

ASEAN+3 RESEARCH GROUP

Toward Greater Financial Stability in the Asia Region: Exploring Steps to create Regional Monetary Units

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Executive Summary

1. We construct the RMU for ASEAN5+3 (RMU8: Indonesia, Malaysia, Philippine, Singapore, Thailand, Japan, South Korea and China) and compare that to Ogawa and Shimizu (2005) RMU based on thirteen countries (RMU13: RMU8 plus Indonesia, Brunei, Cambodia, Laos, Myanmar and Vietnam). All the 8 countries have the potential of establishing a workable framework for international trade and economic cooperation to facilitate formation of AMU. There at least three reasons for dropping Brunei and the CLMV countries: a) Reliable macroeconomic data over a span of 15 years is not readily available; b). most of them is in their transition period and the financial sector is in their early development stage; and c) the cost of acquiring relevant data may be substantial.

We find no significant different between RMU13 and RMU8 arrangements. First, the time profile of the RMU8 series is able to track closely (with no delay) the major turning points of the RMU13. The distance between the two series appears to be constant. Second, we test for equality of conditional variance for the two RMUs, and all tests reveal that there is no statistically significant different between the two arrangements. In our view, the adoption of RMU8 for monitor misalignment and exchange rate volatility within the region will indeed be cost saving. This is no surprise as the weight attached to the excluded countries in Ogawa-Shimizu's computation for RMU13 is small.

2. A high degree of policy convergence among member countries is crucial if an Asian Monetary Union (AMU) is to be initiated and sustained the participation through necessary macro policy adjustments. We tests for convergence among the core countries based on a long-run dynamic framework in order to determine the compatibility of the grouping and the feasible of pegging to RMU8. Besides that, a rolling cointegration methodology proposed by Brada, Kutun and Zhou (2005) is deployed to determine which country is more compatible within the group (Japan benchmark—indicator of AMU policies and performance). From our analyses, we conclude that the following sequence of forming the AMU:

- Stage 1 – Japan, South Korea, Singapore, Malaysia, Thailand and the Philippines
- Stage 2 – Enlargement include China and Indonesia and Brunei
- Stage 3 – Cambodia, Laos, Myanmar and Vietnam

3. **Basic Statistics:** Macroeconomic performance will play a key role in determining which of the economy will join RMU and when, and their ability to sustain participation. Among the macroeconomic indicators that most observers would view important for a credible currency program are inflation rate, the current account, macroeconomic policy, interest rates, productivity and employment and indebtedness, to name a few.

We recommend that the secretariat of the ASEAN+3 take the initial effort in compiling these data. These data should be collected on timelier basis. It will provide the policymakers with up-to-date information about the economic outlook in the region. The importance of these statistics as an analytical information cannot be underrated. For example, a simple correlation analysis on interest rate spread will provide indication on the degree of convergence. This information will also identify leading candidates for grouping in term of progress made. Some macroeconomic

data are readily available from: *World Development Indicators* by World Bank; *International Financial Statistics* by IMF; *Key Indicators of Developing Asian and Pacific Countries* by ADB; *SEACEN Financial Statistics-Money and Banking* by The SEACEN Centre; and *Statistical Bulletin* and websites from the respective Central Banks.

The following lists of data are needed for the construction of the RMU:

Gross domestic product, nominal
Consumer price index, wholesale price index
GDP deflator
Total import, direction of imports
Total export, direction of exports
Bilateral exchange rate: US\$-Yen, US\$-Yuan, US\$-Won, US\$-Ringgit US\$-Peso, US\$-Baht, US\$-Sing Dollar, US\$-Rupiah, US\$-Euro
Money supply (M0, M1, M2)
Interest rates, both short-term and long-term (lending and deposit rates)
Investments (short and long-term)
Budget deficit
Current account

4. From the European experience, the initial functions of the ECU are part of its role in the European Monetary System (EMS). It is the means of settlement for the EU monetary authorities. It is the denominator for the Exchange Rate Mechanism (ERM) and for operations under EMS credit mechanisms. It serves as the basis for the divergence indicator. The additional official uses that have developed within the EU and which the AMU can emulate, comprises of the following

- (a) use as a reserve currency;
- (b) use as a means of payment and settlement;
- (c) use in the AMU budgets, for AMU grants, loans and fines, for services and for the salaries of AMU officials;
- (d) use in the common agricultural policy;
- (e) use by the Investment Bank;
- (f) use in the Development Fund; and
- (g) use as denominator for customs duties.

5. In the EU, one of the most promising developments in the monetary field has been the acceptance of the ECU as a denominator for private and commercial financing instruments on the international markets. This development of the private ECU is important for entities involved in business with the EU. There are a number of reasons which explain the favorable development of the ECU despite the lack of official sanctioning. First, the ECU has a very stable exchange rate toward third currencies. We compare the volatility behavior between RMU\$ and exchange rate vis-à-vis the US\$ and found that for all eight countries, the variability in terms of US dollars is higher than that of RMUs for all currencies. Second, the interest rates for ECU instruments are EMS currencies. Third, as a result of the non-existence of a central monetary authority, there are only a few regulations for the private and commercial uses. The individual central banks

established a basic legal and institutional framework which has made the ECU an attractive investment vehicle.

The following are some (not all) of the uses of private ECUs which the AMU can emulate in the later stages:

a). Bond Market. The ECU bonds have secured themselves a significant share in the market for Eurobonds and international bond issues. In 1991, the ECU was the third most used denomination on the international bond markets with three main categories: (i) strictly domestic government bond issues; (ii) domestic/international government bond issues; and (iii) purely international bond issues in the Euromarket. The ECU bond market offers most of the bond types available in traditional bond markets (Fixed Rate Bonds, Adjustable Rate Bonds, Zero Coupon Bonds, Floating Rate Notes, Convertible Bonds, etc.).

b). Money Market. The ECU money market for bank liabilities, medium term notes, certificates of deposit, commercial papers, and Treasury bills has been the single fastest growing segment of the ECU market with a total market volume of over ECU 140 billion.

c). Government Debt Market. Traditionally, the ECU market was split equally between issues by corporations and issues by government entities (national and local governments, supranational institutions and government enterprises). Issues by government entities now represent approximately 75 % of the primary market in ECU bonds.

d). Private Non-Bond Markets. The private ECU non-bond markets include loans, foreign exchange markets, investment funds, insurance and other instruments.

1.0 Introduction

1.1 Motivation of issues

The Asian crisis of 1997-1998 revealed two types of risks to financial stability in the region. First is the risk arising from the widely observed vulnerability in bank and corporate balance sheets. In particular, severe currency mismatches in balance sheets can make the whole economy susceptible to so-called ‘twin crises’. Second is the risk of contagion due to the absence of effective policy coordination in the region. The case for regional cooperation is particularly strong in East Asia where the economies are highly integrated and thus financial instability can spread rapidly across region.

To alleviate these risks, increasing efforts have been made to strengthen regional financial cooperation within the ASEAN+3 frameworks, such as the Chiang Mai Initiative (CMI) and the Asian Bond Markets Initiative (ABMI). To further promote and deepen regional financial cooperation, an introduction of a common benchmark for the region will be crucial. It is against this background that there is a growing interest in the creation of regional monetary units. The research report in 2005-05 “Regional Coordination of Policy Measures Forward: Financial Market Liberalization of Capital Market Development” also has referred currency baskets named as “Asian Monetary Units”.

There are two major advantages to creating and using the regional monetary units. First, the regional monetary units can serve as a useful benchmark for the Asian monetary authorities to monitor exchange market developments. For instance, the regional monetary units can be used as an indicator to monitor the movement of Asian currencies *vis-a-vis* other key currencies such as the U.S. dollar and the euro, and also to monitor the individual movement of each Asian currency against the regional average presented by the regional monetary units. Second, for private-sector market participants, a well-designed regional monetary units index (e.g. core-regional monetary units) will prove to be useful as the denomination of market transactions, such as bond issuance, and also contribute to ABMI activities. The widespread and voluntary use of the monetary units to denominate trade transactions and financial instruments may help to reduce currency mismatches in the balance sheets and thus mitigate the risk of a crisis like that seen in Asia in 1997-1998, as well as promote closer regional integration.

1.2 Description of project

There is a large literature on economic integration and economic union pertaining to the developed countries in particular the European Union (EU). Prior to the introduction of the single currency Euro, the European Currency Unit (ecu) has been adopted as the parallel currency in the EU. A similar body of work is beginning to emerge for the Asian countries. The present study brings to bear this literature to provide guidance to policy makers in the ASEAN+3 economies. Our approach is to illuminate the important issues on the use of Regional Monetary Units (rmu) in the ASEAN+3 economies by providing updated and illustrating experiences and lessons from Europe before the adoption of the single currency. Apart from the survey of literature, we also provide some empirical support on the choice of countries to form the earlier Asian Economic Community, and then draw out policy conclusions and recommendations to address key questions.

This study aims to achieve the following objectives by analyzing the issues from theoretical and empirical perspectives:

- 1) Explore the possibility of creating regional monetary units-related financial instruments, such as bonds and mutual funds as well as mechanisms to facilitate the use of regional monetary units for trade transactions.
- 2) Examine the desirable structures of the regional monetary units such as the composition, weights and the procedure for their revisions, as well as the fair value of the currencies included in the basket, which comply with the various uses.
- 3) Identify the gaps in existing economic and financial statistics which need to be filled for the creation of effective regional monetary units as well as the parties responsible for the collection and compilation of such data.
- 4) Discuss a market-oriented approach to the promotion of the regional monetary units by the public sector.
- 5) Discuss the possible roles of the regional monetary units in official transactions among ASEAN+3 countries.

1.3 Organization

A background of the ASEAN+3 economic co-operation and integration, rational for economic co-operation, as well as some key economic indicators among the East Asian economies are presented in Section 2. In Section 3, after a brief review of optimum currency areas and related studies, and East Asia and Asia-Pacific co-operation, we present our methods for testing the real and monetary compatibility of ASEAN 5 + 3, as well as report the empirical finding.

We then present in Section 4 our estimations of the macroeconomic compatibility of ASEAN 5 + 3, by looking at the composition of regional monetary unit. We also compare the composition of regional monetary unit between ASEAN 10+ 3 and ASEAN 5 + 3 by examining the volatility and variance inequality. Lastly, we compare the volatility behaviour of East Asian currency in terms of AMU and US dollar.

In Section 5, we discuss the regional monetary unit as official and private use based on the European Currency Units experience. In the final section we highlight the data requirement of regional monetary unit of East Asian region.

2.0 ASEAN+3 Economic Co-operation and Integration

A stable and sustainable economic growth, along with low manageable inflation and unemployment rates are aspirations of many economies, developed and developing alike. The European Union (EU), currently has a composition of 25 member countries, aims to achieve all that through ongoing monetary and economic co-operation, a strategy to head towards free as

well as open trade and investment. Being relatively small in size individually, economic and monetary co-operation within the Euro land provides greater international trade and investment opportunities, which in turn, creates jobs, enables greater consumption demand and ensuring sustainable economic growth. Free and open trade helps to lower the costs of production and reduce prices of goods and services. In contrast, protectionism keeps prices high and fosters inefficiencies.

On witnessing the progressive monetary co-operation of the European Monetary Union (EMU), any leader of substantial calibre would want to do the same for his or her country in order to strengthen its economic presence in the international arena. The idea to form an economic block within the East Asian region was formally put forward by the former Prime Minister of Malaysia, Tun Dr Mahathir Mohamad in late 1990. His proposal to form an East Asian Economic grouping, which was modified to the East Asia Economic Caucus (EAEC), in alliance to the Asia-Pacific Economic Co-operation (APEC), was nothing but rational.

EAEC was intended to integrate nations within the East Asian region to encourage trade, increase exchange of money, people and information, (including ideas, culture and language). The EAEC aims to promote trade and economic growth within East Asia. After all, the United States was able to form the North American Free Trade Area (NAFTA), a sub-regional arrangement of APEC, why not EAEC? The EAEC did not materialise. The first unforeseen obstruction was the exclusion of the US in the EAEC. Since the United States (US) was not an Asian country, naturally it was not included in EAEC. Hence, the US disapproved of EAEC. Secondly, Japan, which would not compromise its close alliance with the US, was not supportive of the idea of forming an economic bloc without the participation of the US. Besides, there was no consensus among the Association of Southeast Asian Nations (ASEAN) members on the leadership of EAEC (Naoko, 2002).

APEC, on the other hand, established in 1989, was to further enhance economic growth and prosperity for the region and to strengthen the Asia-Pacific community. Its notable vision is the 'Bogor Goals' of free and open trade and investment in the Asia-Pacific by 2010 for industrialised economies and 2020 for developing economies. These goals were jointly agreed upon by leaders of member economies at the APEC 1994 meeting in Bogor, Indonesia.

However, by itself, APEC consists of a vast list of 21 member economies of Australia, Brunei Darussalam (hereafter known as Brunei), Canada, Chile, The People's Republic of China (hereafter known as China), Hong Kong China, Indonesia, Japan, South Korea (hereafter known as Korea), Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, The Republic of the Philippines (hereafter known as Philippines), The Russian Federation, Singapore, Taiwan, Thailand, US and Vietnam. The EMU took more than half a century to adopt euro among 12 of its then 15 member economies in 1999. APEC with its current 21 members of diverse economic, political and social background can therefore expect a longer and intricate progress in achieving notable economic co-operation.

As such, to complement, rather than substitute APEC, an East Asian regional co-operation within APEC would be a sensible approach to quicken the pace of strengthening economic co-operation and to achieve the Bogar goals. Moreover, in October 2004, APEC leaders considered that

Regional Trade Agreements (RTAs) and Free Trade Agreements (FTAs) play a constructive role in accelerating liberalisation in the region, thus contributing to the achievement of the Bogor goals and advancing to the World Trade Organisation (WTO) process. They are also committed to greater transparency in these trade arrangements to facilitate public understanding of the scope and effect of these agreements.

The 1997 Asian financial crisis had cause several economies in East Asia to plunge into recession. It has triggered the need for closer regional co-operation, much more than before. The effect of the crisis itself has accelerated discussions, negotiations and agreements of FTA and RTA within the East Asian region (Elliott and Ikemoto, 2004). Besides, from the financial crisis, East Asian realised that they could not rely heavily on the US for assistance (Nasution, 2005), but themselves. Some scholars view that, the US now has no reason to stand against an East Asian regional co-operation.

East Asian economies that are actively working towards an East Asian regional co-operation are Japan, China, Korea and the five founding ASEAN members, Indonesia, Malaysia, Philippines, Singapore and Thailand (hereafter known as ASEAN-5). Regional co-operation of ASEAN-5 with Japan, China and Korea, are known as ASEAN-5 + 3. To the best of our knowledge, there has been no study that examined the compatibility, specifically, the convergence of the Japanese, Chinese and Korean economies with ASEAN-5 economies, an utmost economic co-operation condition. Many scholars agreed that a regional co-operation within the region, namely East Asia within APEC, would quicken the pace of economic integration in the Asia-Pacific or even Asian region. Nonetheless, there has been no specific consensus on which economies should initiate the regional co-operation.

2.1 Rational for economic co-operation

Economic integration focuses on strengthening existing and new international linkages of commerce and trade (Daniels and VanHoose, 2001). Economic integration (or union) refers to economic linkages or interdependence between states, countries, grouping of countries or regions. The flow of trade (exports and imports of goods and services), capital (direct and portfolio investments), labour and technology across countries are evidence of economic linkages (O'Neill, 2002). The theory of economic integration further explains that the reduction or elimination of trade barriers among nations (Salvatore, 2004) will eventually bring together the commodity market, financial market (Coleman, 1999; O'Neill, 2002) and labour market (O'Neill, 2002) of the economies involved.

Based on these explanations on economic integration, East Asia's current regional co-operation may not be anywhere near an economic union, but its efforts to forge closer regional co-operation are apparent. The problems faced by several East Asian economies, have prompted for stronger multilateral co-operation within neighbouring countries for solutions (Day and Herbig, 1995; Naoko, 2002; Cheng, 2004).

To begin with, during the 1997 Asian financial crisis, ASEAN considered the US and APEC unhelpful. Financial assistance and advice from the IMF were followed by rigid and

unfavourable conditions. Malaysia, for one, decided to unwind its financial problems internally, behind protective barriers, and succeeded by adopting contrary recommendations from the IMF (Cheng, 2004). ASEAN, as a regional organisation, weakened by the Asian crisis, perceived the ASEAN 5 + 3 co-operation as an important means to re-establish and strengthen ASEAN's status and relevance (Cheng, 2004)

Besides the 1997 Asian financial crisis, transnational issues such as international terrorism, environmental protection, drug-related crimes as well as natural catastrophes such as the tidal waves, tsunami, a result of the quakes in Aceh, the quake in South Asia and the outbreak of diseases (like the Severe Acute Respiratory Syndrome, SARS, and the avian flu) have highlighted the need for regional co-operation to avoid (or mitigate) the aggravation of adverse shocks.

Thirdly, it is about time that Asia, East Asia typically, be given a more equal footing as the US and Europe in voicing and effectively manage global issues (Soesastro, 2003). Some global issues that are of concern includes issues such as war (whether it is against terrorism or otherwise), containing the outbreak of diseases, tariff and trade negotiations, as well as research and development. Moreover, the development of an East Asian regional identity would help strengthens APEC and meet APEC's Bogor goals.

The capability of East Asia to replicate the EMU model may not be as straightforward. The EMU took about fifty years to adopt the euro, even though their size and locality provided them the right incentive to work together for the good of a common market. Additionally, most Europeans are of similar cultures, they are from the Roman and Greek origins, embrace Christianity (the main religion), adopt the democratic economic system and are well-developed economies. The EMU is a rather balanced community where four of its major members, the United Kingdom (UK), France, Italy and Germany, have comparable population, size, resources and economies (Day and Herbig, 1995).

In the case of East Asia, their characteristics may initially seem very diverse as compared to the Europeans, but they do have some common grounds to work out their differences. Firstly, East Asian economies are mainly democratic economies (perhaps with the exception to North Korea, Myanmar and China), located within the Asia-Pacific region, and have a huge market opportunity that could bring about the possibilities of working together for economic prosperity and well-being. Even though the prime advantage of maintaining a separate currency across countries is the ability to smooth business cycle fluctuations through independent and counter-cyclical monetary policy, their high degree of business cycles correlation and the huge amount of trade, signal for a possible economic and monetary co-operation (Coleman, 1999).

2.2 Key economic indicators

The level of economic development differs among APEC members. Three economies with the highest gross domestic product (GDP) per capita are the US with USD39,991.00, Japan USD36,184.00 and Australia USD30,695.00, while the three poorest are Indonesia, Papua New Guinea and Vietnam, with USD1,003.00, USD686.00 and USD494.00 respectively. The US, Japan and China are three economies with the largest market demand with GDP of USD11,750.4

billion, USD4,621.2 billion and USD1,601 billion, respectively. However, the combination of ASEAN-5's total exports and imports indicate a total of USD460,617 million and USD393,491 million, respectively. Except for the US, the amount of exports and imports for ASEAN-5, is the highest as compared to each APEC member economies, individually. These key indicators of APEC are presented in Table 2.1.

All ASEAN nations, except for Myanmar and Laos, where data were unavailable, indicate a relatively comparable economic setting. Table 2.1 reveals a steady increase in population with Indonesia being the most populated nation in ASEAN, recording a 216.4 million people in 2004, and Singapore the least, of 4.24 million people in 2004.

Table 2.1 : Key Indicators of APEC

Member economy (Year joined)	Area ('000 sq km)	Population (million)	GDP (US\$bn)	GDP per capita (US\$)	Exports (US\$m)	Imports (US\$m)
Australia (1989)	7,682	19.5	622.7	30,695	70,779	93,200
Brunei Darussalam (1989)	6	0.36	5.2	14,352	3,996	1,859
Canada (1989)	9,971	31.3	970.3	30,439	271,572	263,324
Chile (1994)	757	15.6	89.3	5,571	21,461	19,413
China (1991)	9,561	1,294	1,601	1,227	438,473	413,096
Hong Kong, China (1991)	1	7	164	23,592	228,654	233,194
Indonesia (1989)	1,904	217.5	222	1,003	72,360	43,211
Japan (1989)	378	127.5	4,621.2	36,184	471,913	383,361
Korea (1989)	99	47.4	667.4	13,806	193,817	178,827
Malaysia (1989)	333	23	112.5	4,418	120,693	99,600
Mexico (1993)	1,973	101.8	663.1	6,377	156,422	165,410
New Zealand (1989)	271	3.8	92.9	23,120	16,261	18,466
Papua New Guinea (1993)	463	5.7	4.0	686	3,585	1,367
Peru (1998)	1,285	26.5	66.2	2,290	8,420	8,162
Philippines (1989)	300	78.6	84.2	1,019	43,190	47,005
Russia (1998)	17,075	143.8	517.8	4,016	132,089	62,869
Singapore (1989)	1	4.2	103.6	23,999	144,121	127,996
Chinese Taipei (1991)	36	22.5	307.5	13,359	144,059	127,506
Thailand (1989)	513	64.3	165.7	2,556	80,253	75,679
United States (1989)	9,373	288.5	11,750.4	39,991	724,771	1,257,121
Vietnam (1998)	331	80.2	40.4	494	20,838	25,773

Source : APEC Secretariat (2005).

