0.8828   0.3878
  eagdp_1        14.4580          16.9558        0.8527   0.4039
  eagdp_2         4.38125         19.6199        0.2233   0.8256
  eagdp_3         9.25424         17.0152        0.5439   0.5925
  eagdp_4        -8.01258         17.6921       -0.4529   0.6555
  eagdp_5       -37.8153          12.3884       -3.052    0.0063  ***
  usm_1           1.11445          0.537626      2.073    0.0513  *
  usm_2          -0.628839         0.507402     -1.239    0.2296
  usm_3          -0.911641         0.675875     -1.349    0.1925
  usm_4           0.338266         0.626378      0.5400   0.5951
  usm_5          -0.0517480        0.735550     -0.07035  0.9446
  eum_1          -0.000417631      0.000503878  -0.8288   0.4170
  eum_2           0.000385963      0.000493983   0.7813   0.4438
  eum_3          -0.000327888      0.000463415  -0.7075   0.4874
  eum_4          -0.000292070      0.000481570  -0.6065   0.5510
  eum_5           0.000165543      0.000466823   0.3546   0.7266
  prcm_1         -0.525046         0.515773     -1.018    0.3208
  prcm_2          0.180451         0.509544      0.3541   0.7269
  prcm_3          0.986352         0.534717      1.845    0.0800  *
  prcm_4         -0.210589         0.562007     -0.3747   0.7118
  prcm_5          0.0252523        0.597471      0.04227  0.9667

  Mean of dependent variable = 434669
  Standard deviation of dep. var. = 200558
  Sum of squared residuals = 2.93927e+009
  Standard error of the regression = 12122.8
  Unadjusted R-squared = 0.99878
  F-statistic (40, 20) = 410.045 (p-value < 0.00001)
  Durbin-Watson statistic = 2.04159
  First-order autocorrelation coeff. = -0.0454815
```

F-tests of zero restrictions:

All lags of aseangdp F(5, 20) = 1.0582, p-value 0.4122
All lags of eax F(5, 20) = 2.9609, p-value 0.0369
All lags of eaneer F(5, 20) = 1.1145, p-value 0.3842
All lags of eainf F(5, 20) = 0.21553, p-value 0.9518
All lags of eagdp F(5, 20) = 2.8714, p-value 0.0411
All lags of usm F(5, 20) = 1.8469, p-value 0.1493
All lags of eum F(5, 20) = 0.78345, p-value 0.5735
All lags of prcm F(5, 20) = 1.4326, p-value 0.2557
All vars, lag 5 F(8, 20) = 2.6642, p-value 0.0361

Equation 5: eagdp

	coefficient	std. error	t-ratio	p-value	
const	565.156	2304.48	0.2452	0.8088	
aseangdp_1	-0.00768619	0.0229649	-0.3347	0.7413	
aseangdp_2	0.0227609	0.0258531	0.8804	0.3891	
aseangdp_3	-0.00524093	0.0222111	-0.2360	0.8159	
aseangdp_4	0.00489348	0.0237481	0.2061	0.8388	
aseangdp_5	-0.0308486	0.0216236	-1.427	0.1691	
eax_1	0.00474377	0.0138553	0.3424	0.7356	
eax_2	0.00211025	0.0109647	0.1925	0.8493	
eax_3	-0.00775222	0.0106630	-0.7270	0.4756	
eax_4	0.0145927	0.00947569	1.540	0.1392	
eax_5	-0.00618124	0.0100029	-0.6179	0.5436	
eaneer_1	-7.45659	44.7556	-0.1666	0.8694	
eaneer_2	21.3861	39.6337	0.5396	0.5954	
eaneer_3	33.1592	46.2682	0.7167	0.4819	
eaneer_4	-6.61391	43.4585	-0.1522	0.8806	
eaneer_5	35.6182	31.3573	1.136	0.2694	
eainf_1	3.51824	44.7476	0.07862	0.9381	
eainf_2	32.7628	38.9641	0.8408	0.4104	
eainf_3	57.3932	36.3736	1.578	0.1303	
eainf_4	0.715971	40.5470	0.01766	0.9861	
eainf_5	-3.28548	41.8797	-0.07845	0.9382	
eagdp_1	0.487765	0.424838	1.148	0.2645	
eagdp_2	-0.370067	0.491588	-0.7528	0.4603	
eagdp_3	-0.203887	0.426326	-0.4782	0.6377	
eagdp_4	0.0650713	0.443287	0.1468	0.8848	
eagdp_5	-0.629583	0.310399	-2.028	0.0561	*
usm_1	-0.000533509	0.0134706	-0.03961	0.9688	
usm_2	0.00988225	0.0127133	0.7773	0.4461	
usm_3	-0.0211624	0.0169345	-1.250	0.2258	
usm_4	0.00957140	0.0156943	0.6099	0.5488	
usm_5	-0.0109367	0.0184297	-0.5934	0.5595	
eum_1	-5.46472E-06	1.26250E-05	-0.4329	0.6698	
eum_2	3.96519E-06	1.23770E-05	0.3204	0.7520	
eum_3	9.13164E-06	1.16111E-05	0.7865	0.4408	
eum_4	-1.07291E-05	1.20660E-05	-0.8892	0.3845	
eum_5	1.32588E-05	1.16965E-05	1.134	0.2704	
prcm_1	0.00313787	0.0129230	0.2428	0.8106	
prcm_2	-0.00874508	0.0127669	-0.6850	0.5012	
prcm_3	0.0120921	0.0133977	0.9026	0.3775	
prcm_4	0.000113727	0.0140814	0.008076	0.9936	
prcm_5	-0.00115901	0.0149700	-0.07742	0.9391	

Mean of dependent variable = 5639.14
Standard deviation of dep. var. = 837.647
Sum of squared residuals = 1.84522e+006
Standard error of the regression = 303.745
Unadjusted R-squared = 0.95617

```
  F-statistic (40, 20) = 10.9076 (p-value < 0.00001)
  Durbin-Watson statistic = 2.0796
  First-order autocorrelation coeff. = -0.0584732

  F-tests of zero restrictions:

  All lags of aseangdp           F(5, 20) =  0.99045, p-value 0.4483
  All lags of eax                F(5, 20) =  0.62300, p-value 0.6840
  All lags of eaneer             F(5, 20) =  0.37481, p-value 0.8600
  All lags of eainf              F(5, 20) =  0.74085, p-value 0.6019
  All lags of eagdp              F(5, 20) =   1.4285, p-value 0.2570
  All lags of usm                F(5, 20) =  0.84639, p-value 0.5331
  All lags of eum                F(5, 20) =  0.73232, p-value 0.6077
  All lags of prcm               F(5, 20) =  0.20346, p-value 0.9572
  All vars, lag 5                F(8, 20) =   1.7522, p-value 0.1473

For the system as a whole:

  Null hypothesis: the longest lag is 4
  Alternative hypothesis: the longest lag is 5
  Likelihood ratio test: Chi-square(64) = 212.765 (p-value 0.000000)