Table 2.2 that was extracted from the World Development Indicator database compiled by the World Bank, however, provided a better set of information for comparison within ASEAN-5. The aggregate output of ASEAN-5 computed were real GDP and real GDP per capita based on the purchasing power parity (PPP) elaborated by Kravis, *et al.* (1978) and Salazar-Carrillo and Alonso (1988).

Singapore, being the smallest and least populated in Southeast Asia, its real GDP per capita (at PPP) is way ahead of the other four ASEAN-5 members, especially Indonesia. Although, the real GDP at PPP for ASEAN-5 tells the same story, the difference between aggregate output has narrowed down quite substantially in recent years.

Table 2.2 : Aggregate output of ASEAN-5

Real GDP at PPP (in million USD)						
Year	Indonesia	Malaysia	Philippines	Singapore	Thailand	
1990	2,304.22	556.95	984.86	407.33	1,169.21	
1991	2,247.30	594.93	749.07	464.53	1,254.76	
1992	2,173.53	672.28	763.36	528.37	1,354.26	
1993	2,112.58	730.17	706.02	608.43	1,463.68	
1994	2,060.56	775.34	727.21	710.67	1,573.67	
1995	2,021.30	888.32	741.20	839.31	1,679.00	
1996	2,007.56	969.22	717.34	923.58	1,670.40	
1997	1,711.35	934.88	651.23	939.70	1,272.80	
1998	309.39	617.24	434.76	823.65	820.39	
1999	320.31	655.22	455.96	835.88	911.13	
2000	325.18	748.35	431.41	945.45	916.31	
2001	250.62	730.10	373.95	884.38	858.29	
2002	250.84	771.86	386.74	927.78	946.29	
Real GDP per capita at PPP (in USD)						
	Indonesia	Malaysia	Philippines	Singapore	Thailand	
1990	28	54	51	134	46	
1991	32	58	43	141	48	
1992	31	61	39	144	51	
1993	28	64	37	163	54	
1994	28	67	36	171	56	
1995	28	71	34	179	59	
1996	28	75	33	190	60	
1997	27	78	32	193	57	
1998	16	68	29	190	48	
1999	13	71	28	205	50	
2000	13	77	28	228	52	
2001	12	75	27	218	53	
2002	11	76	27	229	56	

Source : World Development Indicator 2004.

Nonetheless, with reference to Table 2.3, the structure of output measured as the percentage of GDP at market prices also varies among ASEAN nations. Cambodia's output structure was 55.6% agricultural, 11.2% industrial and 33.2% services in 1990 but became less agricultural-base in 2003 where its output structure was 36.0% agricultural, 27.6% industrial and 36.4% services. However, there are not much changes in the output structure for Indonesia and Laos. For Indonesia, 19.4%, 39.1% and 41.5% of its GDP in 1990 were made up of the agriculture, industry and service sectors respectively, as compared to 15.4% agricultural, 43.7% industrial and 40.9% services in 2004. In the case of Laos, 61.2%, 14.5% and 24.3% of its GDP in 1990 were made up of the agriculture, industry and service sectors respectively, as compared to 48.6% agricultural, 25.9% industrial and 25.5% services in 2003.

As for Malaysia, the structure of output measured as the percentage of GDP at market prices revealed a fall in the contribution of agriculture output, from 15% in 1990, to 12% in 1995 and 9.1% in 2004. Malaysia's output structure is geared towards industrialisation, 41% in 1995 and

48.5% in 2004, as well as the service sector, 47% in 1995 and 42.4% in 2004. Myanmar, however, remained as an agricultural based economy since 1990 where 54.6%, 13% and 32.4% of its GDP came from the agricultural, industrial and services sector, respectively in 2002.

The service sector continued to be Singapore's, Philippine's, Thailand's and Vietnam's main source of aggregate output, contributing 66.2%, 52.8%, 46.0% and 38.2% of their total GDP in 2004, respectively. The agriculture sector of these countries was less eminent. However, the level of development and industrialisation of Singapore are more prominent than other ASEAN countries. Within ASEAN, Singapore is a leader of high-tech industries, while Vietnam exports low-tech manufactured goods.

Table 2.3 : Key Indicators of Selected ASEAN.

Country	Year	Population (Million)	Structure of output, % of GDP at market prices.			External Debt as % of GNI
			Agriculture	Industry	Services	
Cambodia	1990	8.60	55.6	11.2	33.2	165.51
	1995	10.47	50.4	15.0	34.6	78.60
	2002	13.0	35.6	28.0	36.4	75.7
	2003	13.3	36.0	27.6	36.4	77.3
	2004	13.5	N/A	N/A	N/A	N/A
Indonesia	1990	179.38	19.4	39.1	41.5	63.98
	1995	194.75	17.1	41.8	41.1	63.41
	2002	211.06	16.0	44.6	39.4	78.8
	2003	213.7	15.9	43.6	40.5	67.5
	2004	216.4	15.4	43.7	40.9	N/A
Laos	1990	4.14	61.2	14.5	24.3	204.51
	1995	4.60	55.2	19.1	25.7	123.18
	2002	5.53	50.3	24.7	25.0	157.3
	2003	5.68	48.6	25.9	25.5	136.6
	2004	5.84	N/A	N/A	N/A	N/A
Malaysia	1990	18.10	15.0	42.0	44.0	36.36
	1995	20.69	12.0	41.0	47.0	40.55
	2002	24.53	8.8	45.20	46.0	55.1
	2003	25.05	9.3	46.4	44.3	50.2
	2004	25.58	9.1	48.5	42.4	N/A
Mynmar	1990	41.00	57.0	11.0	32.0	N/A
	1995	45.00	60.0	10.0	30.0	N/A
	2002	52.17	54.6	13.0	32.4	N/A
	2003	53.22	N/A	N/A	N/A	N/A
	2004	54.3	N/A	N/A	N/A	N/A
Philippines	1990	62.05	21.9	34.5	43.6	69.36
	1995	70.27	21.6	32.1	46.3	49.67
	2002	80.2	15.1	31.8	53.1	72.3
	2003	81.8	14.8	31.9	53.3	72.4
	2004	83.5	15.3	31.9	52.8	N/A
Singapore	1990	3.05	0.3	33.0	67.7	12.37
	1995	3.53	0.2	33.3	65.3	9.77
	2002	4.17	0.1	31.9	68.0	23
	2003	4.19	0.1	32.1	67.8	N/A
	2004	4.24	0.1	33.7	66.2	N/A
Thailand	1990	55.84	12	37	50	33.00
	1995	59.4	11	39	50	61.00
	2002	63.14	9.4	42.4	48.2	47.6
	2003	63.66	10.0	43.5	44.1	36.9
	2004	64.2	9.9	44.1	46.0	N/A
Vietnam	1990	66.00	39.0	23.0	39.0	384.00
	1995	72.00	27	29	44	124.00
	2002	79.73	23.0	38.5	38.5	38.00
	2003	80.9	22.5	39.5	38.0	40.4
	2004	82.02	21.8	40.0	38.2	N/A

Note : N/A means data not available

Source : Asian Development Bank Key Indicators 2005.

Besides the incomparable product market, another obstacle to integrate ASEAN economies is the unequal financial markets advancements among member countries. The financial system in Singapore and Malaysia, for instance, are much more liberalised and developed, as compared to other ASEAN member countries like Vietnam, Laos and Myanmar (Bayoumi, Eichengreen and Mauro, 2000).

The dissimilarity of the level of economic development and monetary systems is therefore said to be the main obstacle to the adoption of policies to support economic and monetary integration (Bayoumi *et al.*, 2000). However, countries with diverse economic background and comparative advantages will complement one another, promote trade and maintain a sustainable economic growth. Regional co-operation in the form of FTAs and other special regional or preferential trading arrangements has proven favourable results as seen in the intra-ASEAN trade. Without much estimation, the comparison of ASEAN's trade in Table 2.4 revealed a gradual increase in intra-ASEAN trade, in value, from 1995 to 2000, except for the financial crisis year 1998. Still, the September 11 event in 2001 had also adversely affected the intra-ASEAN trade for all ASEAN countries, except for Brunei and Myanmar.

Besides, from 1995 to 2003, Singapore was the main intra-ASEAN exporter, to be followed by Malaysia and third Thailand. In 1995, approximately 30% of Singapore's total exports were to ASEAN. In addition, Malaysia and Brunei exported about 27% and 19% of its total exports, respectively to ASEAN. However, in 2003, 68.6% of Myanmar's exports were Intra-ASEAN exports, while 26.8% and 25.0% of Malaysia and Singapore's export, respectively, were Intra-ASEAN exports. Table 2.4 provides the figures for intra-ASEAN exports for all ASEAN countries, except for Vietnam and Laos, for the period from 1995 to 2001.

Similarly, Singapore remained as the main intra-ASEAN importer since 1995 up to 2003, to be followed by Malaysia and third Thailand. In 1995, approximately 47.5% of Brunei's imports were from ASEAN, while 22.3% and 17.5% of Singapore and Malaysia's imports, respectively, were from ASEAN. In 2003, 58.3% of Cambodia's imports were from ASEAN. In the same year, 52.5% of Myanmar's imports and 45.6% Brunei's imports were from ASEAN. Table 2.5 provides the figures for intra-ASEAN import for all ASEAN countries, except for Vietnam and Laos, for the period from 1995 to 2003.

In summary, within the disparity and diversity of ASEAN and APEC economies, there are some similarities worth noting. Today, all ASEAN, Japanese, Chinese and Koreans can communicate relatively well in English. They are trading partners and in total, are endowed with relatively large pool of labour as well as market demand. The founding ASEAN members, Japan, China and Korea generate a bulk of their aggregate output from the manufacturing and service sector and assume democratic ruling (with exception for China). The ability of ASEAN-5 + 3 to work together based on these common ground is apparent, in order to sustain the common goal of a successful regional economic co-operation, benefiting all participating economies.

Table 2.4 : Intra-ASEAN Export (1995 - 2003).

			Brunei	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Singapore	Thailand	Total
1995	Total	(in US\$ million)	2,771.0	N/A	45,418.0	67,147.8	N/A	17,394.2	104,618.7	59,347.0	296,696.7
	Intra-ASEAN	(in US\$ million)	529.7	N/A	6,475.9	18,435.6	N/A	2,357.5	31,770.7	10,609.6	70,178.9
	Intra-ASEAN	(%)	19.0	N/A	14.0	27.0	N/A	14.0	30.0	18.0	24.0
1996	Total	(in US\$ million)	2,493.3	N/A	53,844.5	74,246.7	N/A	19,533.0	117,349.4	55,894.7	323,361.5
	Intra-ASEAN	(in US\$ million)	446.4	N/A	8,310.1	22,694.0	N/A	2,970.3	34,441.4	12,111.5	80,973.7
	Intra-ASEAN	(%)	18.0	N/A	15.0	31.0	N/A	15.0	29.0	22.0	25.0
1997	Total	(in US\$ million)									
	Intra-ASEAN	(in US\$ million)	2,714.2	N/A	51,274.3	77,457.6	N/A	25,227.7	128,174.3	57,822.0	342,670.1
	Intra-ASEAN	(%)	496.4	N/A	8,851.0	23,248.7	N/A	3,436.2	35,793.9	13,525.7	85,351.8
	Intra-ASEAN	(%)	18.0	N/A	17.0	30.0	N/A	14.0	28.0	23.0	25.0
1998	Total	(in US\$ million)									
	Intra-ASEAN	(in US\$ million)	1,923.7	N/A	48,847.6	77,098.6	N/A	29,496.4	109,802.9	49,481.6	316,650.8
	Intra-ASEAN	(%)	220.8	N/A	9,346.7	21,611.4	N/A	3,821.0	25,998.2	8,314.7	69,312.9
	Intra-ASEAN	(%)	11.0	N/A	19.0	28.0	N/A	13.0	24.0	17.0	22.0
1999	Total	(in US\$ million)									
	Intra-ASEAN	(in US\$ million)	2,340.7	N/A	48,665.5	84,287.9	738.0	35,036.9	114,625.1	56,110.9	339,464.3
	Intra-ASEAN	(%)	375.1	N/A	8,278.3	21,885.0	236.8	4,989.1	29,269.3	9,901.9	339,464.3
	Intra-ASEAN	(%)	16.0	N/A	17.0	26.0	32.0	14.0	26.0	18.0	22.0
2000	Total	(in US\$ million)									
	Intra-ASEAN	(in US\$ million)	2,169.2	1,367.5	62,124.0	98,154.5	1,193.9	38,078.3	138,352.5	68,700.9	410,140.6
	Intra-ASEAN	(%)	639.5	76.0	10,883.7	24,408.6	393.5	5,982.6	37,784.0	12,708.2	92,876.0
	Intra-ASEAN	(%)	29.0	6.0	18.0	25.0	33.0	16.0	27.0	22.0	23.0
2001	Total	(in US\$ million)									
	Intra-ASEAN	(in US\$ million)	3,530.5	1,495.1	56,317.6	88,031.6	2,218.4	32,150.2	121,686.8	64,925.6	370,355.8
	Intra-ASEAN	(%)	774.8	72.6	9,507.1	21,024.2	951.3	4,986.0	32,815.4	12,194.6	82,325.9
	Intra-ASEAN	(%)	22.0	5.0	17.0	24.0	43.0	15.0	27.0	22.0	22.0
2002	Total	(in US\$ million)									
	Intra-ASEAN	(in US\$ million)	2,690.9	1,916.1	57,158.8	93,277.2	2,452.2	35,208.2	125,042.7	66,108.2	383,854.3
	Intra-ASEAN	(%)	684.2	91.9	9,933.5	22,127.1	1,221.3	5,529.7	33,962.6	12,840.4	86,390.7
	Intra-ASEAN	(%)	25.4	4.8	17.4	23.7	49.8	15.7	27.2	19.4	22.5
2003	Total	(in US\$ million)									
	Intra-ASEAN	(in US\$ million)	3,211.1	2,115.7	61,058.2	99,377.6	4,463.8	36,231.2	143,483.3	80,450.1	430,391.0
	Intra-ASEAN	(in US\$ million)	632.9	101.5	10,725.4	26,630.8	3,060.2	6,581.7	35,842.9	16,143.9	99,719.3
	Intra-ASEAN	(%)	19.7	4.8	17.6	26.8	68.6	18.2	25.0	20.1	23.2

Note : N/A means data not available.

Source : ASEAN Statistical Yearbook 2004.

Table 2.5 : Intra-ASEAN Import (1995 - 2003).

			Brunei	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Singapore	Thailand	Total
1995	Total	(in US\$ million)	2,132.7	N/A	40,654.1	71,439.9	N/A	21,640.0	110,115.0	72,572.8	318,554.8
	Intra-ASEAN	(in US\$ million)	1,013.0	N/A	4,219.0	12,522.6	N/A	2,489.1	24,537.6	8,820.8	53,602.1
	Intra-ASEAN	(%)	47.5	N/A	10.4	17.5	N/A	11.5	22.3	12.2	16.8
1996	Total	(in US\$ million)	4,434.8	N/A	46,618.5	75,303.1	N/A	28,392.6	123,411.0	72,445.6	350,606.2
	Intra-ASEAN	(in US\$ million)	2,848.6	N/A	5,549.0	14,682.3	N/A	4,011.8	27,362.2	9,757.2	64,211.2
	Intra-ASEAN	(%)	64.2	N/A	11.9	19.5	N/A	14.1	22.2	13.5	18.3
1997	Total	(in US\$ million)	2,310.7	N/A	41,679.8	76,988.3	N/A	35,932.5	135,972.0	63,087.8	355,971.8
	Intra-ASEAN	(in US\$ million)	976.8	N/A	5,413.1	14,840.1	N/A	4,872.8	30,396.9	8,121.7	64,621.2
	Intra-ASEAN	(%)	42.3	N/A	13.0	19.3	N/A	13.6	22.4	12.9	18.2
1998	Total	(in US\$ million)	1,276.3	N/A	27,336.9	60,976.5	N/A	29,659.9	101,495.0	38,711.6	259,456.9
	Intra-ASEAN	(in US\$ million)	591.1	N/A	4,559.2	12,940.0	N/A	4,428.9	23,647.6	5,438.1	51,604.9
	Intra-ASEAN	(%)	46.3	N/A	16.7	21.2	N/A	14.9	23.3	14.0	19.9
1999	Total	(in US\$ million)	1,720.4	N/A	24,003.3	63,677.8	1,883.0	30,742.5	110,998.0	48,318.0	281,342.9
	Intra-ASEAN	(in US\$ million)	895.6	N/A	4,783.6	12,412.8	1,038.6	4,461.0	26,241.0	7,987.4	57,820.0
	Intra-ASEAN	(%)	52.1	N/A	19.9	19.5	55.2	14.5	23.6	16.5	20.6
2000	Total	(in US\$ million)	1,067.6	1,404.6	33,514.8	79,647.5	2,219.4	31,387.4	134,680.0	61,935.3	345,856.6
	Intra-ASEAN	(in US\$ million)	534.4	549.1	6,781.2	15,934.9	1,113.3	4,955.4	33,291.3	10,049.4	73,209.0
	Intra-ASEAN	(%)	50.1	39.1	20.2	20.0	50.2	15.8	24.7	16.9	21.3
2001	Total	(in US\$ million)	1,310.0	1,502.0	30,962.1	73,097.9	2,811.0	29,550.8	115,919.0	61,975.4	317,128.2
	Intra-ASEAN	(in US\$ million)	544.8	1,091.7	5,726.8	15,254.3	1,319.2	4,664.8	28,991.0	9,241.4	66,834.0
	Intra-ASEAN	(%)	41.6	72.7	11.2	20.9	46.9	15.8	25.0	16.2	20.1
2002	Total	(in US\$ million)	1,600.4	1,664.8	31,288.9	78,797.8	2,118.1	33,576.4	116,336.4	62,729.9	328,112.7
	Intra-ASEAN	(in US\$ million)	627.5	598.0	6,995.5	17,245.2	1,190.8	5,542.0	30,441.4	9,683.1	72,323.5
	Intra-ASEAN	(%)	39.2	35.9	22.4	21.9	56.2	16.5	26.2	15.4	22.0
2003	Total	(in US\$ million)	1,351.9	2,906.4	32,550.7	80,091.1	1,843.3	37,496.5	127,320.7	75,759.4	359,320.0
	Intra-ASEAN	(in US\$ million)	616.9	1,694.9	8,030.3	14,329.5	967.8	6,398.1	31,085.7	11,699.4	74,822.6
	Intra-ASEAN	(%)	45.6	58.3	24.7	17.9	52.5	17.1	24.4	15.4	20.8

Note : N/A means data not available.
Source : ASEAN Statistical Yearbook 2004.

Nevertheless, based on recent studies, many researchers propose to strengthen economic co-operation, while others see the diversity and insincerity of ruling authorities as main obstructions for East Asia or even ASEAN to seriously work towards greater regional co-operation. These inconclusive findings within ASEAN, East Asia and Asia-Pacific regions are summarised in Table 2.6 and Table 2.7.

Table 2.6 : Summary on Studies on ASEAN Co-operation

Author(s)	Purpose of study	Finding	Regional co-operation?
Bayoumi and Maoro (1999)		<ol style="list-style-type: none"> 1. ASEAN countries' exposure to fluctuations among major currencies is relatively high and none of the major currencies was an obvious candidate for a common peg. 2. ASEAN trades about one half with EMU. But, within the same time frame, EMU was more ready to peg its currency to another, namely the US dollar, than ASEAN. 	No
Sharma and Chua (2000)	Economic co-operation in ASEAN-5 and its ability to promote intra-member trade in the Asia Pacific.	<ol style="list-style-type: none"> 1. Trade in ASEAN increased with the size of the economy. 2. ASEAN co-operation scheme did not increase intra – ASEAN trade. As such, the recent development of the ASEAN free trade area has very little economic impact. 3. There is prospect of a closer economic co-operation in ASEAN through development of smaller sub-regional economic co-operation. For instance, the Singapore-Johore-Riau growth triangle could bind individual ASEAN countries. 	No
Ng (2002)	Studied the external shocks, domestic supply shocks and domestic demand shocks experienced by ASEAN, EMU and NAFTA.	<ol style="list-style-type: none"> 1. External shocks were more highly correlated in ASEAN than those of EMU and NAFTA. 2. The domestic demand and supply shocks of ASEAN were more correlated than those of EMU but lesser than those of NAFTA 3. The magnitude of shocks on ASEAN was compatible to those of EMU but lesser than those of NAFTA. 4. ASEAN experienced increasing intra-regional trade in the 1990s and the formation of AFTA was likely to further stimulate intra-regional trade. 5. Although there seems to be diversity in terms of monetary policy implementation among ASEAN countries, the gap is narrowing in recent years. 	Yes
Elliott and Ikemoto (2004)	The effect of AFTA on world and regional trade patterns.	<ol style="list-style-type: none"> 1. Trade flows were not significantly affected immediately following the signing of the AFTA in 1993. 2. Though limited, there was some positive AFTA effect on intra-ASEAN trade. 3. The emergence of credible competition from China, South America and Eastern Europe, as well as the EMU, NAFTA and other economic groupings in the Middle East may have caused a diversion of trade effect. 4. The 1997 financial crisis has generated stronger desire to source imports from within the ASEAN region. 	No
McAleer and Nam (2005)	Suitability of establishing a common currency area for ASEAN-5 from the perspective of contagion.	<ol style="list-style-type: none"> 1. Contagion was present between all country pairs in ASEAN-5, an indication that the degree of correlation among the ASEAN-5 economies had increased during the Asian financial crisis. 2. Closer monetary co-operation among ASEAN-5 economies would be feasible 	Yes

Ramayandi (2005)	Discuss on issues and prospects of ASEAN monetary union.	<ol style="list-style-type: none"> 1. ASEAN-5 is found to be suitable for a monetary co-operation due to their relative symmetrical economic shocks and trade patterns. 2. Similarities in their recent demand shock components and exchange rate variations also suggested their harmonisation in macroeconomic policies previously thought otherwise. 3. Still, monetary integration in ASEAN would require a relatively long process. The process of integrating the monetary systems, the underlying incentive structure behind the process of integration and proper institutional set-up may post substantial challenge to a smooth monetary union. 	Yes
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Table 2.7 : Summary on Studies on East Asia Co-operation

Author(s)	Purpose of study	Findings	Regional co-operation?
Choe (2001)	The effect of bilateral trade dependence on the co-movement of business cycles.	<ol style="list-style-type: none"> 1. Economic fluctuations tend to be more synchronised within the region as trade interdependence deepens. 2. Co-operation is necessary to prevent unfavourable future economic crisis within the East Asian region 	Yes
Ling (2001)	The suitability of the East Asian economies for a regional monetary arrangement.	<ol style="list-style-type: none"> 1. Due to the diverse economic circumstances of the sampling economies, regional monetary co-operation could be a start to establish a smaller currency area. 2. A multi-speed monetary co-operation strategy where smaller sub-groupings could first focus on internal harmonisation. External harmonisation would be an intermediate and long term goal. 3. Forming a single currency area once sufficient degree of harmonisation and convergence is achieved. 4. In the mean time, East Asia to focus on greater trade and investment liberalisation. 	Yes
Kim (2002)	Trade intensity in ASEAN + 3 economies.	<ol style="list-style-type: none"> 1. Only ASEAN's close trade relations with Japan could be explained by model. 2. However, growing trade intensity may arise from a higher degree of economic correlation between trading partners. Over time, bilateral trade has also intensified through the increased in economic size or income effect. 3. Special trade relationship among ASEAN + 3 contributes to the growth of trade intensity within the region. 	Yes
Crosby (2003)	The correlations of Asia-Pacific economies.	<ol style="list-style-type: none"> 1. Trade did not appear to be very strongly associated with higher correlations between GDP. 2. Structural similarity between countries was positively associated with business cycle correlation. 	No
Chow and Kim (2003)	The symmetricity of shocks in East Asia	<ol style="list-style-type: none"> 1. East Asia is structurally different and is more likely to face asymmetric shocks. 2. Economic integration in East Asia would be more costly and more difficult to sustain. 	No

Kwak's (2004)	Feasibility, co-ordination and leadership role in East Asia.	<ol style="list-style-type: none"> 1. East Asia is vulnerable to disturbances from abroad and they faced a high degree of capital mobility across countries. 2. Each East Asian economies encounters symmetric disturbances but lack of political commitment . 3. The majority of East Asian economies have a weak banking system with huge external debt denominated in various foreign currencies. 4. The main players in East Asian economy, China and Japan, to lead in promoting regional monetary and policy co-operation. 	No
Lee, <i>et al.</i> (2004)	The effects of multilateral and regional trade policy scenarios within China, Japan and the US.	<ol style="list-style-type: none"> 1. China, Japan and the US should focused on trilateral free trade arrangement and do away with FTAs in East Asia. 2. China, Japan and the US would realise large fractions of the residual gains from global trade liberalisation. 	No
Peridy (2005)	Trade effects of the EU-Mediterranean agreements and its implications for ASEAN's new regional policy.	<ol style="list-style-type: none"> 1. EU-Mediterranean's agreements have significantly increased Mediterranean countries' exports to the EU. 2. ASEAN's regional initiatives with Japan, the US, Australia and New Zealand offer significant trade prospects. 	Yes
Lim (2005)	The prospect of a dollar or yen currency unions in the East Asian region.	<ol style="list-style-type: none"> 1. Co-movements of price support a common dollar and yen areas for all countries, except Indonesia. 2. Currency convergence for Hong Kong, Indonesia, Malaysia, the Philippines and Thailand to the East Asia's average converging trend. 3. Currency of each country seems to move in a rather constant rate to the Japanese yen. 4. Although none of the East Asian economies currencies had a long-run cointegrating relationship with the Japanese yen, there was a common long-run trend for Hong Kong, South Korea, Philippines, Singapore and Thailand's exchanges, an indication of possible currency union. 	Yes
			Yes
Angresano (2004)	EU integration lessons for ASEAN + 3.	<ol style="list-style-type: none"> 1. ASEAN + 3 could learn from the EU that integration can serve as a means of self-defence against growing trend towards regional trade agreements with strong countervailing bargaining power in international trade negotiations. 2. The final outcome of integration among ASEAN + 3 will be determined by the political will and economic objectives of concerned political authorities. 3. However, ASEAN + 3 are not ready for to adopt a common currency yet. 	
Nasution's (2005)	Chronicles of monetary co-operation in East Asia	<ol style="list-style-type: none"> 1. Upon the 1997 Asian financial crisis, Japan was dissatisfied with IMF and proposed to establish the Asian Monetary Fund (AMF). The AMF did not materialised as it was opposed by the US, Europe and China. 2. The current notable economic co-operation involve the founding ASEAN economies of Indonesia, Malaysia, Philippines, Singapore and Thailand, with Japan, China and Korea. Taiwan is excluded. 	Yes

Kuik (2005)	Origin and patterns of China's involvement in ASEAN regional multilateralism.	<ol style="list-style-type: none"> 1. China remains open towards multilateralism. 2. China perceive multilateral institutions as useful vehicles for advancing its own policy objectives of strengthening ties with neighbouring countries. 3. China's change towards multilateralism is gradual but slow. 	Yes
Inama (2005).	Briefly examined the effectiveness of tariff liberalisation and origin issues of the ASEAN-China FTA.	<ol style="list-style-type: none"> 1. Trade liberalisation in the ASEAN-China FTA seems to fall short of its modest aim 2. There was little linkage and sequential efforts to liberalise and stimulate intra-regional trade initiatives among ASEAN FTA and ASEAN-China FTA. 3. FTAs and other regional integration initiatives in Southeast Asia could be developed from the common WTO framework. 	No
Heller (2005)	The relevance of the ASEAN Regional Forum for regional security in the Asia-Pacific region.	<ol style="list-style-type: none"> 1. The ASEAN Regional Forum provided ASEAN an important communication channel to improve mutual understanding and influence towards constructive co-operation of territorial integrity, national sovereignty and economic well being. 2. The forum also creates positive experiences among members that will encourage members to proceed further to another stage of co-operation. 	Yes
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Karras (2005)	To examine the macroeconomic costs and benefits of adopting Yen as a common currency among 18 Asian and Asian Pacific countries.	<ol style="list-style-type: none"> 1. Benefit of adopting Yen is enhanced price stability, exchange rate stability, and a lower steady inflation rate. The cost would be to give up independent monetary policy and a possibility of higher business cycle volatility if the adopting country's output is not sufficiently synchronised with that of Japan. 2. The estimated cost and benefits of adopting Yen varied substantially and are often positively correlated. <ul style="list-style-type: none"> • Bangladesh and Nepal have a lot to gain and lose • Singapore, Thailand and Taiwan, have little to lose or gain • Korea has a positive net benefit, an indication of a more favourable candidate for adopting Yen, as compared to Pakistan and Malaysia. 	Yes
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2.3 Evaluating candidates for regional co-operation

Economic co-operation is the lesser degree of an economic integration. Nonetheless, economies forging economic ties and regional co-operation, like East Asia, are en route for the formation of an economic union.

Many studies had addressed the issue of economic integration with regards to the optimum currency area (OCA) criteria (see Bayoumi and Eichengreen, 1994; Dueker and Wesche, 2001; Hallett and Piscitelli, 2002; Mongelli, 2002). Early views of the OCA theory stressed on the importance of labour mobility (Mundell, 1961), openness of an economy (McKinnon, 1963) and product differentiation (Kenen, 1969) as criteria necessary to form an OCA. Based on these fundamental criteria, recent researchers examined other factors that may be essential to form an OCA. These criteria include having stable or fixed exchange rate, facing symmetrical shocks, increasing trade and capital flows, as well as experiencing coherent macroeconomic activities through fiscal and monetary co-ordination.

The theory of OCA also forms a framework to assess the costs and benefits of monetary integration. Information about the benefit of a monetary union is ascertained from the importance and composition of intra-regional trade. Lower transaction costs and maintaining a stable bilateral exchange rate between potential member nations may encourage greater intra-regional trade (Bayoumi *et al.*, 2000).

Moreover, the similarity of past macroeconomic policies, stage of economic development and financial systems would increase the suitability of countries to be integrated.

Bayoumi *et al.* (2000) reasoned that a more flexible and sustainable fiscal policy would reduce the need to rely on monetary policy to respond to shocks. Countries with similar level of economic development like a significant degree of convergence in output, intra-regional trade, and investment, would ease the process of adopting a common currency. It also follows that a country with high inflation and macroeconomic instability may find it difficult to be accepted by other potential countries to form a currency union. Likewise, financial systems that work in a similar manner, where changes in the stance of monetary policy that do not differ significantly (in term of amplitude and timing on output across countries), indicating a suitable candidate of OCA.

As for the EMU, it evaluates the compatibility of economies through institutional convergence criteria. The EMU established a set of "convergence criteria" to be fulfilled by countries desired to adopt the common currency euro. Countries that fulfil the convergence criteria that are specifically spelt out in the Maastricht Treaty, will be eligible to join the euro area.

In brief, there is no single "best" approach to evaluate to eligibility of economies to form some sort of regional co-operation. The EMU's convergence criteria were amended and revised before and after implementation. Even so, it was still criticised by Britain, who decided not to adopt the euro. Nevertheless, meeting some of these criteria would indicate the compatibilities of economies concerned to establish an initial platform for closer regional economic co-operation.

3.0 Economic and Monetary Integration: ASEAN+3 Evaluated

Economic integration is an effort of constituting policies to reduce or eliminate trade barriers among nations joining together to form a union (Salvatore, 2004). Economic integration occurs when several countries are united to discriminate between economic units belonging to different member economies and promoting various economic and political activities to benefit citizens of member countries (Balassa, 1961). The degree of economic integration, however, ranges from establishing free trade areas, customs unions, common markets, economic and political unification among member economies.

The loosest degree of economic integration is in the form of reduced trade barriers established among two or more economies to form a free trade area. Examples of such trade arrangements include the European Free Trade Association (EFTA) formed in 1960 by the UK, Austria, Denmark, Norway, Portugal, Sweden and Switzerland; the North America Free Trade Agreement (NAFTA) formed in 1993 by the US, Canada and Mexico; the ASEAN Free Trade Area, commonly known as AFTA formed in 1992; as well as the SAARC Preferential Trading Arrangement, formalised as the South Asian Free Trade Area (SAFTA) in 1998. From a free trade area, a custom union is formed when member economies begin to harmonise trade policies toward the rest of the world to create a duty-free economic zone. An example of a custom union is the European Common Market (ECM) formed by West Germany, France, Italy, Belgium, the Netherlands and Luxembourg in 1957. A matured custom union provides the foundation for the formation of a common market where a high degree of free trade movement of labour and capital among member nations occurs. The ECM achieved the status of a common market in 1993.

Briefly, economic integration also relates to the integration of commodity market, financial market (Coleman, 1999; O'Neill, 2002) and labour market (O'Neill, 2002). In a more advance stage of economic integration of an economic union, monetary and fiscal policies of member economies are harmonised and unified (Salvatore, 2004).

The recent interest, however, is to establish regional co-operation among a smaller group of a larger economic grouping or trading block. A sub-regional co-operation seems to be the present trend to achieve the desired long run goal of an integrated economy within the larger group of economies. Regional co-operation of ASEAN, Japan, China and Korea, for example; is encouraged to help boost the pace of economic union of the larger establishment, APEC.

Therefore, a brief account on research related to optimum currency areas, economic integration and regional co-operation of past literatures are essential reviews.

3.1 Optimum Currency Areas (OCA) and Related Studies.

The theory of Optimum Currency Area is concerned with optimising a region's economy with countries within the region, giving up their own independent currency in order to form monetary integration and to share a common currency. In international trade, the use of different currencies with different values results in imbalances in a country's balance of payment. As such, currency can be a policy tool to offset imbalances in the balance of payment when it is

allowed to appreciate and depreciate in value relative to other currencies. However, smaller economies sometimes find it difficult to allow its currency to float freely in the money market. Currency depreciation may increase the country's export and improves its balance of trade but, small economies may not be able to sustain the pressure of deteriorating value of its currency before it is stabilised again. Depreciation of domestic currency will reduce the purchasing power of locals while enhancing that of foreigners. As such, many smaller economies may opt to maintain a fixed exchange rate where their currency is pegged to another, usually the USD. If that is the case, should all small nations adopt a fixed exchange rate to stabilise the value of their currency? Mundell (1961), among others, said yes.

Mundell (1961) established that monetary union should be formed within a fixed exchange rate regime where nations within a region share a common, fixed, currency. The formation of monetary union also means that a larger currency area will have a larger exchange market for the common currency. This is an advantage because currency speculation and volatility will be reduced. Reserves for participating nations in the monetary integration could also be pooled together to maintain a fixed and stable exchange rates. Region should have sufficient inter-regional labour mobility to take over the role of flexible exchange rate to correct any imbalances in the balance of trade. Mundell argued that labour mobility between countries that are participating in a monetary union would be able to mitigate any negative asymmetric shocks, previously absorbed by the flexible exchange rate.

In response to Mundell's (1961) inferences, McKinnon (1963) argued that labour mobility is a necessary but insufficient condition for an OCA. McKinnon stressed on the openness of an economy (or trade). The openness of an economy can be measured by the ratio of tradable goods to non-tradable goods. According to McKinnon (1963), the more open the prospective member nations are to each other, the more the incentive they have to form an OCA. McKinnon reasoned that a larger country would be more diversified in its production and therefore, is less dependant on imports and exports. Meaning, the larger the economy, the less open it would be. As a result, a larger economy would be self-sufficient and have less incentive to peg its currency to another or enter into a monetary union. Only a small country's economy will be more open, and therefore, be willing to peg its currency to another and enter into a monetary union (Bayoumi and Eichengreen, 1997).

Both Mundell and McKinnon agreed on the notion that smaller economy will have more incentive to enter into a fixed exchange rate regime and thus, enter into a monetary union. However, Kenen (1969) proposed that product diversification as a necessary criterion instead. An economy with a high degree of diversification will be less affected by any adverse economic shock than an economy with a low degree of diversification. Kenen (1969) reasoned that as the degree of diversification increases, any negative economic shocks will affect products that make up of a smaller share of total exports. The more diversified the economy is, the less pronounced the effects of a shock and the less the economy is dependent on the exchange rate policy tool for stabilisation. Therefore, it would be appropriate for a well diversified economy to adopt the fixed exchange rate and form a monetary union (Bayoumi and Eichengreen, 1997).

In summary, Mundell (1961), McKinnon(1963) and Kenen (1969) all agreed that countries that were less dependent on exchange rate as a policy tool would be a more favourable OCA.

Mundell proposed factor (labour) mobility to take over the role of exchange rate to stabilise the economy. On the other hand, McKinnon suggested that smaller economies that are more open to trade should form a monetary union because they are more vulnerable to economic shocks transmitted through trade. Kenen (1969) further supports McKinnon's view by saying that less diversified economies will be more likely to be affected by economic shocks because each product produced constitutes a larger percentage of the total trade.

These early views on OCA provide a theoretical foundation to examine the possibility of monetary integration among economies. However, it is not an easy task to formulate Mundell's labour mobility criterion, let alone to model and measure the degree of economic integration. Most researchers agreed that the degree of integration and openness of the economy are two basic criteria of an OCA. A high degree of integration and openness will encourage extensive trade among economies. A high volume of intra-regional trade will act as a shock transmitter and necessitate economic co-operation (Trivisvavet, 2001).

In the span of the last two decades, OCA properties were reviewed but there was still no "one" simple clear cut "best" OCA-test to check if the OCA criteria were met. Most studies examined the existing criteria while others proposed additional criteria complementing the existing OCA properties. Researchers examined the impact of removing geographical borders to create a free trade zone, a custom union, a common market, as well as sharing of a single currency on trade and overall economic integration (Mongelli, 2002). They include trade intensity, measured through export and trade; fiscal policy (proxied by government debt and budget deficit) and monetary policy (proxied by M1, M2, interest rates and monetary bases) co-ordination.

Kenen (1969) argued that the increase in trade linkages would increase production specialisation and reduced synchronisation of business cycles, especially when industrial-specific technology shocks occurred (Kenen, 1969). Frankel and Rose (1998) further explained that when intra-industry trade was more prominent than inter-industry trade, business cycles would be more positively correlated as trade becomes more integrated. Nevertheless, Choe (2001) contested that economic fluctuation would likely increase as economies are trade interdependent. As such, Shin and Wang (2003) attempted to clarify these contradicting results by studying the trade integration and business cycle synchronisation in five East Asia countries (China, Hong Kong, Japan, Korea, Taiwan), five Southeast Asia countries (Indonesia, Malaysia, Singapore, Philippines, Thailand) and two South Asian countries (Bangladesh, India). Annual data were obtained for the sampling period between 1976 and 1997 from the International Monetary Fund, International Financial Statistics CD-ROM.

Shin & Wang (2003) studied the real GDP, a proxy of macroeconomic aggregate output; ratio of total trade to GDP, a proxy for trade intensity; ratio of budget deficit to GDP between country *i* and country *j*, a proxy for fiscal policy co-ordination; and M2 growth rate, a proxy for monetary policy co-ordination. Empirical finding suggested that increased trade increased the degree of economic integration within region. Business cycle was continuously affected by other economies in Asia and intra-industry trade was the major channel for East Asia economy to synchronise. Therefore, the cost of joining a currency union is reduced when intra-industry trade dominates.

In addition, the openness of an economy can be read in terms of the intensity of trade an economy is involved in. Smaller economies are less diversified and thus more open or dependent on export and import (trade). This means, smaller economies are more vulnerable to exchange rate fluctuations and will be more willing to maintain or peg its currency to a fixed rate. Their suitability to join an economic union can be determined by analysing the variability of the real exchange rate. Bayoumi and Eichengreen (1997) examined the variability of real and nominal exchange rates and constructed an OCA index based on empirical specification that summarises countries' readiness for European Monetary Union. They measured the importance of trade linkages using data on bilateral trade, computing the average value of exports to the partner country, scaled by GDP for the two countries concerned. The costs of a common currency in terms of macroeconomic policy independence foregone should be balanced against the benefits. Small countries should benefit the most from the unit of account, means of payment, and store of value services provided by a common currency. The benefit from a more stable currency was measured by including the arithmetic average log of real GDP in USD of two countries, as a measure of country size.

The empirical results showed that European countries were divided into three groups, those exhibiting a high level of readiness, those with a tendency to converge and those with little or no evidence of convergence. They also found that France's OCA index did not indicate that the country's structural characteristics and cyclical performance were consistent with a high level of bilateral exchange rate stability. This finding indicated that the desire for monetary unification in France is driven by political rather than economic considerations.

Moreover, Bayoumi and Eichengreen (1997) discovered that countries with single market had led to greatest increased in bilateral trade, experienced the greatest increase (OCA index) in their readiness for an OCA. Economic integration increased countries' readiness for monetary integration and as stable exchange rate encouraged trade, monetary integration led to advancement of economic integration. Intrinsically, European Monetary Union and the Single Market system constitute a revolving cycle.