  Comparison of information criteria:
  Lag order 5: AIC = 135.200, BIC = 146.550, HQC = 139.648
  Lag order 4: AIC = 136.589, BIC = 145.725, HQC = 140.170
```

From Equation 1, it can be seen from the results ASEANGDP and EAX are significant in influencing *ASEANGDP* at the first lag. From Equation 2, the *EAGDP*, *USM*, and *PRCM* are significant in influencing *EAX*. From Equation 3, only the fifth lag of EAGDP is significant in influencing EAGDP.

4 Variance Decomposition

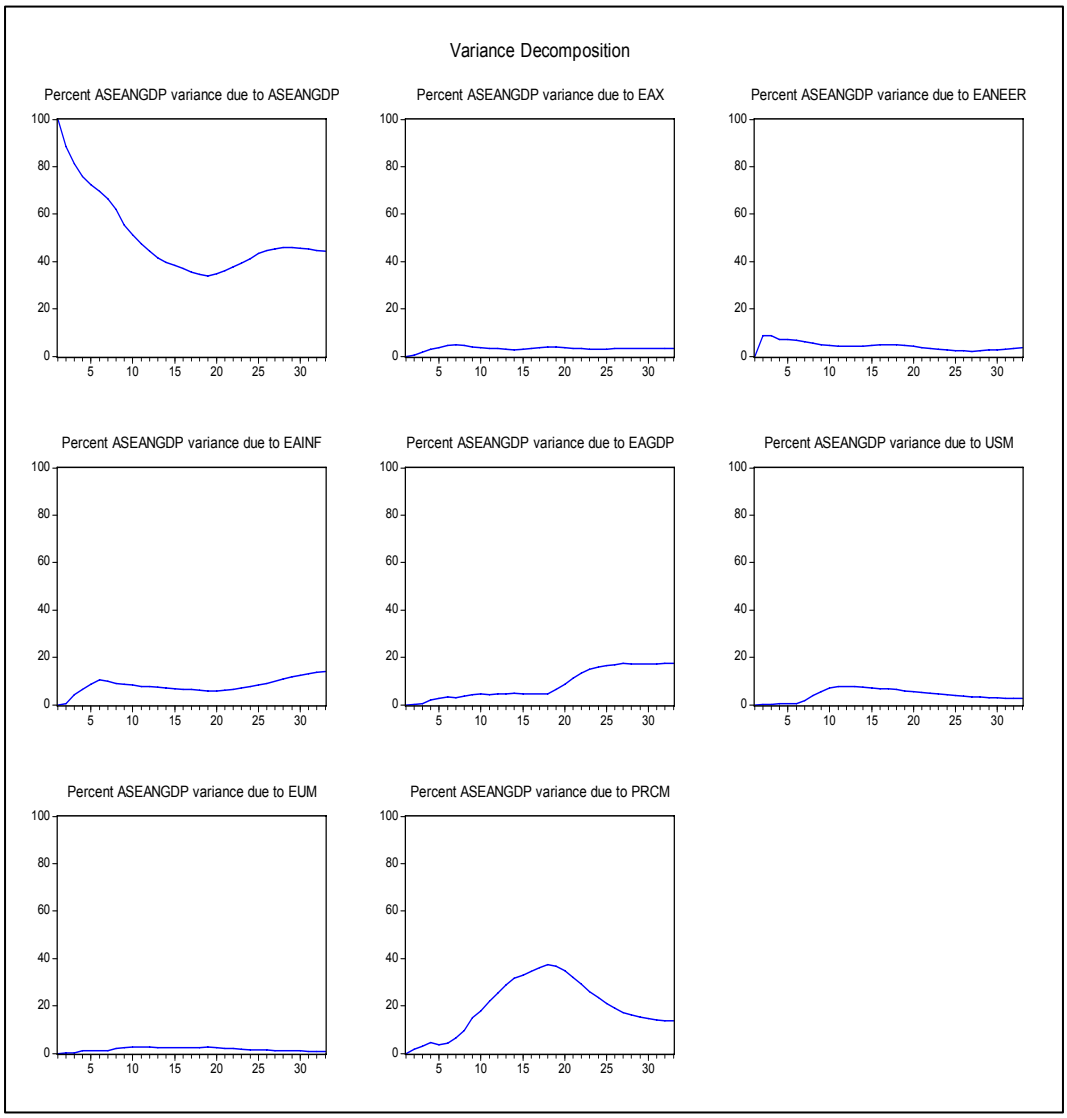
Decomposition of variance for aseangdp

period	std. error	aseangdp	eax	eaneer	eainf
1	1843.25	100.0000	0.0000	0.0000	0.0000
2	2248.52	88.4120	0.3524	8.7004	0.3830
3	2604.69	81.3230	1.8470	8.7799	4.1682
4	3002.96	75.7243	3.0021	7.0966	6.3255
5	3348.72	72.4565	3.6921	7.2284	8.5803
6	3512.17	69.4833	4.4229	6.7915	10.4398
7	3682.62	66.3027	4.9278	6.2122	9.9665
8	3945.74	61.8495	4.4446	5.4152	8.9934
9	4195.12	55.2113	3.9441	4.8065	8.5271
10	4372.21	51.1459	3.6365	4.6928	8.2288
11	4568.13	47.4965	3.3775	4.4074	7.7457
12	4727.05	44.3917	3.1562	4.3730	7.7254
13	4886.3	41.6162	2.9580	4.3961	7.3769
14	5020.3	39.7218	2.8058	4.3354	7.0648
15	5116.96	38.4195	2.9446	4.7304	6.8053
16	5209.38	37.0715	3.3897	4.8008	6.6145
17	5334.57	35.5585	3.7438	4.8633	6.3162
18	5464.93	34.6596	3.8349	4.7628	6.0453
19	5635.34	34.0267	3.9276	4.4997	5.9247
20	5872.84	34.7075	3.7601	4.1557	5.9467
21	6178.93	35.9658	3.3996	3.7573	6.0621
22	6511.09	37.6081	3.2147	3.4214	6.4006
23	6909.66	39.3298	3.0087	3.0622	7.0911
24	7299.39	41.2917	3.0214	2.7505	7.6578

25	7741.81	43.2413	3.0343	2.4726	8.3574
26	8192.45	44.6263	3.1928	2.2645	9.0546
27	8618.97	45.3239	3.1865	2.2067	10.0152
28	9004.46	45.8349	3.2569	2.2946	10.8946
29	9343.33	45.9046	3.3014	2.5598	11.7069
30	9650.88	45.6169	3.3976	2.8036	12.4869
31	9921.9	45.1418	3.3337	3.0739	13.1612
32	10167.1	44.7302	3.2971	3.4046	13.6523
33	10412.4	44.1855	3.2542	3.7488	13.9527

Decomposition of variance for aseangdp (continued)

period	eagdp	usm	eum	prcm
1	0.0000	0.0000	0.0000	0.0000
2	0.2268	0.2413	0.0005	1.6836