By using the nominal bilateral exchange rates of 21 industrial countries, Bayoumi and Eichengreen (1998) also found that countries with more variable exchange rates are subjected to larger asymmetric shocks. The asymmetric shocks increase exchange rate variability by magnifying exchange rate market pressure. Those with unstable rates suffer greatest reduction in transaction value of their domestic currency when their exchange rates vary because they are small in size and are dependent on trade. Therefore, smaller size and trade dependent economies are found to encounter less exchange rate variability, prompting support to the OCA theory.

In another study, Hallett and Piscitelli (2002) examined the conditions when endogenous convergence would and would not occur by using a simple general equilibrium explanation of the economy. They examined the impact of market integration of convergence between business cycles. The endogenous OCA hypothesis stated that an increasing degree of trade integration between two countries would increase the degree of convergence between their business cycles. Therefore, if the correlation itself fell as trade integration proceeds, then increasing trade would not lead to convergence in economic performance. Hallett and Piscitelli (2002) found that large, stable economies with integrated structures were likely to diverge, but smaller, more volatile or

less well integrated economies will converge. The symmetry of shocks was not an important cause of convergence.

Moreover, by using the Johansen and Juselius (1990) multivariate cointegration approach, Bredin and Fountas (1998) tested on the number of common stochastic trends of seven EMU, namely Belgium, Denmark, France, Germany, Ireland, Italy and the Netherlands. By dividing the monthly data from March 1979 and August 1992 into two, one from March 1979 to January 1987 and another from February 1987 to August 1992, Bredin and Fountas tested for the increase in convergence of EMU monetary policy. The proxies used for monetary policy were short term (overnight) interest rates and monetary base. The monthly data were obtained from the International Financial Statistics data published by IMF.

Short term interest rates was used because it reflects short run actions through the resulting change in the domestic money market interest rates. As for monetary base, it reflected the actions being taken by the Central Bank to affect reserves in the banking system. Using VAR, empirical results indicated that there was little progress made on the issue of convergence of monetary policy within the EMU. Although there was a slight improvement in the second period for interest rates, there is still no full monetary policy convergence. Germany, Netherlands and France were found to play an important role in the EMU where these countries achieved full convergence in the second period of study (Bredin and Fountas, 1998).

The study on the level of economic integration or disintegration within and between economies could explain the economic interdependence or linkages of macroeconomic aggregate such as trade, capital, labour and technology between states, countries, grouping of countries or regions (O'Neill, 2002). Sayek and Selover (2002) used the IS-LM structural VAR estimation to determine the linkages and co-movements of output, prices, interest rates and money supply between Turkey and Europe. Data for Germany is used as a proxy for EMU and all data are obtained from the International Monetary Fund's (IMF) International Financial Statistics (IFS). Sayek and Selover (2002) discovered that the Turkish business cycles did not synchronise with that of EMU. The Turkish business cycles were non-coincident with business cycles of Europe, although they may sometimes appeared to lead European cycles. European and Turkish real GDPs were not cointegrated. Moreover, European and Turkish real GDP growth rates were uncorrelated or negatively correlated. Granger causality test and regression analysis revealed no Granger causality between Turkish and European business cycles or between Turkish and Germany blocks. The SVAR analysis revealed slight income transmission from Germany to Turkey, but not enough to bring about business cycles synchronisation. In addition, the composition of Turkey's export was in relatively income inelastic goods, further weakening the transmission effect.

The divergence of business cycles between Turkey and Europe was due to domestic and regional shocks specific, for instance, domestic political conflicts, economic and financial crisis, domestic economic political mistakes and war such as the Iran-Iraq and the Gulf war. These shocks were specific to Turkey and unfelt in Europe. The divergence between Turkish and the EMU business cycles increased the possible cost to Turkey of a potential future entry into the EMU and reduced possibility that Turkish entry into EMU. At present, the lack of business cycle synchronisation

meant that Europe investors might benefit by diversifying their assets through investment in Turkey (Sayek and Selover, 2002).

In addition, Dueker and Wesche (2001) examined the co-movement of output, income, employment and sales of Germany, France and Italy, as well as the UK and US to analyse whether intra-EMU business cycles appeared more closely correlated with each other than with significant outside countries such as the UK and the US. They constructed a business cycle index of industrial production, real personal income, real retail sales and employment to measure the cycle to cycle comparison within a country, cross-country correlation and simple aggregation. The evolution of correlation was found to be consistent with the claim that the European economies were becoming more harmonised over time, but there was no guarantee that this pattern will hold in the future. If looser policy co-ordination was able to dampen economic shocks better, then Dueker and Wesche suggested that the common monetary policy, in combination with the policy constraints from the Growth and Stability pact, could lead to more divergence among national business cycles in Europe in the future.

3.2 Economic Co-operation

In Asia, there are several groups of economies that are actively working towards regional economic co-operation. In fact, the development of economic co-operation in Asia has progressed to a level where many existing group or economic block has extended beyond their geographical boundaries and began looking for possibilities for a wider co-operation. One example is the East Asia regional co-operation which has recently met and discussed on possible economic co-operation with other non-Asian economies like Australia, New Zealand and Russia.

Moreover, other Asian economic blocks like the SAARC, ECO and GCC, continued to look for avenues to strengthens co-operation within their regions.

3.2.1 ASEAN co-operation arrangements

Ng (2002) stressed that countries with highly correlated shocks would encourage greater integration because the entire integrated economy would be able to respond to that shock through one common monetary policy. Ng examined the correlation of economic shocks among 5 ASEAN economies using annual real and nominal GDP data for the sampling period between 1970 – 1995 obtained from the International Monetary Fund's International Financial Statistics, the World Development Indicators published by the World Bank and other domestic sources.

Ng (2002) studied the external shocks, domestic supply shocks and domestic demand shocks experienced by ASEAN, EMU and NAFTA. Ng discovered that external shocks were more highly correlated in ASEAN than those of EMU and NAFTA. The domestic demand and supply shocks of ASEAN were more correlated than those of EMU but lesser than those of NAFTA. Ng also found that the magnitude of shocks on ASEAN was compatible to those of EMU but lesser than those of NAFTA.

Ng's findings revealed that ASEAN experienced increasing intra-regional trade in the 1990s and the formation of AFTA was likely to further stimulate intra-regional trade. Although there

seems to be diversity in terms of monetary policy implementation among ASEAN countries, the gap is narrowing in recent years.

The effect of macroeconomic variables on the output of the country has been studied by Masih and Masih (1996). They investigated the causal relationships between real output, aggregate money M1 (currency plus demand deposits) and M2 (M1 plus money market deposits, savings deposits and small fixed or time deposits), interest rate, inflation rate and exchange rate in Thailand and Malaysia. They found that M1 played the leading role of policy variable in Malaysia and Thailand. As for output, interest rate, exchange rate and prices, they generate short run endogeneous adjustment in different proportions to re-establish long run equilibrium. That is to say money supply, M1, was predominantly leading output and the other three endogeneous variables.

Based on findings from Bayoumi and Maoro (1999), the composition of ASEAN's trade by type of product was relatively favourable to consider for the formation of a currency union. Its exports of manufactured goods had increased for the past two decades, which amounted to four-fifths of total exports, slightly lower to the corresponding import ratio. ASEAN's trade was highly diversified and the major currency areas like the US, the EMU and Japan, were important trading partners for most ASEAN. This was an implication that ASEAN countries' exposure to fluctuations among major currencies were relatively high and none of the major currencies was an obvious candidate for a common peg. Unlike the eastern and central European countries, ASEAN trades about one half with EMU. But, within the same time frame, EMU was more ready to peg its currency to another, namely the US dollar, than ASEAN.

In addition, Sharma and Chua (2000) used the gravity model to study the economic co-operation of ASEAN-5 and its ability to promote intra-member trade in the Asia Pacific. Based on annual data published by the International Monetary Fund, International Financial Statistics CD-ROM, they examined GDP, GDP per capital (as proxy for level of development and infrastructure to facilitate trade), export and import as well as the distance between two countries' ports measured in nautical miles (proxy for transportation costs).

Their empirical findings suggested that trade in ASEAN increased with the size of the economy. However, ASEAN integration scheme did not increase intra-ASEAN trade. As such, the recent development of the ASEAN free trade area was said to have very little economic impact since less than one-fifth of their total trade was intra-ASEAN. However, the prospect of a closer economic co-operation in ASEAN remains bright and the successful development of smaller sub-regional economic co-operation, for instance the Singapore-Johore-Riau growth triangle could bind individual ASEAN countries.

Similarly Elliott and Ikemoto (2004) used a gravity equation, modified, to investigate the effect of AFTA on world and regional trade patterns. They examined GDP, GDP per capital, export, import, population as well as the distance between two countries of 35 APEC, ASEAN, European Union, NAFTA and several independent economies, selected based on the availability of data, from 1982 – 1999. ASEAN was the focus of Elliott and Ikemoto's study, while the other non-ASEAN member economies were used as a comparison in analysis.

With a focus on ASEAN, Elliott and Ikemoto (2004) supported Sharma and Chua's (2000) findings that trade flows were not significantly affected in the years immediately following the signing of the AFTA agreement in 1993. Ironically, the degree of trade creation was discovered to be lower the preceding period of 1988 – 1992. In spite of this, there was some positive AFTA effect on intra-ASEAN trade. Elliott and Ikemoto (2004) explained that the emergence of credible competition from China, South America and Eastern Europe, as well as other regional trade agreements such as the EMU, NAFTA and other economic groupings in the Middle East may have caused a diversion of the trade effect. The 1997 financial crisis, however, has generated stronger desire to source imports from within the ASEAN region.

In addition, McAleer and Nam (2005) examined the suitability of establishing a common currency area for ASEAN-5 from the perspective of contagion. They argued that the presence of contagion meant that there was an increase in the correlation of shocks experienced within a region. Based on the OCA literature, they reasoned that the symmetry of underlying economic disturbances across countries in a region would be less costly to establish a common currency area. To put their theory to test, they extracted daily foreign exchange rates data, denominated in USD, for six countries, namely Indonesia, Japan, Malaysia, the Philippines, Singapore and Thailand from 3rd January 1994 to 18th September 2002. Their rationale for using daily observations to test for contagion was to capture the volatility in exchange rates attributable to investor response to news. According to McAleer and Nam (2005), daily exchange rates were known news driven.

McAleer and Nam (2005) used the GARCH model to ascertain the presence of contagion between pairs of ASEAN-5 countries and its effect on foreign exchange rates in ASEAN-5. They discovered that contagion was present between all countries in ASEAN-5, an indication that the degree of correlation among the ASEAN-5 economies had increased during the Asian financial crisis. Therefore, they affirmed that closer monetary co-operation among ASEAN-5 economies would be feasible.

Ramayandi (2005) reviewed past literatures on possible ASEAN monetary union and examined bi-variate aggregate structural VAR shock relationships of ASEAN-5 from 1960 till 2002. ASEAN-5 is found to be suitable for a monetary co-operation due to their relative symmetrical economic shocks and trade patterns. In addition, similarities in their recent demand shock components and exchange rate variations also suggested their harmonisation in macroeconomic policies previously thought otherwise. Nonetheless, monetary integration in ASEAN, although not impossible, will have to go through a relatively long process. The process of integrating the monetary systems, the underlying incentive structure behind the process of integration and proper institutional set-up may pose substantial challenge to a smooth monetary union (Ramayandi, 2005).

3.2.2 East Asia and Asia-Pacific co-operation

At this moment in time, East Asian economies are seen to be actively engaged in regional co-operation. Consequently, many studies had begun to examine the possibility of regional co-operation within the Asia Pacific region, as well its impact of such co-operation. Choe (2001), for one, examined the effect of bilateral trade dependence on the co-movement of business cycles for 10 East Asian countries. Specifically, Choe examined if the synchronisation of business cycles among East Asian economies was affected by the evolution of economic co-operation through trade. The relationship between the co-movement of cyclical components of income and bilateral trade dependence was tested based on 45 pairs of cross-sectional data for 10 East Asian countries over the periods 1981 – 1995 by OLS estimation. The empirical findings suggested that economic fluctuations tend to be more synchronised within the region as trade interdependence among them deepens. The empirical findings suggest that co-operative efforts are necessary to prevent or adjust unfavourable future economic crisis in East Asia.

Many have questioned the rationale of *ASEAN-China* FTA (Holst and Weiss, 2004; Tongzon, 2005). Approximately 84 percent of China's top exports are also ASEAN's major exports (Tongzon, 2005). With such similar export structure, more intense competition is expected between ASEAN and China. By admitting China into the picture, ASEAN can therefore expect stiffer direct and indirect export competition from China (Holst and Weiss, 2004).

Being the most populated single country in the world, it is a known fact that China's main source of international competitiveness comes from its low wages and huge market potential. Although the present labour productivity differences between ASEAN and China are not substantial, ASEAN should not be too complacent of its current productivity performance. According to Tongzon (2005), China's output per worker has grown at a rate higher than those achieved by the Philippines, Indonesia and Malaysia. If ASEAN does not improve its productivity and value-add its manufactured products, China's increasing output per worker may quickly outdo those of ASEAN's.

Certainly, ASEAN would not continue to negotiation and work towards the establishment of an ASEAN-China FTA if it will only benefit China. Firstly, there are economic opportunities resulting from a more liberalised Chinese market within the FTA. China imports a significant amount of raw materials and industrial components used as inputs. Furthermore, China's appetite for imported food and agricultural products is increasing as its standards of living and population grow. Since China has a competitive disadvantage in most of its imports, ASEAN has great opportunities to tap into China's potential market (Tongzon, 2005).

As for newer ASEAN member economies, namely Cambodia, Laos, Myanmar and Vietnam, the ASEAN-China FTAs will provide greater market access in resource, agro-based and some manufactured products (Wattanapruttipaisan, 2003). Although these newer ASEAN economies would also face greater competition from China in both domestic and third country markets, special and differential treatment and flexibility would ensure effective participation of all ASEAN economies in the ASEAN-China FTAs co-operation (Wattanapruttipaisan, 2003).

Besides, Cheng (2004) felt that ASEAN-China FTAs would improve China-ASEAN relations, enhance mutual interests and interdependence and erode ASEAN's perception of China as a threat to the region. ASEAN-China FTA would therefore, facilitate the narrowing of the gap between the more developed and developing ASEAN members, as well as that between the more prosperous coastal provinces and the poor interior provinces in China (Cheng, 2004).

While ASEAN-China co-operation is of concern, the integration among the regions within China itself should not be left unchecked. Being one of the fastest growing economies in the world for the past two decades, Bystrom, Olofsdotter and Soderstrom, (2005) analysed regional differences across Chinese regions by employing the OCA framework. They found that China and its regions, such as Hong Kong and Macao, are currently moving closer to an OCA than in the 1990s. Bystrom, *et al* (2005) discovered that the trend of a stronger OCA in China increased over time when participating regions adopting the same Yuan currency became more integrated. However, Bystrom cautioned that their suggestion to admit Hong Kong and Macao into the current Yuan Area are based on their empirical findings and macroeconomic analysis. The feasibility of such practice would therefore be subject to political commitment, geographical and other economic conditions.

But again, would APEC, ASEAN + 3 or any other combination of *East Asian* economies, be suited for a monetary integration? Ling (2001) attempted to answer this question by studying the suitability of twelve APEC countries, namely Japan, Korea, Taiwan, Hong Kong, Singapore, Indonesia, Malaysia, Philippines, Thailand, China, Australia and New Zealand., for a regional monetary arrangement, using annual data from 1967 – 1997. All data were obtained from the World Bank's World Development Indicators CD-ROM, except for Taiwan, data are extracted from local sources. Using the structural VAR, AD-AS premise, Ling tested the underlying macroeconomic disturbances or shocks of real output, measured by real GDP and price level integration, proxied by GDP deflator, to assess the suitability of economies for potential monetary union. Due to the diverse economic circumstances of the sampling economies, Ling suggested that regional monetary co-operation could be a start to establish a smaller currency area.

A multi-speed strategy towards monetary co-operation in East Asia was recommended where smaller sub-groupings could first focus on internal harmonisation with each other and then external harmonisation with other regional sub-groupings as the intermediate and longer-term strategies. In the long run, economies participating in various regional currency areas may consider forming a single currency area once sufficient degree of harmonisation and convergence is achieved. In the mean time, Ling suggested that East Asian economies to focus on promoting greater economic integration through higher levels of trade and investment liberalisation.

In addition, Chow and Kim (2003) examined the symmetry of shocks among East Asian economies. Chow and Kim (2003) used the structural VAR approach, developed by Blanchard and Quah (1989) to run their analysis. They used quarterly data from IMF International Financial Statistics in their study and discovered that East Asia are structurally different and are more likely to face asymmetric shocks. As such, they felt that economic integration in East Asia would be more costly and more difficult to sustain.

Kwak (2004), however, pointed out that East Asia were vulnerable to disturbances from abroad and they faced a high degree of capital mobility across countries. Although each East Asian economies also encounter symmetric disturbances, establishing a potential to form a currency union, the lack of political commitment and experience among East Asian economies make the formation of a currency union quite impossible in the near future. Kwack (2004) went on to advise East Asia to consider forming a quasi-monetary block instead. Kwack reasoned that the majority of East Asian economies have a weak banking system and have a huge external debt denominated in various foreign currencies. Therefore, more free trade agreements, more foreign capital investment, more comprehensive swap arrangements and establishing an organisation to better co-ordinate institutional work towards monetary integration would be essential. In addition, Kwack also suggested that the main players in East Asian economy, China and Japan, to lead in promoting regional monetary and policy co-operation.

Crosby (2003) examined the correlations of Asia-Pacific economies since 1970 to gauge the reaction of domestic economy to disturbances in the US and economies in close geographic proximity. The variables used to explain business cycle synchronisation include trade linkages (ratio of trade with reference to GDP), the similarity of monetary policy (measured by inter-bank rates and standard deviation of the bilateral exchange rate) and structural variables such as the size of the manufacturing sector, geographical proximity and common language.

Crosby explained that closer trade links will lead to more closely synchronised business cycles. More trade would lead to more specialisation, resulting in larger structural differences between economies, and sector specific shocks in one economy would be less likely to affect other economies. Closer trade linkages would lead to stronger demand linkages across countries, as one economy moved into recession, the demand for other countries exports would fall, inducing a fall in other countries output.

Crosby (2003) modelled the bivariate correlation between GDPs of *Asia-Pacific* economies. Data for the analysis was obtained from the International Financial Statistics published by International Monetary Fund, for sampling period between 1980 and 1999. Empirical findings implied that trade did not appear to be very strongly associated with higher correlations between GDPs. However, structural similarity between countries was positively associated with the business cycle correlation.

A more recent paper by Lim (2005) examined the prospect of a *dollar or yen* currency unions in the East Asian region. Monthly nominal exchange rates of US dollar per national currency for each East Asian country were extracted from the Thomson Financial Datastream over the period 1990(1) to 2001(12). The real exchange rates of US dollar per national currency were derived by multiplying the nominal exchange rates with the relative consumer price index of the national currency to the US dollar. The real exchange rates for Japan, Hong Kong, Indonesia, South Korea, Malaysia, Philippines, Singapore and Thailand were used in Lim's VAR and cointegration analysis.

Lim (2005) discovered that co-movements of prices support a common dollar and yen areas for all countries, except Indonesia. There was also evidence of currency convergence for five East Asian countries, namely Hong Kong, Indonesia, Malaysia, the Philippines and Thailand to the

group's average converging trend. Nonetheless, the currency of each country seems to move at a rather constant rate to the Japanese yen over the sampling period. Although none of the East Asian economies currencies had a long-run cointegrating relationship with the Japanese yen, there was a common long-run trend for Hong Kong, South Korea, Philippines, Singapore and Thailand's exchanges. This is an indication of possible currency union for these economies.

On the other hand, Karras (2005) examined the macroeconomic costs and benefits of adopting Yen as a common currency among 18 Asian and Asian Pacific countries. The main benefit of adopting Yen as a common currency is enhanced price stability and exchange rate stability, and thus a lower steady inflation rate. However, adopting a common currency like Yen would rule out the possibility of independent monetary policy which would contribute to higher business cycle volatility if the adopting country's output is not sufficiently synchronised with that of Japan.

Karras (2005) studied the annual real GDP, exchange rates and CPI for the period between 1960 and 2001 for Australia, Bangladesh, China, Hong Kong, Indonesia, India, Japan, Korea, Sri Lanka, Malaysia, Nepal, New Zealand, Pakistan, Philippines, Papua New Guinea, Singapore, Thailand and Taiwan. Real GDP is expressed in PPP-adjusted at constant 1996 prices. Karras discovered that the estimated cost and benefits of adopting Yen varied substantially and are often positively correlated. For instance, Bangladesh and Nepal are found to have a lot to gain as well as lose by using Yen as a common currency. Singapore, Thailand and Taiwan, however, have little to lose or gain from the adoption. Nevertheless, Korea is discovered to have a positive net benefit, an indication of a more favourable candidate for adopting Yen, as compared to Pakistan and Malaysia.

Comparable to Sharma and Chua (2000) and Elliott and Ikemoto's (2004) studies of ASEAN, Kim (2002) used a gravity model to research on trade intensity in ASEAN + 3 economies. The annual exports and imports, distances between two countries' capital cities, nominal and real GDP, as well as nominal and real GDP per capita, for Korea, Japan, China, Hong Kong, Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam from 1980 to 1999 were extracted from the Direction of Trade Statistics Yearbook published by IMF, as well as World Development Indicators 2001, published by the World Bank.

From Kim's standard gravity model's findings, ASEAN's close trade relations with Japan could be explained mostly by the gravity factors, but that was not the case for the ASEAN and China's trading ties. Nonetheless, ASEAN and Korea's increase in trade could not be determined by gravity factors of economic size or income. However, growing trade intensity may arise from a higher degree of economic correlation between trading partners. Over time, bilateral trade has also intensified through the increased in economic size or income effect. Hence, special trade relationship among ASEAN + 3 contributes to the growth of trade intensity within the region.

In contrast, Peridy (2005) investigation on trade effects of the EU-Mediterranean agreements and its implications for ASEAN's new regional policy discovered otherwise. Peridy (2005) modelled the new trade theory based on the generalised gravity equations for 42 partner countries, namely OECD countries (excluding Eastern European countries), South Africa, Brazil, Argentina, Chile, India, Hong Kong, Singapore, Taiwan, Malaysia, the Philippines, Thailand,

China and the Mediterranean countries, for the time period 1975 to 2001. Peridy analysed the GDP per capita between countries, country size, exports from Mediterranean countries to the European Union, distances between capital cities, and dummy variables for bilateral trade costs, regional arrangements between EU and Mediterranean countries, as well as common language used between two countries. It was discovered that EU-Mediterranean's agreements have significantly increased Mediterranean countries' exports to the EU. On the contrary, the ASEAN countries do not enjoy such a regional integration experience, although regional initiatives with Japan, the US, Australia and New Zealand may offer significant trade prospects.

Moreover, Lee, Roland-Holst and Mensbrugghe (2004) suggested that China, Japan and the US to focus on trilateral free trade arrangement and do away with FTAs in East Asia. In their opinion, FTA with East Asia would only benefit smaller ASEAN economies. Lee, *et al* (2004) examined the effects of multilateral and regional trade policy scenarios within China, Japan and the US, based on a dynamic global computable general equilibrium model. They discovered that all three countries would realise large fractions of the residual gains from global trade liberalisation.

The degree of economic integration ranges from establishing free trade areas, customs unions, common markets, economic and political unification. The EU being the best story thus far had been used as a point of reference for many other regional groupings and co-operations. Since the OCA theory provides a theoretical base to examine the possibility of monetary integration among economies, studies related to the EU and the performance of EU after adopting the euro had applied the OCA theory as reference.

Early studies on OCA theory examined the labour mobility, openness and product differentiation of potential member economies. More recent studies on OCA include examining the stable or fixed exchange rate, symmetrical shocks, trade and capital flows, as well as coherent macroeconomic activities through fiscal and monetary co-ordination. Some researchers explored the level of economic interdependence or linkages of macroeconomic aggregate such as trade, capital, labour and technology between states, countries, grouping of countries or regions to explain the degree of economic integration or disintegration within and between economies.

Other Asian economic co-operations especially the ECO and GCC have not been extensively studied, partly due to data limitation. Within ASEAN and East Asian region, however, regional co-operation could range from consultation among peers to permanent policy co-ordination. Some researchers viewed that it is timely to strengthen economic co-operation in the East, while others see the political will and array of economic development in the region as the main obstruction to the final outcome of East Asia regional co-operation.

3.3 Real and monetary compatibility of ASEAN5+3 economies: Some empirical tests

The achievement of a high degree of policy convergence among the ASEAN5+3 member countries is crucial if an Asian Economic Union is to be initiated and the use of rmu to be maximized. Although at the moment policy actions that can be coordinated like the European Monetary System, the Maastricht Criteria, and the Stability and Growth Pact are nonexistent in

this region, an indirect way to evaluate how far the economies are compatible (monetary, fiscal, trade policies etc) can be tested.

In this study, tests for the compatibility among the ASEAN5+3 economies within a long-run framework using cointegration procedures. Using per capita GDP as measure of economic policy, our aim is to determine the number of shared common stochastic trends among the ASEAN5+3 economic policies and test whether a complete convergence of policies has been achieved in the region. Rejection of complete convergence – a finding of two or more shared common trends – indicates that some countries’ policies are set independently, at least in the long-run.

Johansen (1988) as extended in Johansen and Juselius (1990) provides a procedure to investigate the issue of cointegration in a multivariate setting. The question of interest for this study is whether economic policy actions, represented by output converge within the region. In other words, does there exist a long-run relationship between the different countries per capita income as economic policy variables?

To test for cointegration consider a p -dimensional vector autoregression:

$$X_t = \Pi_1 X_{t-1} + \dots + \Pi_k X_{t-k} + \varepsilon_t \quad (t = 1, \dots, T) \quad (3.1)$$

where X_t is a sequence of random vectors with components (x_{1t}, \dots, x_{pt}) . The innovations to this process, the ε 's are drawn from a p -dimensional i.i.d. Gaussian distribution with covariance Λ , and with X_{k+1}, \dots, X_0 fixed. Equation (3.1) is a simple VAR model, which usually estimated in first-difference form because the variables are nonstationary in their levels. This approach leads to a loss of information about the variables’ long-term relationship and, if the series are cointegrated, results in a misspecification of the VAR model.

Let Δ represent the first-difference operator. Equation (3.2) then can be written in the equivalent form

$$\Delta X_t = \Gamma_1 \Delta X_{t-1} + \dots + \Gamma_{k-1} \Delta X_{t-1+k} - \Pi X_{t-k} + \varepsilon_t \quad (3.2)$$

where $\Gamma_i = -I + \Pi_1 + \dots + \Pi_i$ ($i = 1, \dots, k-1$) and $\Pi = I - \Pi_1 - \dots - \Pi_k$.

The difference between a first-difference version of the VAR model and equation (3.2) is the term ΠX_{t-k} . This part of the equation conveys information about the long-run relationship between the variables of the model. If X_t is nonstationary in levels but its first-difference is stationary, then it is said to be integrated of order one. Because there are several elements of the vector that may be cointegrated individually, it may be that one or more linear combinations of these nonstationary elements are stationary. In other words, there may exist more than one linear combination of the variables that converges to some long-run relationship over time.

The test procedure examines the $p \times p$ Π matrix. If this matrix has rank 0 then all elements of Π_t have unit roots and first-differencing is suggested. If the matrix is of full rank p , then all

elements of X_t are stationary in their levels. When $0 < \text{rank}(\Pi) = r < p$, there are r cointegrating relations among the elements of X_t and $p-r$ common stochastic trends. Johansen (1988) and Johansen and Juselius (1990) provide two tests for the rank of Π : the trace test and the maximum eigenvalue test. We employ both tests in our study to examine the sensitivity of the results to using different tests. In the trace test, the null hypothesis that there are at most r cointegrating vectors is tested against a general alternative, whereas in the maximum eigenvalue test the null hypothesis of r cointegrating vectors is tested against the alternative of at least $r+1$ cointegrating vectors.

For our purposes, a necessary (but not sufficient) condition for multi-country policy convergence is that there are $p-1$ cointegrating vectors among p policy measures; that is, r should be equal to $p-1$. Such a finding implies that there is only one common policy trend shared by all countries and there exists a “complete” long-run convergence of policies. A finding of less than $p-1$ but at least one cointegrating vector implies that there is some “partial” convergence of policies: that is, there is more than one common trend. If the number of cointegrating vectors is zero, this indicates that there exists several (p) common trends, but no shared common trends, and suggest no long-run convergence of policies or economic compatibility.

The cointegration test results are reported in Table 3.1. The reported maximum eigenvalue and trace test statistics where both indicate six cointegrating vectors at the 5 percent significance level or better. These results suggest the existence of two common stochastic trends shared by the countries. Our evidence thus implies that the ASEAN5+3 countries have not shared the same common trend, in this respect; Japanese policy could not have been universally shared by others. Our result thus rejects the complete convergence hypothesis and the Japanese dominance hypothesis when considered in a long-run framework.

However, our results do imply that there has been some partial convergence of policies. Finding more than one common trend indicates that policies have converged on several countries’ actions, perhaps even Japan’s. This result means that economic policies have not been set totally independent from others’ actions. As West (1988) argues, varieties of fiscal and monetary policy might have differential effects on national economies, thereby reducing the number of shared stochastic trends.

3.4 The Maastricht Convergence Criteria: Monetary Policy Convergence

Another important aspect where coordination would be needed is ASEAN5+3 countries’ monetary policy. A stable monetary policy is a necessity for any country desiring to provide a favourable environment for its economy by giving confidence to national and international economic actors. To offer a stable environment for trade, it would be necessary to stabilize, and therefore harmonise, the exchange rates between the countries.

Using exchange rate (domestic currency per US\$), money supply M1 and M2 and inflation rate for ASEAN5 plus Korea and Japan as measure of monetary policy coordination, and to determine the number of shared common stochastic trends among the ASEAN5+3 economic policies and test whether a complete convergence of policies has been achieved in the region we employed the Johansen and Juselius (1990) multivariate cointegration test as above (see Tables

3.2 - 3.5) . Rejection of complete convergence – a finding of two or more shared common trends – indicates that some countries’ policies are set independently, at least in the long-run.

Our results indicate that for the four measures of monetary policy indicators, does imply that there has been some partial convergence of policies. Finding more than one common trend indicates that policies have converged on several countries’ actions. This result means that economic policies have not been set totally independent from others’ actions.

Table 3.1: Cointegration Test Results for the Output of ASEAN5+3 Economies

Null hypothesis	Maximum Eigenvalue Test		Trace Test	
	λ -Max statistics	5% Critical Value	Trace statistics	5% Critical Value
$r = 0$	135.55**	51.42	386.00**	156.00
$r \leq 1$	81.37**	45.28	250.45**	124.24
$r \leq 2$	52.16**	39.37	169.07**	94.15
$r \leq 3$	46.51**	33.46	116.90**	68.52
$r \leq 4$	33.75**	27.07	70.39**	47.21
$r \leq 5$	23.26*	20.97	36.64**	29.68
$r \leq 6$	11.98	14.07	13.37	15.41
$r \leq 7$	1.39	3.76	1.39	3.76

Notes: Asterisks (**), (*) denote statistically significant at 1% and 5% level respectively.

Table 3.2: Cointegration Test Results for Money Supply M1 of ASEAN5+3 Economies

Null hypothesis	Maximum Eigenvalue Test		Trace Test	
	λ -Max statistics	5% Critical Value	Trace statistics	5% Critical Value
$r = 0$	124.20**	45.28	356.20**	124.24
$r \leq 1$	93.99**	39.37	232.00**	94.15
$r \leq 2$	57.56**	33.46	138.00**	68.52
$r \leq 3$	41.27**	27.07	80.44**	47.21
$r \leq 4$	27.56**	20.97	39.17**	29.68
$r \leq 5$	11.60	14.07	11.61	15.41
$r \leq 6$	0.01	3.76	0.01	3.76

Notes: Asterisks (**), (*) denote statistically significant at 1% and 5% level respectively.

Table 3.3: Cointegration Test Results for Money Supply M2 of ASEAN5+3 Economies

Null hypothesis	Maximum Eigenvalue Test		Trace Test	
	λ -Max statistics	5% Critical Value	Trace statistics	5% Critical Value
$r = 0$	106.55**	45.28	326.80**	124.24
$r \leq 1$	77.55**	39.37	220.25**	94.15
$r \leq 2$	63.05**	33.46	142.69**	68.52
$r \leq 3$	42.54**	27.07	79.64**	47.21
$r \leq 4$	17.98	20.97	37.10**	29.68
$r \leq 5$	16.51*	14.07	19.11*	15.41
$r \leq 6$	2.60	3.76	2.60	3.76

Notes: Asterisks (**), (*) denote statistically significant at 1% and 5% level respectively.

Table 3.4: Cointegration Test Results for the Exchange Rate of ASEAN5+3 Economies

Null hypothesis	Maximum Eigenvalue Test		Trace Test	
	λ -Max statistics	5% Critical Value	Trace statistics	5% Critical Value
$r = 0$	160.94**	45.28	394.51**	124.24
$r \leq 1$	90.29**	39.37	233.57**	94.15
$r \leq 2$	75.79**	33.46	143.28**	68.52
$r \leq 3$	32.48**	27.07	67.48**	47.21
$r \leq 4$	24.45**	20.97	35.00**	29.68
$r \leq 5$	10.54	14.07	10.55	15.41
$r \leq 6$	0.00	3.76	0.00	3.76

Notes: Asterisks (**), (*) denote statistically significant at 1% and 5% level respectively.

Table 3.5: Cointegration Test Results for the Inflation Rate of ASEAN5+3 Economies

Null hypothesis	Maximum Eigenvalue Test		Trace Test	
	λ -Max statistics	5% Critical Value	Trace statistics	5% Critical Value
$r = 0$	63.59**	45.28	183.77**	124.24
$r \leq 1$	38.78	39.37	120.18**	94.15
$r \leq 2$	28.07	33.46	81.40**	68.52
$r \leq 3$	22.59	27.07	53.32*	47.21
$r \leq 4$	21.15*	20.97	30.72*	29.68
$r \leq 5$	9.19	14.07	9.56	15.41
$r \leq 6$	0.37	3.76	0.37	3.76

Notes: Asterisks (**), (*) denote statistically significant at 1% and 5% level respectively.

4.0 Macroeconomic Compatibility of ASEAN-5 Plus 3¹

4.1 Background

In Asia, the Association of Southeast Asian Nations, ASEAN², is arguably the most successful economic organisation, formed in 1967, to foster closer political ties as well as to strengthen economic co-operation within the South Eastern region of Asia. Economic co-operation, the lesser degree of an economic integration, is en route for the formation of an economic union³.

After almost 15 years since ASEAN established a framework to an ASEAN free trade area, commonly known as AFTA, in 1992, there was no significant development of the so called “free trade area”. Perhaps, it was due to a series of unpleasant events like the 1997 Asian financial crisis, international terrorism, natural catastrophes such as earth quakes and tidal waves, the tsunami, as well as the outbreak of diseases like the Severe Acute Respiratory Syndrome (SARS) and the Avian flu, that hindered the development of AFTA. Nonetheless, these ghastly events also indicated the need for regional co-operation to avoid or mitigate aggravation of future adverse shocks.

In view of ASEAN’s diverse social, economical and political background, it is therefore difficult to ascertain if ASEAN is compatible for economic unity. Converged or synchronised economies would respond to one integrated monetary policy when united. Therefore, there must be certain commonality among economies to enable them to converge and move in coherence. The reasons that encourage ASEAN economic co-operation may arise from its democratic political belief, with the exception for Myanmar, its locality within the Asia-Pacific region, and its huge market opportunities. Moreover, the real GDP, adjusted for purchasing power parity (PPP)⁴, for ASEAN-5 has narrowed down quite substantially in recent years. With the exception of Singapore, being the smallest and least populated in Southeast Asia, has a commendable real GDP per capita, also PPP adjusted, as compared to other ASEAN-5 members. Table 4.1 exhibits.

Besides, through ASEAN’s annual East Asia summit, the former has attracted numerous Asian (Japan, China, Korea and India) as well as non-Asian countries (like Russia and Australia), to form an ally, economically with ASEAN. Thus, it is the motivation of this study is to address issues with regards to economic compatibility of these diverse, yet not contradicting, ASEAN-5, Japan, China and Korea economies, known as the ASEAN-5 plus 3 hereafter, to establish successful regional co-operation.

¹Discussion in this section is extracted from Ong (2006).

² In no particular order, Indonesia, Malaysia, the Philippines, Singapore and Thailand established the ASEAN on 8 August, 1967 in Bangkok. Brunei (joined in 1984), Vietnam (joined in 1995), Laos and Myanmar (joined in 1997) and Cambodia (joined in 1999), are the newer members of ASEAN.

³ An economic union involves at least four stages of evolution, from a free trade area, a custom union, a common market and finally an economically and politically united economy (Balassa, 1961).

⁴ In order to accommodate international comparison, both real GDP and real GDP per capita are adjusted for PPP based on elaboration by Kravis, *et al.* (1978) and Salazar-Carrillo and Alonso (1988). Annual data for the computation are extracted from the World Development Indicator 2004.

Table 4.1: Real GDP of ASEAN-5⁵, Japan, China and Korea, 1995 - 2002

Real GDP per Capita @PPP (in USD)								
	China	Indonesia	Japan	Korea	Malaysia	Philippines	Singapore	Thailand
1995	25	28	226	115	71	34	179	59
1996	26	28	237	118	75	33	190	60
1997	27	27	240	120	78	32	193	57
1998	30	16	238	106	68	29	190	48
1999	33	13	243	117	71	28	205	50
2000	35	13	256	125	77	28	228	52
2001	39	12	264	126	75	27	218	53
2002	42	11	270	130	76	27	229	56

Real GDP @PPP (in million USD)								
	China	Indonesia	Japan	Korea	Malaysia	Philippines	Singapore	Thailand
1995	7,002.80	2,021.30	53,038.00	4,892.60	888.32	741.20	839.31	1,679.00
1996	7,162.68	2,007.56	48,306.59	4,858.56	969.22	717.34	923.58	1,670.40
1997	7,630.05	1,711.35	43,882.97	4,178.55	934.88	651.23	939.70	1,272.80
1998	8,302.24	309.39	40,147.13	2,441.73	617.24	434.76	823.65	820.39
1999	9,142.71	320.31	46,785.55	3,143.46	655.22	455.96	835.88	911.13
2000	10,250.29	325.18	52,241.34	3,532.20	748.35	431.41	945.45	916.31
2001	11,362.80	250.62	47,791.28	3,105.76	730.10	373.95	884.38	858.29
2002	12,622.91	250.84	47,290.25	3,333.60	771.86	386.74	927.78	946.29

This section aims to evaluate real macroeconomic convergence of the combination of ASEAN-5, Japan, China and Korea economies to form a fruitful regional co-operation. Specifically, this study is conducted in five folds. (i) *to examine the degree of cointegration of the combinations of ASEAN-5 plus 3 economies*. The long run macroeconomic relationship of the combination of ASEAN-5, Japan, China and Korea is measured by their respective real gross domestic product. (ii) *to determine the compatibility of the combinations of ASEAN-5 plus 3*. The exclusion restriction analysis would indicate the importance of each economy in the grouping. (iii) *to determine the time-varying convergence of ASEAN-5 plus 3*. Since time series may be cointegrated but the degree of cointegration may change over time due to changes in parameters or stochastic properties, the time varying cointegration analysis would be appropriate to detect gradual change of the degree of convergence. (iv) *to ascertain the speed of convergence of the combinations of ASEAN-5 plus 3*. The time profiles of shocks on the cointegrating relations can provide insights into the system's speed of convergence to the long run equilibrium. (v) *to choose among the alternatives Asia Monetary Units (AMUs)*.

Past studies

Since monetary and fiscal policies amalgamation is the key characteristic of an economic union, many studies addressed the issues of economic integration with regards to the optimum currency

⁵ ASEAN-5 refers to the five initial members that formed ASEAN, namely Indonesia, Malaysia, Philippines, Singapore and Thailand.

area (OCA) theory, a theory that states the necessary criteria prior to a monetary union. In essence, early views of the OCA theory stressed on the importance of labour mobility (Mundell, 1961), openness of an economy (McKinnon, 1963) and product differentiation (Kenen, 1969) as criteria necessary to form an OCA. These OCA criteria state the factors that would nullify the cost of giving up monetary independence when an OCA is established.

Thus, based on these fundamental criteria, recent studies have examined other factors that may be essential to form an OCA. These criteria include smaller size and trade dependent economies (Bayoumi and Eichengreen, 1998), monetary convergence (Brendin and Fountas, 1998), linkages and coherence of real macroeconomic and monetary variables (Dueker and Wesche, 2001; Sayek and Selover, 2002; Hallet and Piscitelli, 2002; Shin and Wang, 2003, to name a few). The prime advantage of maintaining a separate currency across countries is the ability to smooth business cycle fluctuations through independent and counter-cyclical monetary policy, their high degree of business cycles correlation and the huge amount of trade, signal for a possible economic and monetary co-operation (Coleman, 1999). Economies with harmonised or converged macroeconomic activities prompt the suitability of economic integration because these economies would respond to one common monetary policy. Hence, it would be less costly to give up monetary policy independence for the sake of an economic union.