3	0.5157	0.2941	0.0257	3.0464
4	2.0232	0.3202	1.0834	4.4247
5	2.8343	0.4649	1.0370	3.7065
6	3.2175	0.4614	0.9504	4.2332
7	3.0175	1.7597	1.2565	6.5570
8	3.5518	4.0726	1.9111	9.7618
9	4.3780	5.6538	2.4198	15.0593
10	4.6360	7.1913	2.7197	17.7489
11	4.3774	7.8640	2.8366	21.8948
12	4.5923	7.7974	2.6551	25.3088
13	4.5492	7.6036	2.4952	29.0048
14	4.8006	7.2993	2.3692	31.6030
15	4.7221	7.0960	2.2810	33.0010
16	4.5563	6.8771	2.2536	34.4365
17	4.4199	6.6311	2.2903	36.1769
18	4.7140	6.3206	2.4223	37.2404
19	6.3272	5.9587	2.5297	36.8056
20	8.7709	5.5463	2.3997	34.7133
21	11.3420	5.2278	2.1748	32.0707
22	13.3004	4.9513	1.9585	29.1450
23	15.0753	4.5706	1.7484	26.1140
24	15.9117	4.2588	1.5682	23.5400
25	16.5079	3.9150	1.4018	21.0697
26	16.9701	3.6414	1.2624	18.9880
27	17.3713	3.4009	1.1550	17.3405
28	17.3217	3.2102	1.0816	16.1056
29	17.1682	3.0396	1.0347	15.2847
30	17.1393	2.9189	0.9875	14.6494
31	17.3294	2.8296	0.9417	14.1886
32	17.3901	2.7634	0.9114	13.8509
33	17.5409	2.7425	0.8841	13.6912



Most of the *ASEANGDP* variations are accounted mostly by *PRCM, EAGDP,* and ASEANGDP while other variables have a relatively fair share of explanatory powers on the variations in ASEANGDP over the 33-quarter period.

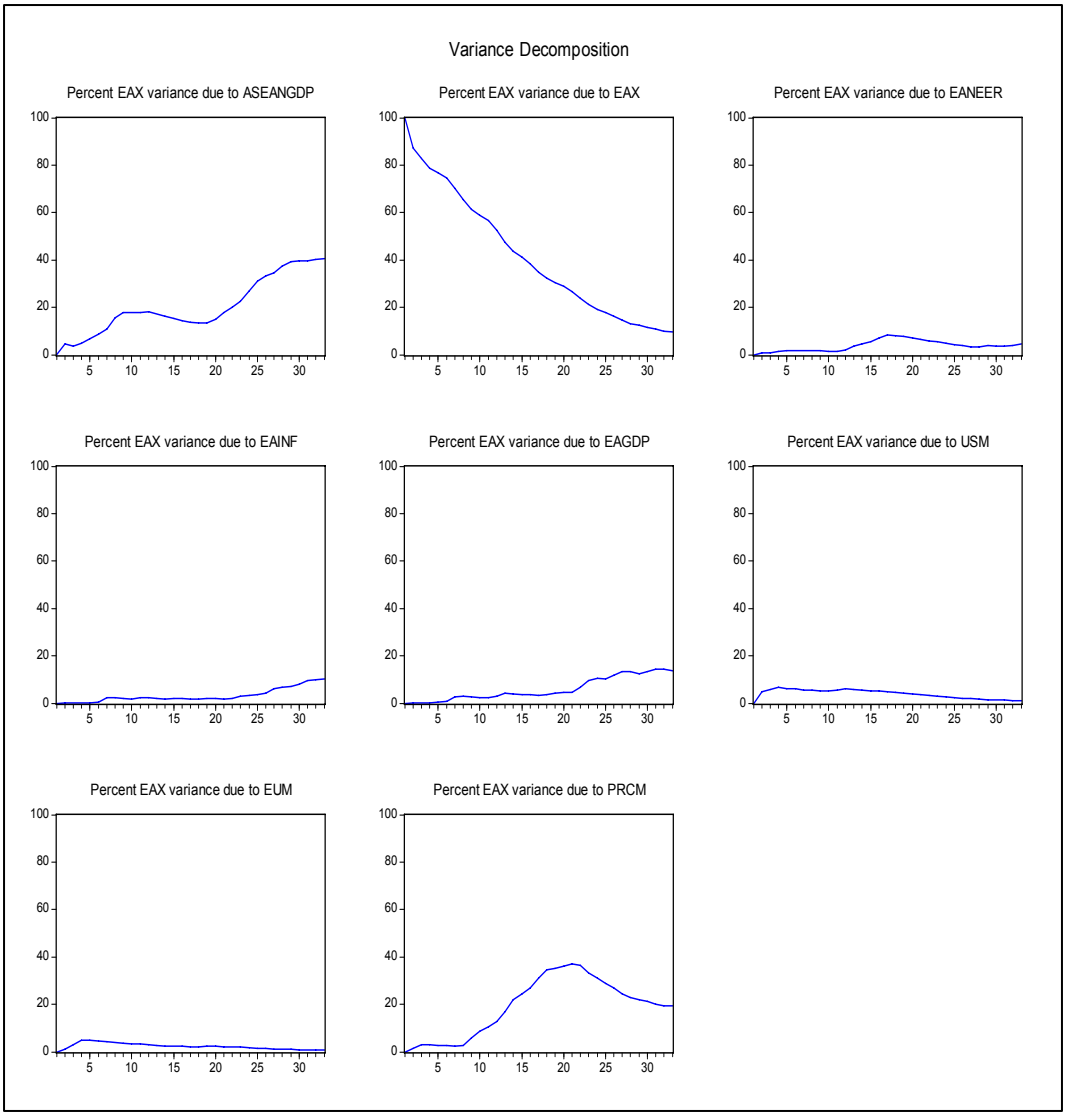
Decomposition of variance for eax

period	std. error	aseangdp	eax	eaneer	eainf
1	6941.52	0.2999	99.7001	0.0000	0.0000
2	11464.4	4.5753	87.1120	0.8429	0.0753
3	14971	3.6787	82.8798	0.9169	0.1269
4	16363.7	5.0363	78.8193	1.2629	0.1065
5	18452.6	6.7815	76.9658	1.8562	0.1257
6	19458.7	8.6988	74.6408	1.7026	0.5182
7	20529.8	10.9211	70.0526	1.6937	2.2481
8	21286.8	15.5442	65.3309	1.5774	2.2500
9	22856.2	17.8422	61.4381	1.5845	1.9945
10	23916.6	17.9351	58.8971	1.4817	1.8323
11	24809.7	17.9162	56.7115	1.4030	2.4458

12	25764.9	18.2045	52.6015	2.1267	2.3134
13	27673	17.2123	47.4589	3.7654	2.0446
14	29006.2	16.1049	43.6686	4.6315	1.8671
15	29946.2	15.1594	41.1985	5.5793	2.1065
16	31204.6	14.4046	38.3041	7.1507	1.9454
17	32904.2	13.7020	34.8421	8.2708	1.7583
18	34133.9	13.3697	32.3822	8.0453	1.7073