4.2 Estimation Technique

All series under investigation are in log transformation. Firstly, the standard Augmented Dickey-Fuller (ADF) and the KPSS (developed by Kwiatowski, Phillips, Schimdt, and Shin, 1992) tests were conducted to test for the existence of unit root problems in all series. The real macroeconomics aggregate is examined as follows.

$$Y_{Aj_i} \equiv (Y_{A1}, Y_{A2}, \dots, Y_{A8}) \quad (1)$$

where $j = 1, 2, \dots, 8$; A1 represents Indonesia, A2 Malaysia, A3 Philippines, A4 Singapore, A5 Thailand, A6 Japan, A7 China and A8 Korea; while Y represents log of real gross domestic product. If Y_{Aj_i} is cointegrated, it can be generated by a vector error correction model (VECM). As given by a VAR of order ρ ,

$$y_t = \hat{\theta}_0 + \hat{\theta}_1 y_{t-1} + \dots + \hat{\theta}_\rho y_{t-\rho} + \hat{\alpha} d_{t-1} + \hat{\varepsilon}_t \quad (2)$$

$$\Delta y_t = \Pi_0 + \sum_{i=1}^{k-1} \Pi_i \Delta y_{t-i} + \Pi y_{t-1} + \hat{\alpha} d_t + \varepsilon_t \quad (3)$$

where d_t is a vector of deterministic variables, $\Delta y_t = y_t - y_{t-1}$, $\Pi_0 = \hat{\theta}_0$, $\Pi_i = -\sum_{j=i+1}^{\rho} \hat{\theta}_j$ and

$$\Pi = \sum_{i=1}^{\rho} \hat{\theta}_i - 1$$

The trace statistic tests the null hypothesis if at most r cointegrating vectors among a system of n time series exists, where $0 \leq r \leq n$, for $H_0 : r \leq r_0$ against the $H_1 : r > r_0$. The trace statistics is computed as follows.

$$\text{Trace} = -T \sum_{i=r+1}^n \ln(1 - \hat{\lambda}_i) \quad (4)$$

where $\hat{\lambda}_i$ are the estimated eigenvalues from Π and it is the $n-r$ smallest squared canonical correlations of Y_{t-1} with respect to Δy_t corrected for lagged differences. T is the sample size actually used for estimation. If the null hypothesis could not be rejected, that reveals a common stochastic trend, an implication of a considerable degree of integration among the economies.

Next, let each coefficient of the combinations of ASEAN-5, Japan, China and Korea economies to be equivalent to zero. The null hypothesis of the exclusion restriction analysis tests if GDP is statistically equivalent to zero across all vectors. Using the chi-square test, the rejection of the null hypothesis implies that all economies within the group enter their cointegrating vector(s) significantly. The results of the exclusion restriction test would reveal if countries are suitable to be united, economically.

Although the conventional convergence test is appropriate to test for convergence for the entire sample period, it would not be able to capture the ongoing converging process of the economies under study. Hence, the time varying convergence estimation introduced by Brada, Kutan and Zhou (2005), is deployed in a multivariate context to examine the degree of convergence during different sub-sample period of the full sample using Johansen cointegration rank tests⁶. The trace statistics, scaled by adjusted 95% critical values, are obtained by using $40 + k$ observations sample frame, where k is the lag length determined via Schwarz Information Criterion (SIC). Thus, a value of greater than 1 indicates rejection of the null hypothesis of no cointegration at 5% level.

It follows that the generalised impulse response function (GIRF) could bring to light the speed of adjustment in the system following a specific impulse. The GIRF can distinguish the impact of an exogenous shock or innovation in one variable on the other variable of the system. Suppose a standard deviation increases in the n^{th} variable shock is introduced at date t , and then it is returned to zero thereafter. Assuming that other variables are constant at all times, t , the path of variable $Y_{h,t}$ in response to a one time change in $Y_{n,t}$, is known as the IRF. Thus, the GIRF can be defined as follows:

$$\text{The GIRF}(m, \varepsilon_t, \omega_{t-1}) = E[Y_{t+m} | \varepsilon_{jt}, \omega_{t-1}] - E[Y_{t+m} | \omega_{t-1}] \quad (5)$$

⁶ In this study, we used the existence of cointegration between series, rather than the correlation of shocks, to test convergence hypothesis (see also Koónda, 2001 and Brada and Kutan, 2001).

The GIRF is a random variable given by the difference between two random, conditional expectations, namely the expectation of Y_{t+m} conditional on history ($\mathcal{O}_{t-1} \subseteq \phi_{t-1}$) and the chosen shock $\varepsilon_{j,t}$. Hence, all other contemporaneous and future shocks are integrated out. The second component is the baseline profile of the conditional expectation of Y_{t+m} given the observed history.

Finally, quarterly data used for this study is extracted from the IMF International Financial Statistics for the sampling period from 1980:Q1 to 2004:Q4. Unavailable quarterly series are interpolated using Chow and Lin (1971) procedure.

4.3 Empirical Findings

Before testing for cointegration we tested for unit root. At 5% level of significance, the ADF tests reveal that all series, at constant and with trend, are not stationary, at level but are stationary after taking the first difference. KPSS tests also suggest that all series, at constant and with trend, are $I(1)$ at 5% level of significance. Thus, all the variable are $I(1)$, meaning that first differencing is required to achieve stationary. Table 4.2 summarized the results of these univariate unit root tests.

Given that all the series are $I(1)$, we proceeded to test for cointegration. Lag length is chosen by applying the SIC on undifferenced VAR. The Johansen-Juselius tests for multiple cointegrating vectors are reported in Table 4.2. The trace tests of the null hypothesis of no cointegrating vector for GDP of ASEAN-5 is rejected at 1% (5%) level, an indication of one (two) cointegrating vector for GDP of ASEAN-5. As for GDP of ASEAN-5 and Japan; GDP of ASEAN-5, China and Korea; as well as GDP of ASEAN-5, Japan and Korea; the trace statistics rejects the null hypothesis of at most two cointegrating vector at 1% level, an indication of three cointegrating relationships in these groups of economies. GDP of ASEAN-5 and Korea's trace statistics also rejects the null hypothesis of one cointegrating vector at 1% level, an indication of two cointegrating vectors. Moreover, the trace statistics for GDP of ASEAN-5 and China, as well as GDP of ASEAN-5, Japan and China rejects the null hypothesis of at most two and three cointegrating vectors at 1% and 5% levels of significance, respectively. The trace statistics also suggests that GDP of ASEAN-5, Japan, China and Korea has four (five) cointegrating relationships at 1% (5%) levels, respectively. Table 4.3 illustrates.

According to theory, cointegrated variables cannot drift apart, and as such this means that the countries in the group were able to maintain a level of macroeconomic disciplined consistent with an optimal currency area. They have achieved a measure of convergence.

Next, the exclusion restriction test reveals two possible groups of economies, namely ASEAN-5 as well as ASEAN-5, Japan and China, where each economy within the group enters their cointegrating vector(s) significantly. Table 4 illustrates.

Subsequently, the time-varying cointegration is analysed to detected gradual convergence in ASEAN-5 as well as ASEAN-5, Japan and China. The time-varying convergence test for GDP

of ASEAN-5 reveals at least one cointegrating relationship for the whole sample frame rolling forward at 42 observations throughout the whole sample. However, panel two of Figure 4.1 indicates a possible cv2 from 1992:Q1 sampling frames onwards.

In addition, at 5% level, the rolling cointegration of trace statistics for GDP of ASEAN-5, Japan and China indicates at least four cointegrating relationship for the whole sample frame rolling forward at 43 effective observations. Figure 4.2 illustrates.

The result of the generalised impulse response for the ASEAN-5 is shown in Figure 4.3. All the long run relations of GDP of ASEAN-5 converge to zero after the effect of the shocks dies away, although the time paths have different shapes for different shocks. The life of shocks ranges from approximately 16 to 20 quarters. The impulse responses of GDP of ASEAN-5 to a one standard deviation shock in the CV of Singapore's GDP and CV's of Thailand's GDP resume to their pre-shock level after 19 quarters. As for one standard deviation shock of GDP of Indonesia, Malaysia, and Philippines, all responses of ASEAN-5 economies resume to their pre-shock levels after approximately 17, 16 and 17 quarters, respectively.

The GDP of ASEAN-5, Japan and China, however, relate relatively slower response as compared to the GDP of ASEAN-5. A one standard deviation shock of GDP of Indonesia, Malaysia and Singapore reveals an approximate impulse response of the group of less than 35 quarters to resume to their pre-shock levels. The life of Thailand's GDP shocks reveals a quicker response of approximately 25 quarters.

On the other hand, the group of ASEAN-5, Japan and China economies exhibits impulse responses of approximately 35 to 40 quarters when one standard deviation of GDP for each Philippines, Japan and China is shocked independently. The impulse response of the CVs of each ASEAN-5, Japan and China economy is illustrated in Figure 4.4.

Table 4.2: Results for ADF and KPSS

Variables	ADF				KPSS			
	At Levels		First Difference		At Levels		First Difference	
	Constant (t_{μ})	Trend (t_{τ})	Constant (t_{μ})	Trend (t_{τ})	Constant (Zt_{μ})	Trend (Zt_{τ})	Constant (Zt_{μ})	Trend (Zt_{τ})
LnY_Jp	-1.3366(1)	-1.3485(1)	-4.9080(2)**	-4.9120(2)**	1.0819(8)**	0.2578(8)**	0.2480(3)	0.0646(3)
LnY_Indo	-0.7235(1)	-2.2414(1)	-5.4348(1)**	-5.4104(1)**	1.0217(8)**	0.1795(8)*	0.0794(4)	0.0571(4)
LnY_Ko	-0.6158(1)	-2.0947(1)	-6.6931(1)**	-6.6652(1)**	1.051682(8)**	0.1523(8)*	0.07041(3)	0.0715(3)
LnY_My	-0.8829(2)	-2.1930(2)	-4.1691(3)**	-4.1526(3)**	1.0175(8)**	0.2035(8)*	0.0727(9)	0.0770(9)
LnY_Ph	-1.8632(2)	-1.7056(2)	-3.4612(4)*	-3.7436(4)*	1.0751(8)**	0.2011(8)*	0.1975(4)	0.040(4)
LnY_Sp	-1.2778(2)	-0.7935(2)	-3.5306(6)**	-3.6908(6)*	1.17510(8)**	0.2245(8)**	0.2204(5)	0.0914(7)
LnY_Th	-1.3588(1)	-1.4051(1)	-6.5666(1)**	-6.5346(1)**	0.5433(8)*	0.2271(8)**	0.1254(4)	0.1096(4)
LnY_Ch	-1.5945(4)	-1.1154(4)	-3.4359(3)*	-3.6166(3)*	0.5488(8)*	0.2432(8)**	0.1657(4)	0.0797(4)

Notes: *(**) denotes rejection of the null hypothesis at the 5%(1%) level.

Table 4.3: Multivariate Cointegration Test of GDP

Hypothesis	ASEAN5	ASEAN5 and Japan	ASEAN5 and China	ASEAN5 and Korea	ASEAN5, Japan and China	ASEAN5, China and Korea	ASEAN5, Japan, and Korea	ASEAN5, Japan, China and Korea	
Trace test									
H_0	H_1								
$r = 0$	$r > 0$	102.91**	173.356**	142.64**	127.68**	215.425**	180.724**	202.325**	278.774**
$r \leq 1$	$r > 1$	52.383*	111.72**	91.588**	80.502**	143.887**	116.149**	138.167**	193.629**
$r \leq 2$	$r > 2$	19.406	62.787**	55.828**	47.102	88.768**	78.864**	87.252**	127.625**
$r \leq 3$	$r > 3$	6.709	29.322	29.814*	21.815	51.313*	46.912	42.443	84.332**
$r \leq 4$	$r > 4$	1.951	10.609	8.986	8.171	18.527	22.167	23.169	53.85*
$r \leq 5$	$r > 5$		2.687	1.477	1.993	6.21	9.168	11.205	30.209
$r \leq 6$	$r > 6$					1.324	1.775	2.813	11.684
$r \leq 7$	$r > 7$								0.816

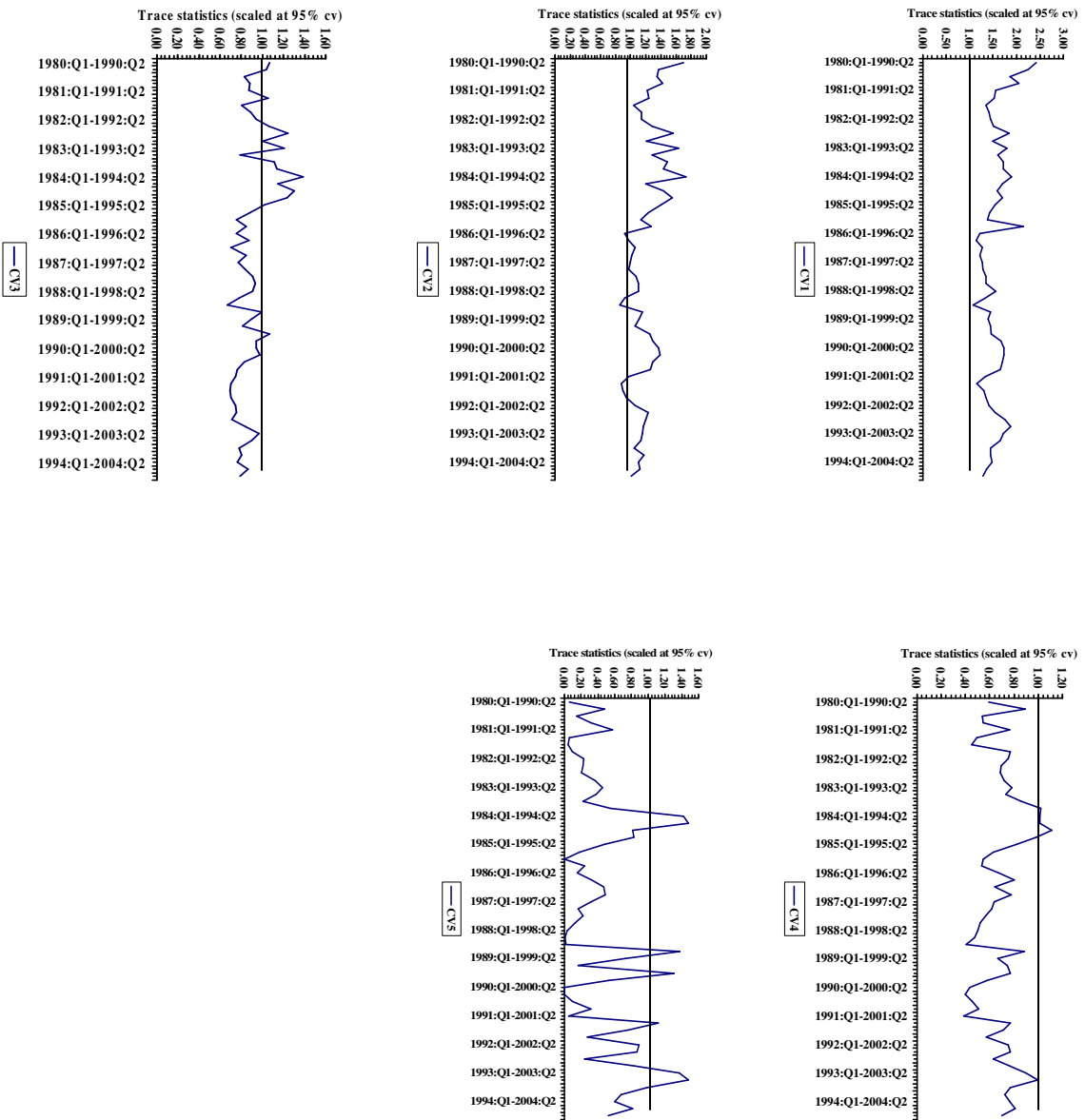
Notes: *(**) denotes rejection of the hypothesis at the 5%(1%) level.

Table 4.4: Exclusion Restriction Test

Cointegration Restrictions	ASEAN-5	ASEAN-5 and Japan	ASEAN-5 and China	ASEAN-5 and Korea	ASEAN-5, Japan and China	ASEAN-5, China and Korea	ASEAN-5, Japan, and Korea	ASEAN-5, Japan, China and Korea
	χ^2							
LnY_Indo	60.8683**	34.6424**	26.8504**	7.1549**	36.8315**	3.5241	30.5709**	30.4761**
LnY_My	27.6644**	27.1369**	7.3374*	0.0079	16.0690**	1.4733	30.320**	7.2953
LnY_Ph	21.4149**	31.5315**	11.2049*	8.2017**	29.1583**	0.0692	35.0675**	24.9074**
LnY_Sp	61.1790**	37.4691**	27.6084**	5.8198*	38.3464**	3.6804	23.2901**	30.9129**
LnY_Th	56.2131**	33.1360**	21.1535**	7.5293**	30.5941**	1.8961	25.0755**	19.6096**
LnY_Jp	-	6.3145	0.1847	-	17.3740**		5.7557	2.007
LnY_Ch	-	-	2.3647	-	18.4184**	1.9509		18.5862**
LnY_Ko	-	-	-	0.0813	-	1.7262	7.3314	19.6453**

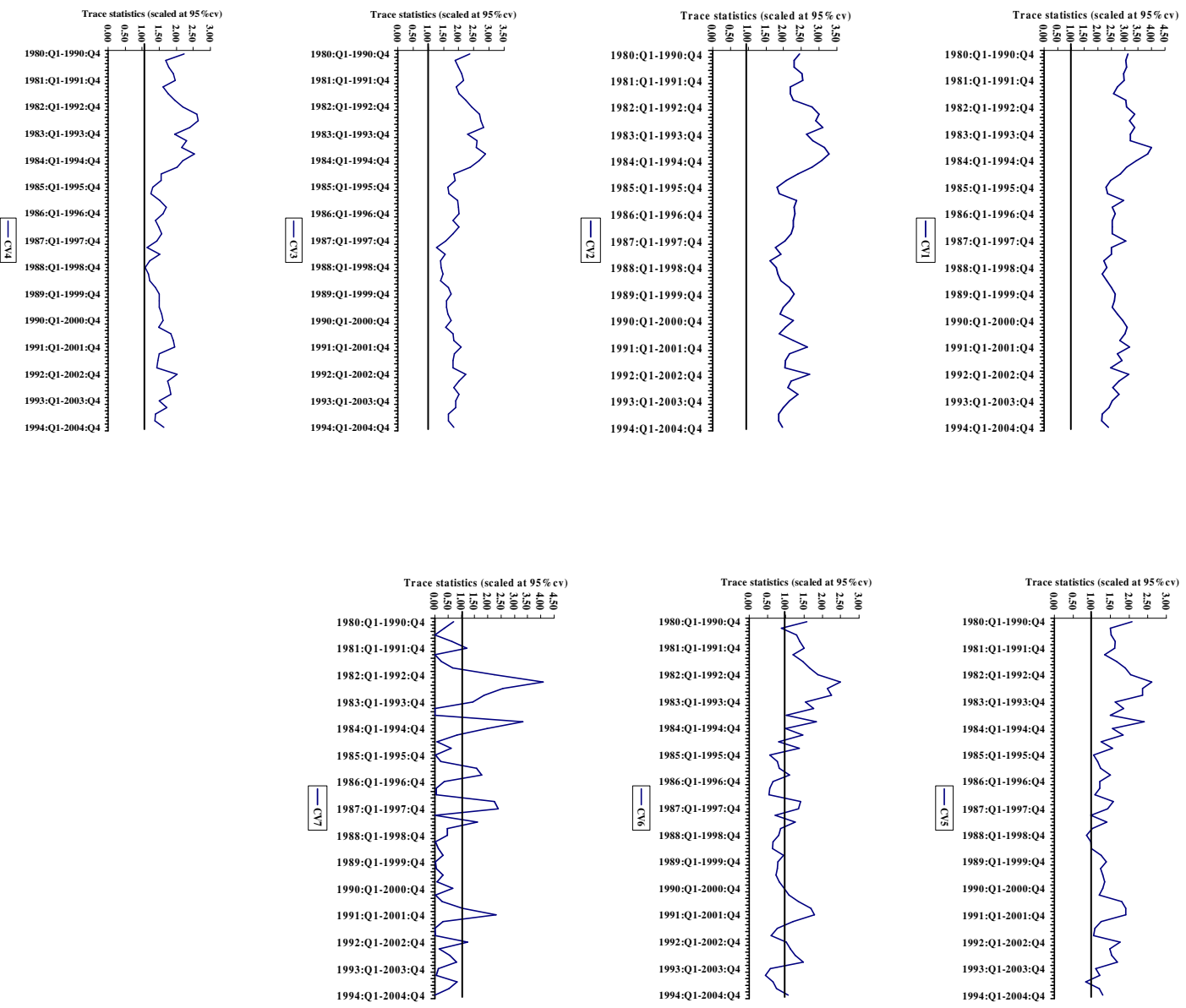
Notes : Figures denote the likelihood ratio statistics of asymptotically distributed χ^2 . * and ** denotes significance at 5% and 1% level respectively.