19	35156.9	13.4572	30.5255	7.6062	2.1406
20	36462	15.0612	28.8820	7.2220	2.0240
21	38449	17.8144	26.5022	6.6208	1.8753
22	40741.4	20.0325	23.8005	5.9527	1.9431
23	43249.1	22.4457	21.3345	5.4273	2.9408
24	45816.1	26.9794	19.0131	4.8692	3.1994
25	49251.3	31.0919	17.8567	4.3662	3.5135
26	52766.5	33.2408	16.2178	3.8084	4.3894
27	56078.1	34.6463	14.7633	3.3748	6.2229
28	59226.9	37.4722	13.2358	3.4609	6.8966
29	63025.7	39.3281	12.6123	3.7917	7.2283
30	66576.1	39.6029	11.6577	3.6820	8.0275
31	69783.7	39.4325	10.7684	3.5414	9.5994
32	72775.8	40.2441	9.9157	4.0461	10.0778
33	76302.9	40.5978	9.6378	4.5752	10.1836

Decomposition of variance for eax (continued)

period	eagdp	usm	eum	prcm
1	0.0000	0.0000	0.0000	0.0000
2	0.0676	4.8168	1.2425	1.2675
3	0.3134	5.8402	3.1429	3.1013
4	0.2857	6.8672	4.7626	2.8595
5	0.3706	6.2483	4.8972	2.7548
6	0.9203	6.2260	4.6905	2.6029
7	2.7956	5.5962	4.3101	2.3827
8	3.0666	5.6254	4.0097	2.5959
9	2.6605	5.3167	3.4830	5.6806
10	2.4322	5.3576	3.2846	8.7794
11	2.2629	5.6222	3.2264	10.4119
12	2.9558	6.0109	3.0266	12.7607
13	4.1060	5.7624	2.6628	16.9875
14	3.9699	5.4444	2.4620	21.8516
15	3.7616	5.2826	2.4658	24.4461
16	3.6239	5.1762	2.2806	27.1145
17	3.4219	4.7714	2.0525	31.1810
18	3.5851	4.4506	2.0610	34.3988
19	4.4098	4.2096	2.3240	35.3270
20	4.5061	4.0182	2.2341	36.0524
21	4.4451	3.6241	2.0617	37.0564
22	6.7036	3.2426	2.0466	36.2783
23	9.6469	2.9228	1.9740	33.3079
24	10.5574	2.6164	1.7647	31.0003
25	10.2870	2.3125	1.5608	29.0114
26	11.9088	2.1124	1.3701	26.9523
27	13.4253	1.9409	1.2320	24.3945
28	13.3380	1.7426	1.1290	22.7249
29	12.4887	1.5533	1.0228	21.9748
30	13.2934	1.4364	0.9341	21.3660
31	14.3351	1.3564	0.8770	20.0899
32	14.2616	1.2559	0.8290	19.3698
33	13.7148	1.1960	0.7891	19.3056



Most of the *EAX* variations are accounted mostly by EAM and PRCM. The variations caused by the imports of US and EU are approximately the same while ASEANGDP has more explanatory powers over EAGDP over the 33-quarter period.

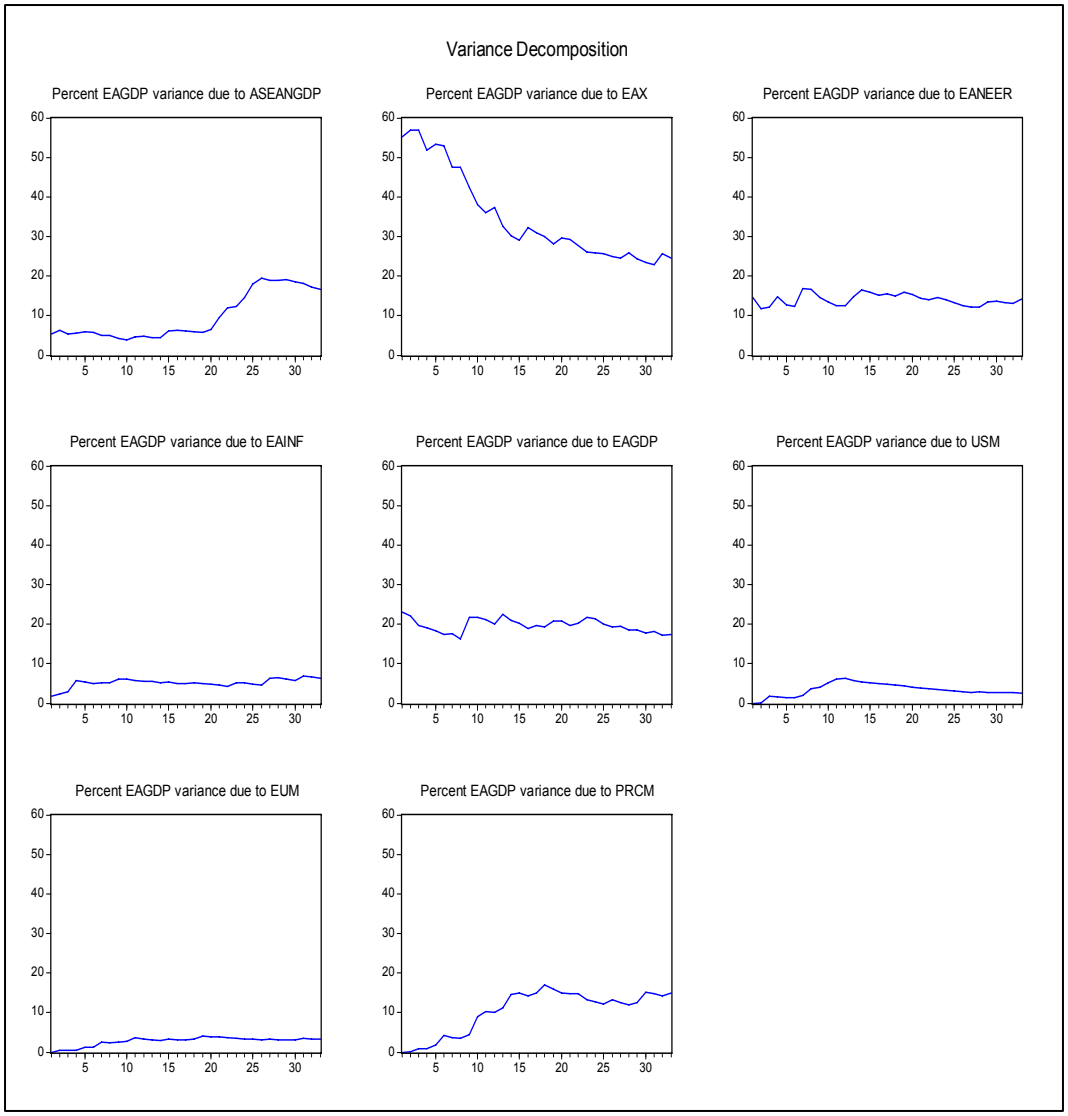
Decomposition of variance for eagdp

period	std. error	aseangdp	eax	eaneer	eainf
1	173.924	5.3434	55.1605	14.5326	1.8547
2	201.427	6.3878	56.9707	11.6812	2.2782
3	220.876	5.3342	56.9700	12.1245	2.8223
4	231.831	5.6153	51.8242	14.6724	5.7734
5	251.771	5.9504	53.2665	12.6875	5.2901
6	258.508	5.6618	52.9017	12.3735	5.0323
7	276.6	4.9972	47.5010	16.7722	5.0959
8	287.288	4.9174	47.5462	16.7014	5.0818
9	310.742	4.2041	42.4969	14.5248	6.0480
10	328.248	3.7774	38.1154	13.3846	6.0467
11	338.697	4.5626	35.9780	12.5714	5.6794

12	358.569	4.8795	37.2512	12.4809	5.5644
13	383.504	4.3543	32.6503	14.8540	5.5272
14	401.262	4.4683	30.1402	16.4355	5.2535
15	408.749	6.1240	29.0466	15.9604	5.2908
16	424.03	6.3888	32.3190	15.2266	4.9539
17	433.728	6.1322	30.9057	15.5278	4.9678
18	442.321	5.9516	29.9290	14.9304	5.1056
19	456.269	5.6700	28.1906	15.8585	5.0297
20	471.097	6.5265	29.7123	15.2690	4.7229
21	484.102	9.4861	29.3026	14.4646	4.5671
22	502.356	12.0034	27.6927	13.9632	4.2422
23	531.212	12.3394	26.1094	14.6575	5.0981
24	546.178	14.4869	25.7864	13.9456	5.1484
25	570.256	17.9120	25.6069	13.1900	4.7684
26	585.418	19.3846	24.9325	12.5740	4.6608
27	600.238	18.9608	24.4932	12.1332	6.3877
28	614.356	18.9957	25.8293	12.0831	6.5203
29	639.486	19.1062	24.3912	13.4173	6.0350
30	653.411	18.5568	23.4195	13.5674	5.8010
31	662.863	18.1651	22.8911	13.1996	6.8667
32	679.384	17.2935	25.7099	13.1363	6.6363
33	698.26	16.7266	24.6112	14.1363	6.3569

Decomposition of variance for eagdp (continued)

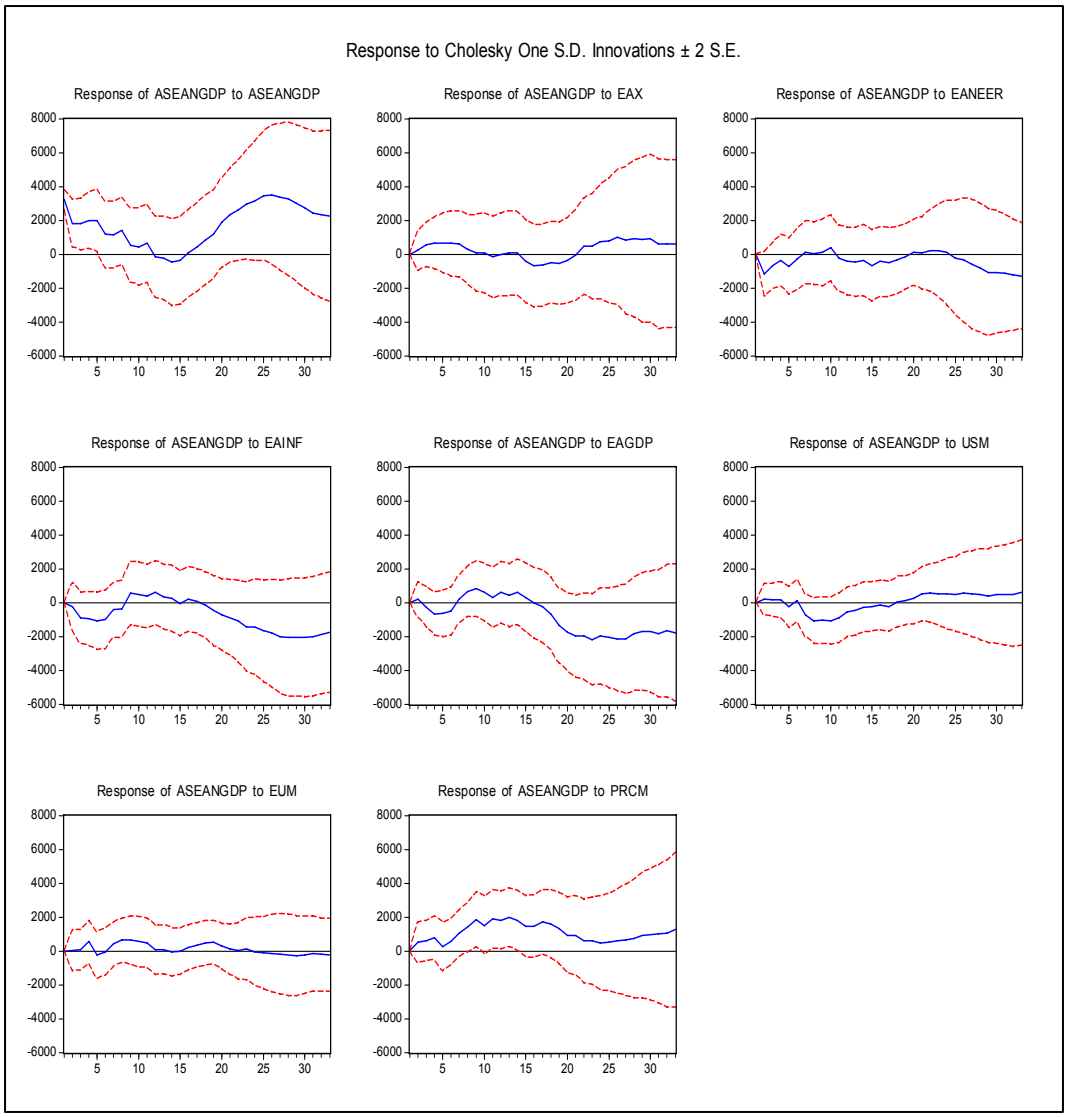
period	eagdp	usm	eum	prcm
1	23.1088	0.0000	0.0000	0.0000
2	22.0976	0.0141	0.4237	0.1467
3	19.6305	1.7955	0.4886	0.8344
4	19.0893	1.6608	0.4494	0.9153
5	18.3286	1.4082	1.1922	1.8764
6	17.4087	1.3370	1.1388	4.1464
7	17.5036	2.0296	2.4480	3.6526
8	16.3481	3.6022	2.2697	3.5331
9	21.6841	4.0237	2.6178	4.4005
10	21.7501	5.2638	2.7571	8.9049
11	21.1655	6.0543	3.6814	10.3074
12	20.1252	6.2543	3.2917	10.1528
13	22.4655	5.7029	3.1622	11.2837
14	20.9971	5.2727	2.8885	14.5443
15	20.2759	5.1079	3.3114	14.8830
16	18.9142	4.9000	3.1539	14.1436
17	19.7157	4.7647	3.0338	14.9523