Figure 4.1: Time-varying Convergence for GDP of ASEAN-5



Notes: The vertical axis in Fig. 2 indicates the value of the test statistic (trace test) for the null hypothesis of no cointegration. For values greater than one, we cannot reject null hypothesis of no cointegration at 10% significance level.

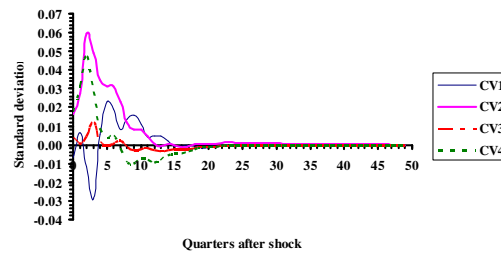
Figure 4.2: Time-varying Convergence for GDP of ASEAN-5, Japan and China



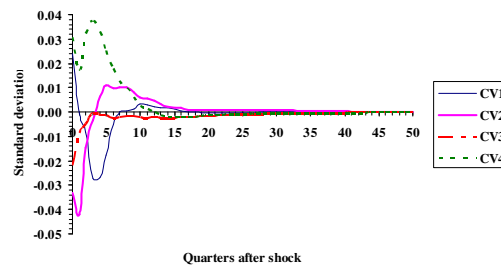
Notes: The vertical axis in Fig. 2 indicates the value of the test statistic (trace test) for the null hypothesis of no cointegration. For values greater than one, we cannot reject null hypothesis of no cointegration at 10% significance level.

Figure 4.3: Generalized Impulse Responses of Long Run Relations for ASEAN-5, Japan and China

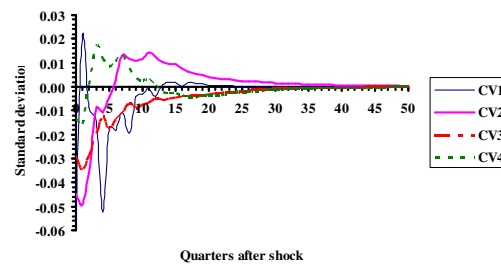
One standard deviation shock in the equation for Indonesia



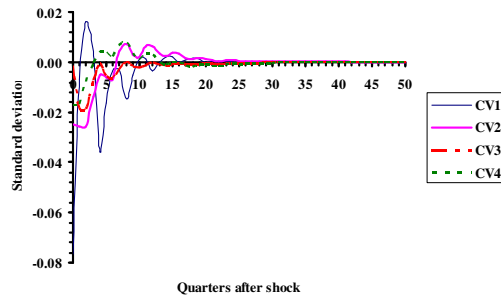
One standard deviation shock in the equation for Malaysia



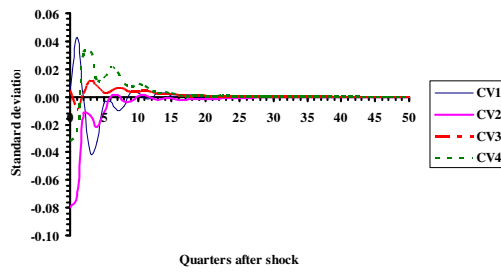
One standard deviation shock in the equation for Philippines



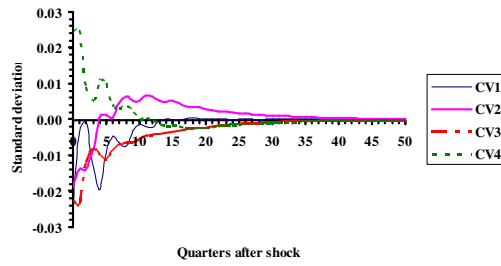
One standard deviation shock in the equation for Singapore



One standard deviation shock in the equation for Thailand



One standard deviation shock in the equation for Japan



One standard deviation shock in the equation for China

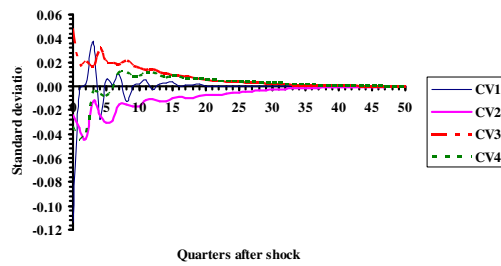
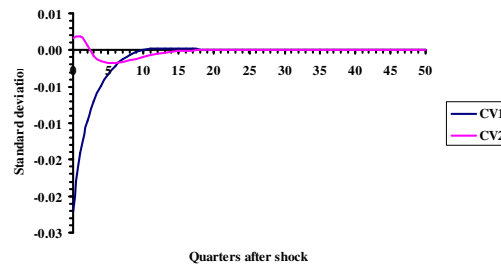
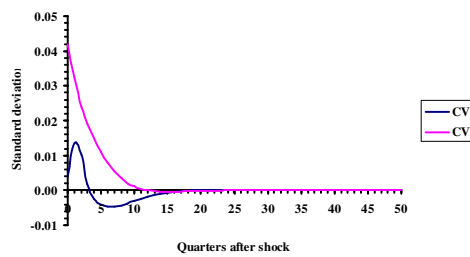


Figure 4.4: Generalized Impulse Responses of Long Run Relations for ASEAN-5

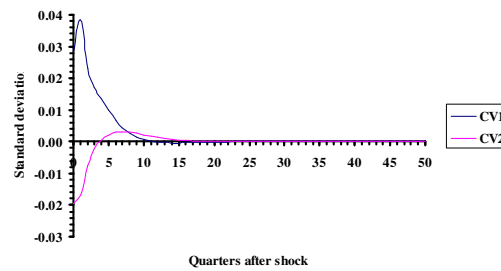
One standard deviation shock in the equation for Indonesia



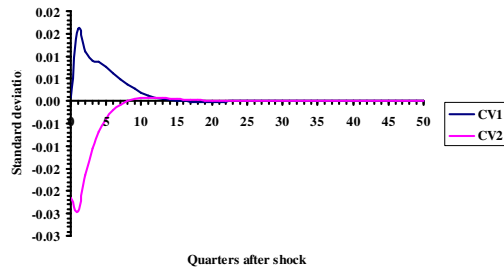
One standard deviation shock in the equation for Malaysia



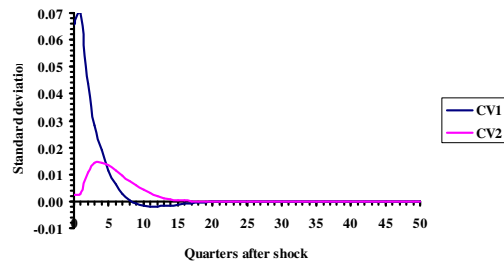
One standard deviation shock in the equation for Philippines



One standard deviation shock in the equation for Singapore



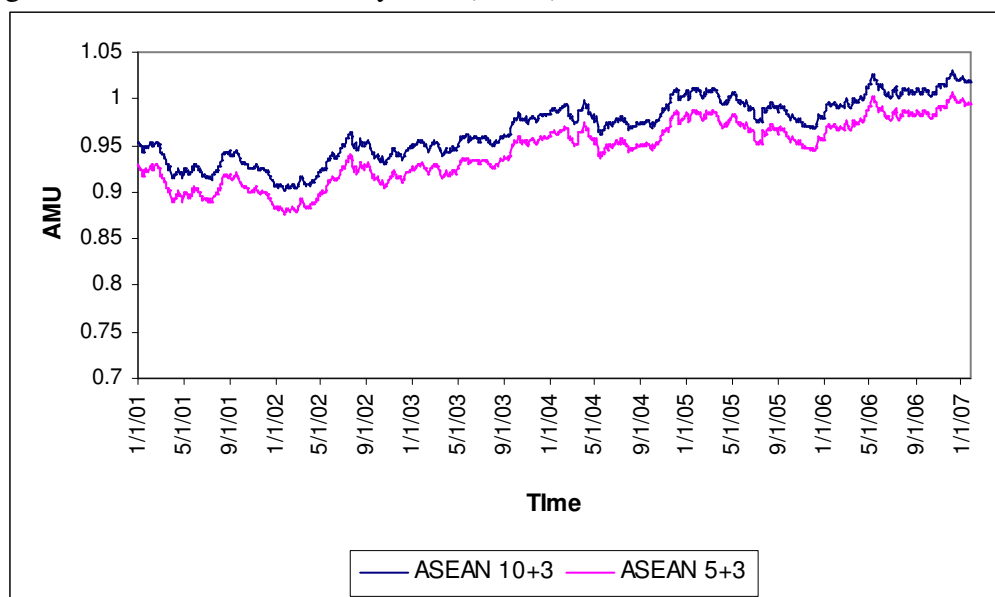
One standard deviation shock in the equation for Thailand



4.4 Comparing the Composition of Asian Monetary Unit (AMU)

In this section we compare the composition of AMU between the benchmark indicator proposed by Ogawa and Shimizu (2005, 2006) that consists of ASEAN 10 + 3 currencies, and ASEAN 5 + 3 currencies. Figure 4.5 presents the two AMUs, where the AMU of ASEAN 5 + 3 is obtained by using different weights of East Asian currencies following the Ogawa's approach⁷. As shown in this figure, these two AMUs are stable over the sampling period from January 2001 to January 2007 (daily data), and both of the series show an upward trend. We noticed that the ASEAN 5 + 3 series tend to track close (no delay) the major turning points of the ASEAN + 10 series.

Figure 4.5: The Asian Monetary Unit (AMU) of ASEAN 10 + 3 and ASEAN 5 + 3



In order to examine the behaviour of these two AMUs in terms of their variability (volatility), we relied on the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) volatility model developed by Bollerslev (1986). Put differently, we proxy exchange rate volatility under the two arrangements by their conditional variance of the return series. It should be noted that majority of the existing literature has used the Bollerslev's GARCH (1,1) in modelling the volatility of exchange rate series. We test for the stationarity properties for the two monetary units of measurements using the usual ADF and Phillips-Perron tests. Results of the tests (not reported) indicate that the series in level are nonstationary. On the other hand, when the ADF and Phillips-Perron tests were carried out on the first differences of the series, the null of unit root is strongly rejected. Therefore, the order of integration of our time series does not exceed one—that is $I(1)$.

⁷ The AMU and AMU deviation indicators data sets, as well as the AMU weights of East Asian currencies are available at: <http://www.rieti.go.jp/users/amu/en/index.html>

Figures 4.6 and 4.7 present the compounded rate of return of two AMUs, namely ASEAN 10 + 3 and ASEAN 5 + 3, respectively. The daily AMU return series on day t ($RAMU_t$) is generated as follows:

$$RAMU_t = 100 \times (\log AMU_t - \log AMU_{t-1})$$

The return series is therefore the time series of continuously compounded daily returns expressed as a percentage. The comparison between the volatility of these two AMU's returns are based on the conditional and unconditional variances of GARCH(1,1) model of the rate of return series.

Figure 4.6: Compounded Daily Returns of AMU based on ASEAN 10+ 3

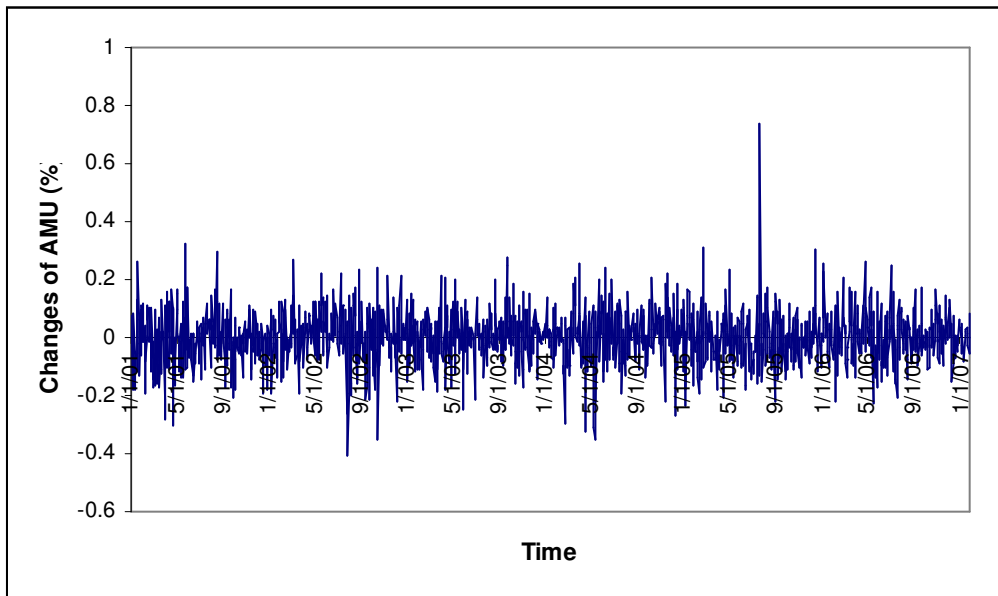
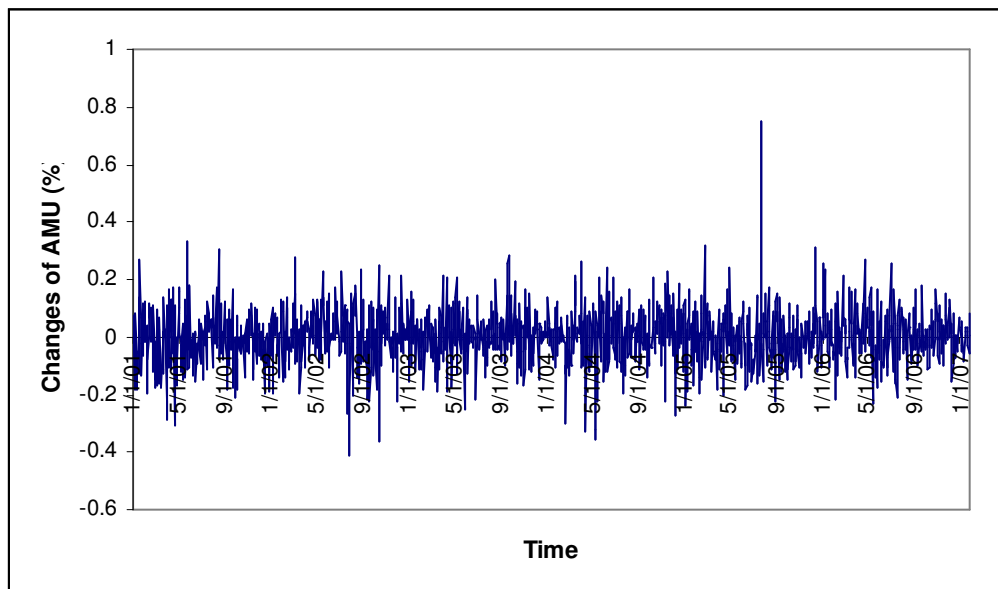


Figure 4.7: Compounded Daily Returns of AMU based on ASEAN 5+ 3



According to Pagan and Schwert (1990) and Pagan (1996), the GARCH models perform well in comparison with alternative methods for modeling conditional volatility, except for a possible asymmetric leverage effect, a GARCH(1,1) is enough to account for the volatility dynamics of most financial time series⁸. The GARCH(1,1) specification with normal distribution is carried out to model the volatility of two AMUs' returns, which when fitted to the data in Figures 4.6 and 4.7 over the sample period January 2001 to January 2007, gives the empirical results that presented in Table 4.5.

As shown in Table 4.5, the coefficients on all three terms in the conditional variance equation are highly statistically significant. The ϕ coefficient reveals that volatility clustering is observed. The relatively large coefficient on the ϕ (0.93) implies that if volatility is high (low), it stays high (low) for some time – that is, it is autoregressive. The sum of the ARCH and GARCH terms ($\alpha + \phi$), which is a measure of the persistence of shocks to exchange rate volatility ranges between 0.932 and 0.958. These parameters are quite close to unity, indicating that the persistence of the conditional variance of the AMUs are high in East Asian countries. Since the sum of both coefficients are less than one, the residuals are covariance stationary and we can compute the unconditional variance, which is equal to $\omega(1 - \sum_{i=1}^q \alpha_i - \sum_{j=1}^p \phi_j)^{-1}$.

As shown in Table 4.5, the unconditional variances that is composed of ASEAN 5 + 3 is slightly higher than ASEAN 10 + 3, where the unconditional volatility of ASEAN 5 + 3 and ASEAN 10 + 3 are 0.008476 and 0.008105, respectively, which implies a standard deviation of 0.09000 (9% per day) and 0.09206 (9.2% per day). We note that Ljung-Box Q test statistic (12 lags) for the standardized residuals and the squared standardized residuals are insignificant at the standard significance levels, thus indicating no further first or second-order serial dependence.

⁸ Most recently, Schwert (2002) also employed a GARCH(1,1) to model conditional variance for the Nasdaq.

Table 4.5: GARCH(1,1) Parameter Estimation of AMUs based on Normal Distribution

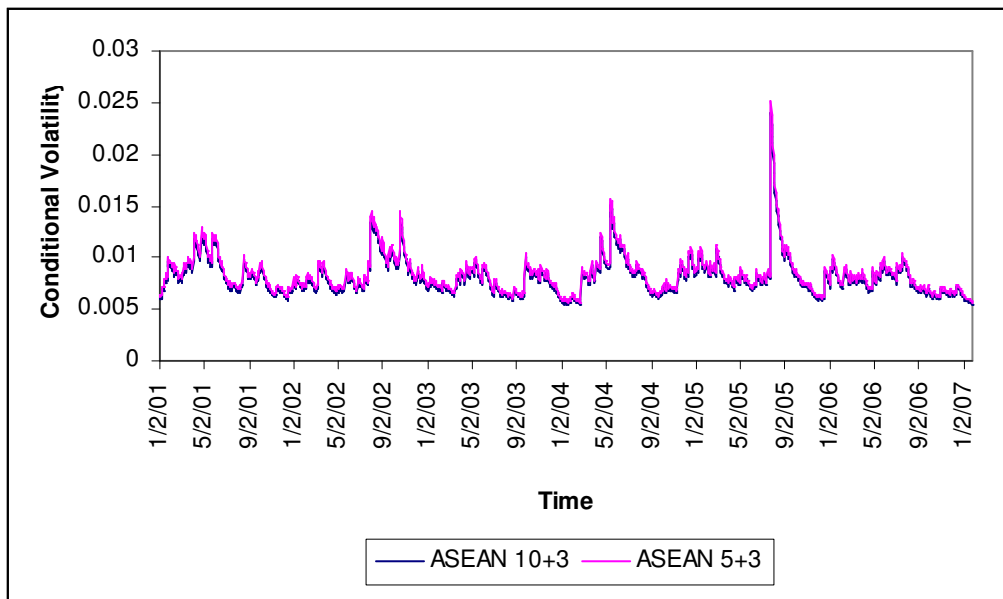
$$V(\varepsilon_t : \Omega_{t-1}) = \sigma_t^2 = w + \sum_{i=1}^q \alpha_i \varepsilon_{t-i}^2 + \sum_{j=1}^p \phi_j \sigma_{t-j}^2$$

	ASEAN 10 + 3	ASEAN 5 + 3
W	0.0003 (2.491)**	0.0004 (2.501)**
α	0.0302 (3.498)***	0.0315 (3.610)***
ϕ	0.9319 (42.71)***	0.9260 (43.69)***
$\alpha + \phi$	0.9621	0.9575
Unconditional Variance	0.008105	0.008471
Ljung Box (12) for the Levels	18.346 [0.105]	10.963 [0.532]
Ljung Box (12) for the Squares	8.324 [0.759]	1.254 [0.999]
Sign Bias	0.266 [0.915]	0.310 [0.930]
Negative Size Bias	-0.201 [-1.180]	0.009 [0.031]
Positive Size Bias	-0.051 [-0.235]	-0.093 [-0.355]
Joint Test	1.510 [0.679]	4.172 [0.243]

Notes: ***/** denote statistical significance at the 1% and 5% levels, respectively. The number in parentheses are the t -statistics. The numbers in square brackets are p-values.

The conditional variance using the GARCH(1,1) with normal distribution for two AMUs above is shown in Figure 4.8, in which the persistence in volatility is evident. As depicted in this figure, both AMUs demonstrate similar pattern of volatility and volatility is persistent for short-horizon returns but not for long horizon returns of AMU.

Figure 4.8: Conditional Variance based on GARCH(1,1) of AMUs



Robustness Check Using Different GARCH with Different Distribution

The empirical results above are based on the GARCH(1,1) specification with normal error distribution. In order to verify the robustness of the estimation, we repeat the similar process but estimating the GARCH model with generalized error distribution and student's t distribution. The empirical results are reported in Table 4.6. Again, the unconditional variance results are similar to those reported in Table 4.5, where the AMU which is composed of ASEAN 5 + 3 is higher than ASEAN 10 + 3.