18	19.3163	4.5824	3.2164	16.9682
19	20.8534	4.3494	4.0777	15.9704
20	20.7483	4.1026	3.9351	14.9832
21	19.7001	3.8868	3.8228	14.7700
22	20.1389	3.6609	3.5880	14.7106
23	21.6331	3.4525	3.4207	13.2893
24	21.3021	3.2737	3.2890	12.7679
25	19.9684	3.0234	3.3466	12.1843
26	19.2094	2.8755	3.1802	13.1830
27	19.4491	2.7395	3.2929	12.5434
28	18.6069	2.8362	3.1501	11.9784
29	18.6066	2.7995	3.1240	12.5204
30	17.8435	2.7092	3.0347	15.0679
31	18.0639	2.6343	3.3948	14.7845
32	17.2085	2.6485	3.2321	14.1349
33	17.4396	2.5389	3.2510	14.9394



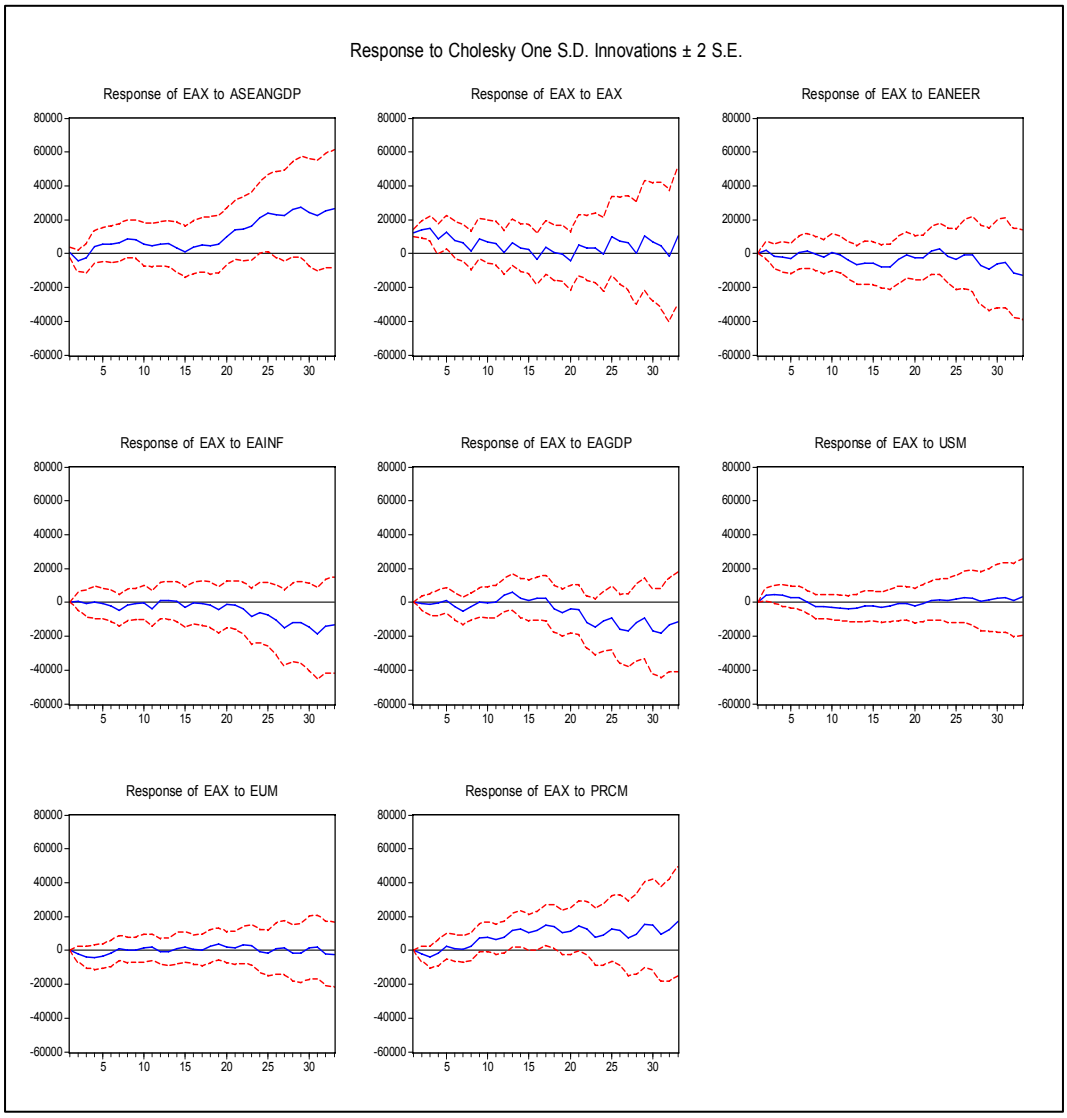
Most of the *EAGDP* variations are accounted mostly by domestic variables namely EAX, EANEER, and EAGDP. Moreover, the variations caused by the imports of China have more explanatory power on the variations on EAGDP compared to USM and EUM over the 33-quarter period.

5 Impulse Responses

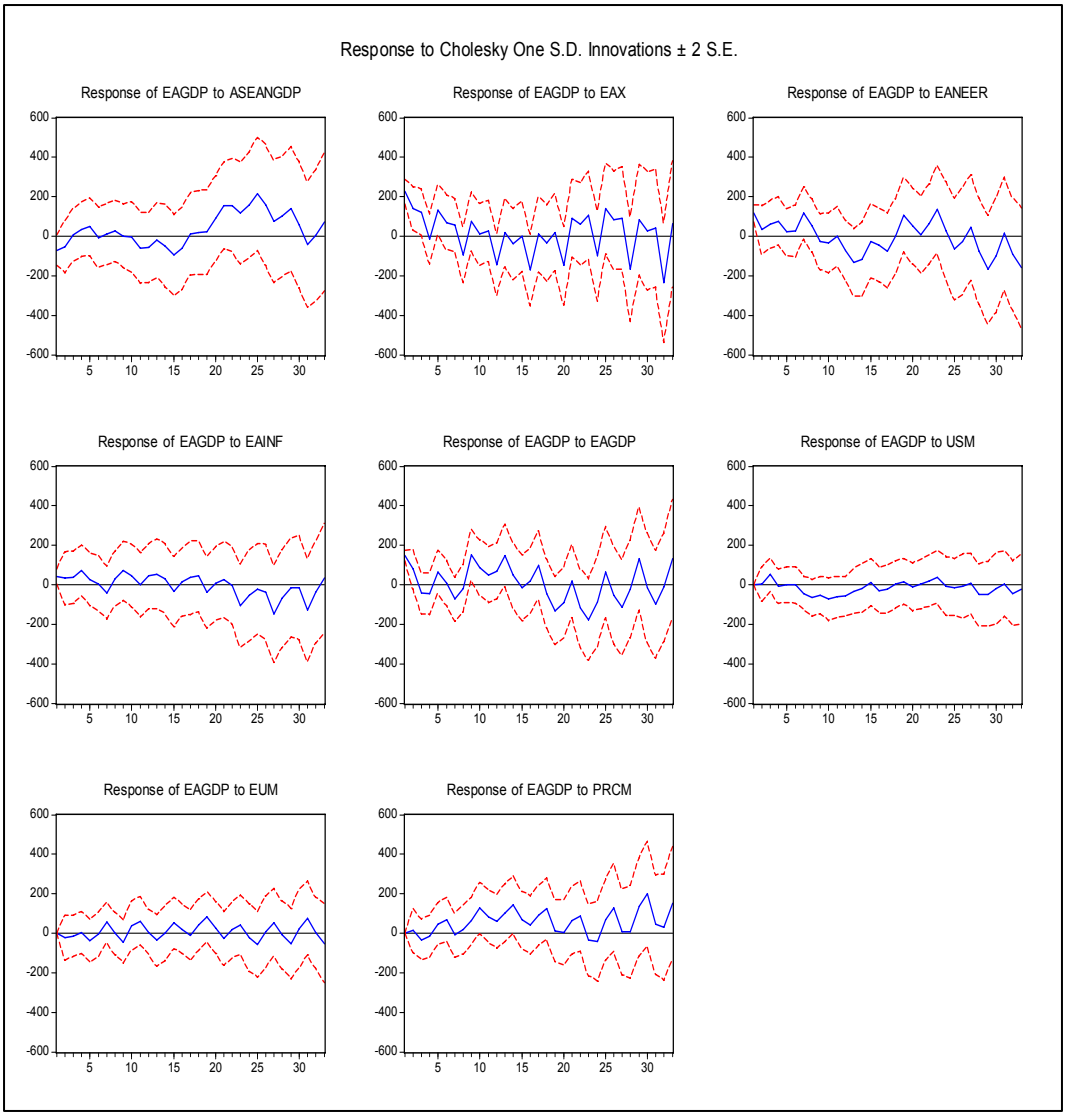
Results, at least qualitatively, are reflected in the impulse-response functions plotted. The response functions are plotted together with two standard deviation bands. Generally stated, if the bands do not encompass zero, then the responses are significantly different from zero. The results show that the significant shocks in *ASEANGDP* are coming *ASEANGDP* itself while the shocks coming from other variables are insignificant.



The results show that the significant shocks in *EAX* are coming from *USM* and *PRCM* as well as *EAX* itself. Indeed, disturbances from major trading partners seem to be the major source of the *EAX* fluctuations.



The results show that shocks in *EAGDP* are coming from the fluctuations in *EAGDP* itself.


Response to Cholesky One S.D. Innovations ± 2 S.E.
Response of EAGDP to ASEANGDP
Response of EAGDP to EAX
Response of EAGDP to EANEER
Response of EAGDP to EAINF
Response of EAGDP to EAGDP
Response of EAGDP to USM
Response of EAGDP to EUM
Response of EAGDP to PRCM

APPENDIX 7: $PRCGDP_t = f(USGDP_t, USM_t, EUGDP_t, EUM_t, EAGDP_t, PRCGDP_t, ASEANGDP_t)$

1 Optimal VAR Lag Selection

```
VAR system, maximum lag order 6

The asterisks below indicate the best (that is, minimized) values
of the respective information criteria, AIC = Akaike criterion,
BIC = Schwartz Bayesian criterion and HQC = Hannan-Quinn criterion.

lags        loglik    p(LR)       AIC          BIC          HQC

   1   -3463.40935           118.246978   121.179061   119.393877
   2   -3391.48278  0.00000  117.482759   122.125223   119.298682
   3   -3286.09745  0.00000  115.603248   121.956093   118.088195
   4   -3141.41513  0.00000  112.413838   120.477064*  115.567809
   5   -3072.89392  0.00000  111.763131   121.536738   115.586126
   6   -2946.20184  0.00000  109.173395*  120.657384   113.665414*
```

The optimal lag structure is 6 based from the lowest AIC and HQC (Gujarati, 2003). Hence, we have a VAR (6) model. Testing for higher order lag structure is infeasible due to lack of observations.

2 Johansen–Juselius Cointegration Test

```
Johansen test:
Number of equations = 7
Lag order = 6
Estimation period: 1993:2 - 2008:1 (T = 60)

Case 3: Unrestricted constant
Rank Eigenvalue Trace test p-value   Lmax test  p-value
   0    0.88814     344.59 [0.0000]     131.43 [0.0000]
   1    0.74387     213.16 [0.0000]     81.725 [0.0000]
   2    0.60568     131.44 [0.0000]     55.836 [0.0000]
   3    0.45082     75.602 [0.0000]     35.960 [0.0021]
   4    0.33143     39.643 [0.0023]     24.156 [0.0160]
   5    0.22274     15.486 [0.0486]     15.119 [0.0344]
   6  0.0060958    0.36687 [0.5447]    0.36687 [0.5447]
```

Both the trace and λ-max test rejected the null hypothesis that the smallest eigenvalue is 0 so we may conclude that the series are in fact stationary (Enders, 2003). The rejection of the hypothesis denotes the number of cointegrating equations, in this case, is at most 5. Since there is cointegration, OLS estimates of the structural relationships have the property of consistency (Mulligan, 2003).

3 VAR Estimation Results

```
VAR system, lag order 6
OLS estimates, observations 1993:2-2008:1 (T = 60)
Log-likelihood = -3037.8711
Determinant of covariance matrix = 2.2406205e+035
AIC = 111.2957
BIC = 121.8023
HQC = 115.4054
Portmanteau test: LB(15) = 964.93 (df = 441, p-value 0.000000)
```

Equation 1: prcgdp

	coefficient	std. error	t-ratio	p-value	
const	-3547.87	865.325	-4.100	0.0007	***
prcgdp_1	-0.436055	0.215725	-2.021	0.0593	*
prcgdp_2	-0.473772	0.233129	-2.032	0.0581	*
prcgdp_3	-0.276653	0.116042	-2.384	0.0290	**
prcgdp_4	1.18082	0.131752	8.962	7.52E-08	***
prcgdp_5	0.421610	0.288886	1.459	0.1627	
prcgdp_6	0.368966	0.290759	1.269	0.2215	
usgdp_1	0.0578273	0.196836	0.2938	0.7725	
usgdp_2	-0.624032	0.293545	-2.126	0.0485	**
usgdp_3	-0.336240	0.324152	-1.037	0.3141	
usgdp_4	-0.0559497	0.329515	-0.1698	0.8672	
usgdp_5	0.435677	0.241926	1.801	0.0895	*
usgdp_6	-0.279894	0.221009	-1.266	0.2224	
usm_1	0.000700767	0.00166313	0.4214	0.6788	
usm_2	0.000756116	0.00178986	0.4224	0.6780	
usm_3	0.00344113	0.00176342	1.951	0.0677	*
usm_4	-0.00174423	0.00188731	-0.9242	0.3683	
usm_5	0.00271770	0.00218013	1.247	0.2295	
usm_6	-0.00172135	0.00160043	-1.076	0.2972	
eugdp_1	-0.0642071	1.63346	-0.03931	0.9691	
eugdp_2	3.53644	1.53662	2.301	0.0343	**
eugdp_3	5.20192	1.31454	3.957	0.0010	***
eugdp_4	3.55652	1.65003	2.155	0.0458	**
eugdp_5	1.09436	1.82481	0.5997	0.5566	
eugdp_6	-1.32131	1.47398	-0.8964	0.3825	
eum_1	1.41016E-06	1.39119E-06	1.014	0.3250	
eum_2	-8.09232E-07	1.93547E-06	-0.4181	0.6811	
eum_3	-2.91633E-06	1.56506E-06	-1.863	0.0798	*
eum_4	1.25406E-06	1.44266E-06	0.8693	0.3968	
eum_5	2.29392E-06	1.77283E-06	1.294	0.2130	
eum_6	2.40810E-06	1.73143E-06	1.391	0.1822	
eagdp_1	0.0340431	0.0292536	1.164	0.2606	
eagdp_2	0.0323568	0.0357311	0.9056	0.3778	
eagdp_3	0.0271056	0.0330243	0.8208	0.4231	
eagdp_4	-0.0891658	0.0374045	-2.384	0.0291	**
eagdp_5	-0.0743989	0.0408235	-1.822	0.0860	*
eagdp_6	-0.0239203	0.0415212	-0.5761	0.5721	
aseangdp_1	0.000646893	0.00239697	0.2699	0.7905	
aseangdp_2	-0.000463961	0.00254365	-0.1824	0.8574	
aseangdp_3	0.00187768	0.00263746	0.7119	0.4862	
aseangdp_4	0.00575170	0.00255223	2.254	0.0377	**
aseangdp_5	-0.00146967	0.00275474	-0.5335	0.6006	
aseangdp_6	0.00232660	0.00253359	0.9183	0.3713	

Mean of dependent variable = 855.257
Standard deviation of dep. var. = 672.445
Sum of squared residuals = 16628.9
Standard error of the regression = 31.2757
Unadjusted R-squared = 0.99938
F-statistic (42, 17) = 648.982 (p-value < 0.00001)
Durbin-Watson statistic = 2.47419
First-order autocorrelation coeff. = -0.239272

F-tests of zero restrictions:

All lags of prcgdp F(6, 17) = 46.058, p-value 0.0000
All lags of usgdp F(6, 17) = 5.1072, p-value 0.0036
All lags of usm F(6, 17) = 2.3608, p-value 0.0764
All lags of eugdp F(6, 17) = 5.0096, p-value 0.0040

```
  All lags of eum                 F(6, 17) =   2.4814, p-value 0.0656
  All lags of eagdp               F(6, 17) =   2.9229, p-value 0.0380
  All lags of aseangdp            F(6, 17) =   2.7123, p-value 0.0492
  All vars, lag 6                 F(7, 17) =   1.3967, p-value 0.2694

For the system as a whole:

  Null hypothesis: the longest lag is 5
  Alternative hypothesis: the longest lag is 6
  Likelihood ratio test: Chi-square(49) = 231.585 (p-value 0.000000)

  Comparison of information criteria:
  Lag order 6: AIC = 111.296, BIC = 121.802, HQC = 115.405
  Lag order 5: AIC = 113.522, BIC = 122.318, HQC = 116.963
```

Conventional inference is valid even when the structural variables are nonstationary, provided the residuals are white-noise processes with no serial correlation. It is generally assumed that adding a sufficient number of lagged difference terms in the disequilibrium adjustment process is always sufficient to guarantee white-noise errors (Mulligan, 2003; Gujarati, 2003).

It can be seen from the results that all variables as well as several lags are significant in influencing *PRCGDP*.

4 Variance Decomposition

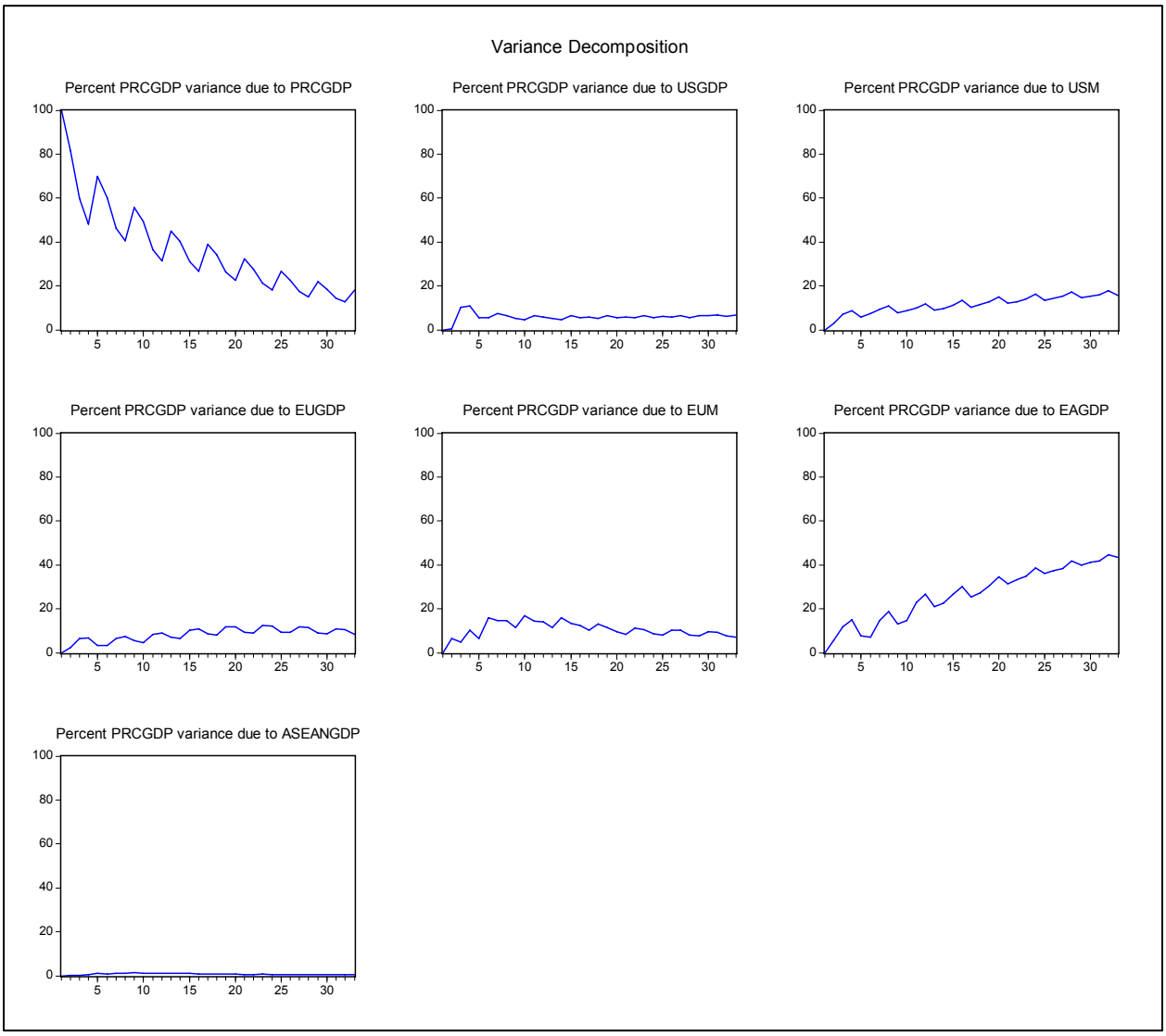
Decomposition of variance for prcgdp

period	std. error	prcgdp	usgdp	usm	eugdp
1	16.6478	100.0000	0.0000	0.0000	0.0000
2	19.9345	81.6156	0.5768	2.9308	2.2688
3	23.7288	59.7036	10.1954	7.1857	6.4171
4	26.6012	48.1365	10.8613	8.7750	6.6294
5	37.5084	69.8479	5.4947	5.9902	3.3365
6	44.1804	60.1948	5.4525	7.4636	3.1753
7	50.5333	46.3010	7.3316	9.2007	6.5931
8	54.0871	40.6008	6.6219	10.8657	7.4713
9	65.3607	55.5996	5.2742	7.8766	5.3691
10	72.2196	49.3774	4.4937	8.7014	4.5749
11	84.2011	36.5758	6.4094	10.0357	8.4934
12	91.0799	31.5309	5.7539	11.9752	8.9683
13	105.486	44.9458	5.2889	8.9369	7.1975
14	113.476	40.1529	4.5869	9.7730	6.3462
15	129.254	31.0658	6.3413	11.1822	10.3187
16	141.31	26.5680	5.6575	13.5524	10.8330
17	162.245	38.8073	5.6994	10.3607	8.7713
18	173.514	34.2842	5.2215	11.3802	7.9920
19	197.684	26.4138	6.4433	12.6510	11.8101
20	218.141	22.5026	5.5244	15.1265	11.8614
21	247.789	32.2378	5.7790	12.0505	9.4541
22	267.236	27.7351	5.5108	12.8390	8.9298
23	305.849	21.2939	6.3453	13.8916	12.3106
24	339.546	18.2406	5.4693	16.3814	12.0488
25	384.234	26.5019	6.0323	13.5362	9.4378
26	418.632	22.4103	5.8864	14.2373	9.1508
27	480.389	17.3759	6.4098	15.1455	11.8799
28	537.523	15.1164	5.6701	17.2345	11.5626
29	608.423	21.8267	6.4047	14.6529	9.0423
30	670.573	18.3225	6.3287	15.2440	8.8286
31	771.122	14.4982	6.7129	16.0542	10.8424
32	869.301	12.9017	6.0824	17.8103	10.5441

33	985.354	18.1368	6.8016	15.6519	8.3556

Decomposition of variance for prcgdp (continued)

period	eum	eagdp	aseangdp
1	0.0000	0.0000	0.0000
2	6.5984	5.9090	0.1006
3	4.7376	11.6862	0.0745
4	10.1654	15.0979	0.3345
5	6.6121	7.6074	1.1112
6	15.9321	6.9458	0.8359
7	14.6690	14.7190	1.1857
8	14.6692	18.7361	1.0350
9	11.4312	13.0613	1.3881
10	16.9295	14.7449	1.1782
11	14.3532	22.9593	1.1732
12	14.0398	26.7282	1.0038
13	11.6675	20.8554	1.1080
14	15.7795	22.4037	0.9578
15	13.4477	26.6603	0.9839
16	12.3488	30.2020	0.8383
17	10.2320	25.3269	0.8025
18	13.0105	27.4081	0.7036
19	11.4091	30.5171	0.7556
20	9.7319	34.5881	0.6650
21	8.5019	31.3716	0.6052
22	11.2765	33.1826	0.5262
23	10.7032	34.7977	0.6577
24	8.7092	38.5726	0.5781
25	7.9625	36.0119	0.5174
26	10.3929	37.4863	0.4359
27	10.1405	38.4601	0.5884
28	8.1176	41.7697	0.5289
29	7.6037	39.9870	0.4827
30	9.5529	41.3190	0.4043
31	9.4520	41.8940	0.5464
32	7.5836	44.5709	0.5070
33	7.2043	43.3789	0.4709



Most of the *PRCGDP* variations are accounted mostly by *EAGDP* explaining more than 70 percent after the first quarter and more than 20 percent at eleven quarter horizon onwards. Comparatively, the disturbances in the *USGDP* and *EUGDP* have more explanatory power in accounting for variations in *PRCGDP* than *ASEANGDP*. On the other hand, *USM* have more explanatory power than *EUM*.

5 Impulse Responses

Results show that the shocks in *PRCGDP* caused by all variables of interest are significant at earlier periods and dissipate after 10 to 15 quarters. Indeed, the ASEAN, US, and EU markets cause disturbances to the Chinese economy at varying magnitude.