Table 4.6: Unconditional Variance of GARCH(1,1) Estimation with Different Distribution

	ASEAN 10 + 3	ASEAN 5 + 3
Generalized error distribution (GED)	0.007998	0.008358
Student's <i>t</i> distribution	0.008040	0.008410

Test for Equality of Variance between AMUs: ASEAN 10 + 3 and ASEAN 5 + 3

Even though the empirical results of unconditional variance reported in Tables 4.5 and 4.6 demonstrate that the volatility of AMU that composed of ASEAN 5 + 3 is greater than ASEAN 10 + 3, various battery of variance equality tests are employed to verify that these two AMUs have different variances using the AMU series in Figure 4.5. These tests involve a different approach to the CUSUM-type tests in that they test for the homogeneity of variances of distinct samples (in our case these samples are two different AMUs) without considering the time series dimension of the data. They include the standard F-test, the Siegel-Tukey test with continuity correction (Siegel and Tukey, 1960, and Sheskin, 1997), the adjusted Bartlett test (see Sokal and Rohlf, 1995, and Judge et al. 1985), and the Levene test (1960)⁹.

The F-test requires equal sample sizes and is sensitive to departures from normality. This is not the case for the Siegel-Tukey test, which however assumes that the samples are independent and have equal median. The Bartlett test is also robust when the sample sizes are not equal, however, it is still sensitive to departures from normality. Its adjusted version considers a correction factor for the critical values and the arcsine-square root transformation of the data in order to conform with the normality assumption. The Levene test is an alternative to the Bartlett test and is less sensitive than the Bartlett test to departures from normality.

Table 4.7 reports the variance equality results outlined in the above. These tests reveal that the variances between AMUs, which composed of ASEAN 10 + 3 and ASEAN 5 + 3 are not statistically significant, where three of the tests, namely F-statistic, Bartlett and Levene tests suggest no different variances. On the other hand, the Siegel-Tukey test reveals that the null hypothesis of variance equality is rejected at 1% level. This implies that the variances between both AMUs are different. However, since we select the one suggested by most criteria to test the variance equality, we conclude that there is no difference between the variances of AMUs that composed of ASEAN 10 + 3 and ASEAN 5 + 3.

⁹ These tests are calculated in Eviews.

Table 4.7: Test for Equality of Variances between ASEAN 10+3 and ASEAN 5+3

Method	Test-statistic	Different in Variance
F-statistic	1.01	No
Siegel-Tukey	3.75***	Yes
Bartlett	0.11	No
Levene	0.26	No

Note: *** denotes statistical significance at 1% level.

4.5 The Volatility Behaviour of East Asian Currency in terms of the AMU and US\$

This section compares the volatility behaviour of East Asian currency in terms of the AMU and US dollar bilateral rates. Again, the GARCH(1,1) with normal distribution and generalized error distribution model are fitted to the compounded returns of each East Asian currency. The empirical results of unconditional variance are reported in Table 4.8. As shown in this table, among the currencies in East Asia, Indonesia, South Korea and the Philippines have the highest volatility (see Figure 4.9). This finding is consistent with Ogawa and Shimizu (2005), who finds that the nominal AMU deviation indicators of these three countries have fluctuated widely and frequently from the benchmark rate in terms of the AMU.

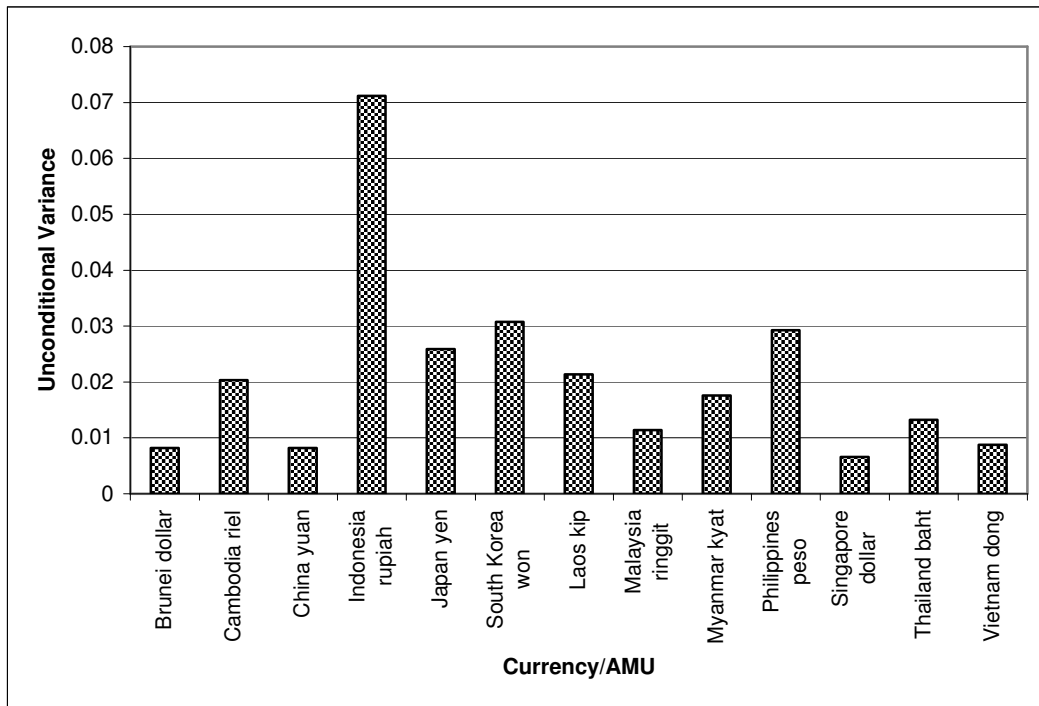
Table 4.8: Unconditional Variance of East Asian Currency in terms of the AMU

No.	Currency/AMU	Normal distribution	Generalized error distribution
1	Brunei dollar	0.008218	0.008175
2	Cambodia riel	0.027999	0.020330
3	Chinese yuan	0.008128	0.008214
4	Indonesian rupiah	0.178000	0.071183
5	Japanese yen	0.023961	0.023906
6	South Korean won	0.032050	0.030776
7	Laos kip	0.025822	0.021379
8	Malaysian ringgit	0.011819	0.011392
9	Myanmar kyat	0.030197	0.017582
10	Philippine peso	0.048968	0.029264
11	Singapore dollar	0.006545	0.006576
12	Thai baht	0.015759	0.013233
13	Vietnamese dong	0.008802	0.008744

The high volatility of the Indonesia rupiah had been primarily attributable to the prolonged after effects of 1997-98 East Asia financial and currency crisis. The rupiah appreciate substantially when the financial crisis finally began to fade in more recent years. Nevertheless, the currency has once again come under downward pressure due to the concern about Indonesia's macroeconomic outlook. With respect to the South Korean won, several

scholars have pointed out that the monetary authorities in South Korea ceased to intervene in foreign exchange markets recently and the won has since been subject to substantial volatility under the floating exchange rate system. Among the East Asian currencies, the Philippine peso is the only one that has continued to depreciate. Fiscal deficits and other economic outlook undermining confidence in the peso are causing it to continue to depreciate.

Figure 4.9: Unconditional Variance of East Asian Currency in terms of the AMU



GARCH(1,1) Estimation with Generalized Error Distribution

Table 4.9 presents the empirical results of unconditional variance of bilateral exchange rate vis-a-vis the US dollar. The results reveal that Indonesia rupiah, South Korean won and the Philippines peso have the highest volatility compared to other currencies (see Figure 4.10). This finding is similar to those reported of Table 4.8.

Table 4.9: Unconditional Variance of East Asian Currency in Terms of the US\$

No.	Currency/US\$	Normal distribution	Generalized error distribution
1	Chinese yuan	0.010237	0.011412
2	Indonesian rupiah	0.188898	0.137218
3	Japanese yen	0.062204	0.042719
4	South Korean won	0.038709	0.058096
5	Malaysian ringgit	0.023310	0.021404
6	Philippine peso	0.056183	0.053926
7	Singapore dollar	0.014837	0.014569
8	Thai baht	0.028874	0.024798

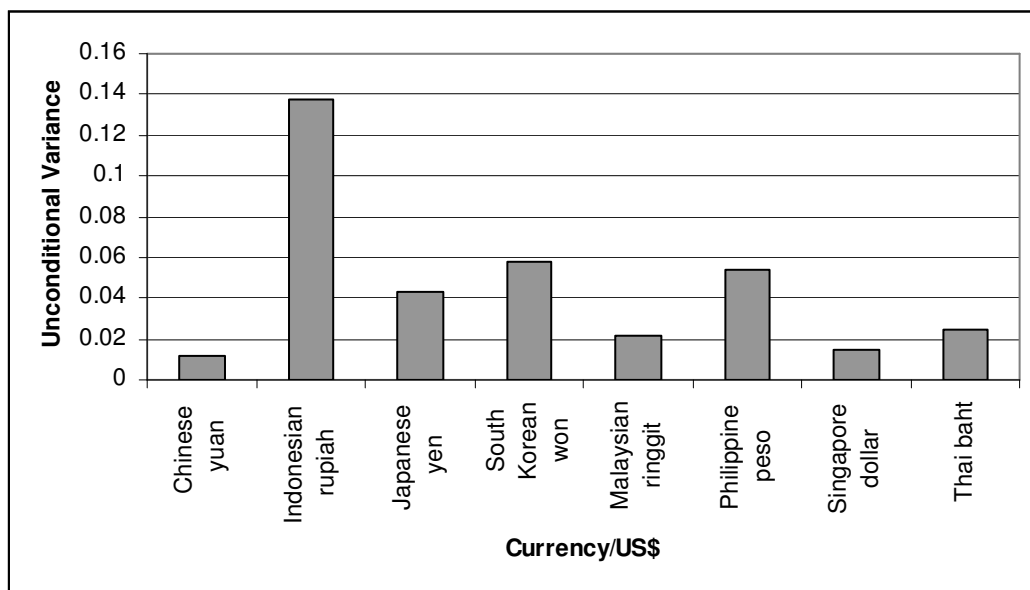


Figure 4.10: Unconditional Variance of East Asian Currency in terms of the US\$

GARCH(1,1) Estimation with Generalized Error Distribution

Volatility Behaviour between AMU and Exchange Rate vis-à-vis the US\$

This section present the performance of AMU and US\$ in terms of volatility behaviour of ASEAN 5 + 3. Figure 4.11 shows the unconditional volatility of ASEAN + 3 currencies in terms of AMU and US dollar, based on the GARCH(1,1) estimation with generalized error distribution. The diagram demonstrates that the variability in terms of US dollar is higher that AMU for all currencies.

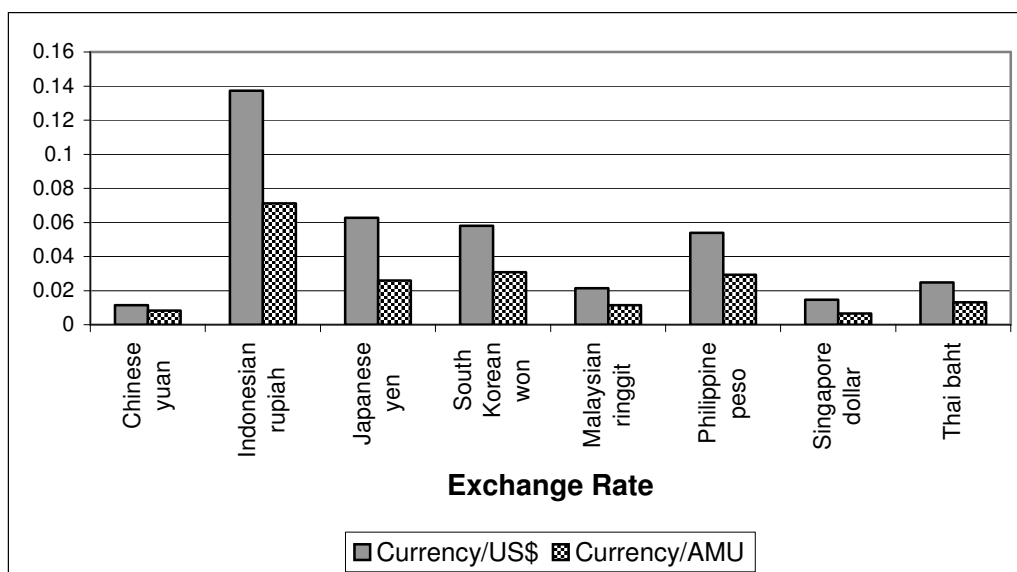


Figure 4.11: Unconditional Variance of East Asia Currency in terms of AMU and US\$

GARCH(1,1) Estimation with Generalized Error Distribution

Table 4.10 presents the variance inequality tests between the ASEAN 5 + 3 currencies in terms of AMU and US dollar. The empirical results indicate that the null hypothesis of variance equality is rejected using all tests for all currencies. This implies that both currencies in terms of AMU and US dollar indeed have different variances. This finding is in line with the diagram illustrated in Figure 4.11, where the unconditional variance in terms of US dollar is higher than AMU.

Table 4.10: Test for Equality of Variances between Currency/AMU and Currency/US\$

	F-statistic	Siegel-Tukey	Bartlett	Levene	Different in Variance
Chinese Yuan	2.88***	2.16**	425.3***	365.3***	Yes
Indonesian rupiah	54.65***	30.25***	367.4***	323.2***	Yes
Japanese Yen	2.37***	16.05***	286.7***	236.9***	Yes
South Korean won	2.03***	18.11***	193.3***	268.6***	Yes
Malaysian ringgit	2.85***	0.44	416.6***	562.4***	Yes
Philippine Peso	26.89***	28.53***	312.54***	248.96***	Yes
Singapore Dollar	7.21***	27.90***	1343.1***	1262.3***	Yes
Thai baht	4.02***	22.26***	709.5***	706.4***	Yes

Note: Significance levels are denoted as follow: *** (1%) and ** (5%).

Conclusion

This section examines the behaviour of the ASEAN 10 + 3 and ASEAN 5 + 3 currencies as the component of the AMU. The empirical results using the GARCH (1,1) model demonstrate that the unconditional volatility of AMU that consists of ASEAN 5 + 3 appears to be slightly higher than ASEAN 10 + 3. However, the difference between the mean of the conditional variance is statistically insignificant at 1 percent. This is not surprising given that the size of the weight attached to the transition economies of Vietnam, Laos, Cambodia and Myanmar. The volatility in terms of each currency of East Asian countries reveals that Indonesia, South Korea and the Philippines have the highest volatility. The finding is robust to two currencies, namely in terms of AMU and US dollar. Finally, the empirical results also indicate that the volatility of currency in terms of AMU is lower than US dollar for all currencies in ASEAN 5 + 3. Thus, the AMU has a potential tool of surveillance process in the foreign exchange markets, which will lead to stability of the effective exchange rates of Asian currencies.

Finally, giving up national currencies to create new common money (for surveillance or official transaction) such AMU will lead to a less instable exchange rate risk (volatility) in the region and hence it can be welfare enhancing as such a move will increase foreign trade and investments. Of course, this argument is based on the assumption that such a move will have little impact on the global exchange rate stability

5.0 Regional Monetary Units (rmu) as Official and Private Use: Lessons from the European Currency Units (ecu)

5.1 Business transactions in rmus

From the experience of the European Union (EU), when the European Currency Unit (ECU) was created in 1979 as part of the newly established European Monetary System, few observers predicted the success it would have in private market financial markets. Skepticism about the future of this new creature was widespread. The few who were optimistic about the ECU's future generally predicted its success to occur in a quite different area than in private markets. Optimists as a rule predicted the ECU to become an official reserves currency in Europe which would gradually replace the dollar, and which would be a vehicle of European policy making. However, after more than ten years of existence, the ECU has been a success in the private markets and in fact the ECU has evolved as an important financial instrument in the private markets.

For that matter, if we were to adopt the same *modus operandi* to the Asian Monetary Union (AMU, ASEAN+3), the Regional Monetary Unit (rmu) proposed by Ogawa and Shimizu (2005) would be a success story in the future. If one starts by asking the question why there should be investments in the rmu, a perfectly good answer is to say 'why not?'. People invest in coins and stamps, not to mention more exotic instruments such as old bottles and pottery. In some of those cases there is an element of trying to overcome the second law of thermodynamics by creating harmony out of chaos, and by capitalizing on the scarcity value of particular assets. But in the case of interest-bearing or income-bearing instruments, people buy farm-land, property, and various exotic financial assets. What then is so repulsive about the rmu that it should not be one of the acceptable investment assets? As a matter of fact, any investment asset should be acceptable to a rational investor provided that it provides an adequate risk-adjusted rate of return.

If rmu were to be adopted, in future, this single currency will replace all existing national currencies in the AMU, including the Japanese yen, won, yuan, ringgit, rupiah, baht, Singapore dollar, Brunei dollar, pesos, etc. This process may take place gradually with just a number of currencies being converted into the rmu (see Step 1 below) or in one single transaction. Although the latter unlikely at this point the final result will be the same: all national AMU currencies will be abolished (see step 2 below). Therefore, a businessperson involved in dealings in any of the existing AMU currencies must prepare for their abolition and conversion into the rmu.¹⁰

The following is a very basic international business transaction. For the purposes of illustration, it is not an attempt to outline or consider all the details and angles even such a basic transaction may involve. Rather, it shows in a very fundamental manner why it is important for any business to prepare for the single AMU currency – and to prepare for it now. The business transaction involves parties in a number of countries. It shows to what degree everyday business is affected by foreign exchange transaction – and to what extent the conversion into the single AMU currency will positively change the complexity of such transaction and most importantly, translate into direct savings for transnational businesses.

¹⁰Discussion on this section is heavily adopted from Mehmet-Meland, 1994.

A. The Transaction

Supposing, a company in the United States is in the business of producing and selling lamps. The manufacturer purchases parts for the lamps in China, Philippine and in Vietnam. The lamps are assembled at the plant of the company's Malaysia subsidiary in Japan and sold in the stores in South Korea and Thailand. The company also receives Singaporean dollar and Indonesian rupiah for sales by its distributors in Singapore and Indonesia. The company has engaged an attorney in Cambodia on retainer. The accounting ledgers of the subsidiary are maintained in guilders. Profits are converted into US dollars and transferred to the United States at year end. Prior to the transfer, the subsidiary invests the profits in short-term CDs denominated in ruc and receives interest in ruc.

The following graphic shows the foreign exchange flows necessary as a result of the company's transactions.

B. The Status Quo

In the current system, a significant number of foreign exchange transactions must be undertaken by the company and its subsidiary to carry out the business described. In the above graphic, which only shows some of these transactions, the company would have to deal with 12 different currencies (see Figure 5.1).

The company would receive Korean won, Thai Bath, Singapore dollar and Indonesian rupiah for the sales of its products (local sales revenues minus expenses for its stores and its distributors.). On the other hand, it would need Chinese yuan, Vietnam dong and Philippine pesos for payment for the parts required for the product. It would also need Japanese yen for the costs related to the assembly (labor, lease payments, etc.), Cambodian riel for payment to its Cambodian attorney and Malaysian ringgit for its own operating costs. During the year, profits would be exchanged into ruc for short-term investment and, at the end of the year, into US dollars for transfer to the parent in the United States.

In addition to the costs resulting from the administration of the currency transfers, such transactions would be subject to negative exchange rate fluctuations, hedging costs and expenses in the form of banking charges and commissions. It would be very difficult for such a business to establish a reliable business plan. It would be almost impossible to determine the final profit margin because the costs of and revenues from goods would be subject to additional uncertain factors of fluctuation and costs.

In the above system, therefore, a significant cost factor must be included in any transaction involving more than one country in the AMU.

C. Step 1: The Interim System

If the AMU is in the process of establishing the ruc as its single currency which would replace existing national currencies, then, it cannot be expected that the national currencies will all be replaced at one certain date. Rather, it is very likely that the ruc will replace individual currencies on a step-by-step basis. Supposing that the AMU begin with ASEAN5+3, and in such a case, the foreign exchange flows in this transaction would change as follows (see Figure 5.2).

Essentially, the only transactions requiring currency exchanges (and the corresponding administrative, fluctuation and commission costs would be the sales receipts from Thailand and Indonesia, the payments to Vietnam and Cambodia and the transfer of profits into the United States. Of course, some transfers by the subsidiary into or from rmus may be required to balance payments and receipts in currencies other than the rmu.

D. Step 2: The Single AMU Currency

Following the introduction of the rmu as the single currency for all AMU Member States at some future date, the only exchange transaction required would be the transfer of the net profits of the company to its parent company in the United States. As shown in Figure 5.3, all other transactions would be denominated in rmus which would have replaced all national currencies.

5.2 Official uses of the rmus: Learning from the ecus

In the beginning, the EC explicitly restricted the entities permitted to use ecus to the national monetary authorities and the EC institution. In an effort to enhance the ecu, it expanded the number of entities empowered to use ecus in 1985. Non-EU monetary authorities and international monetary institutions may be granted the status of “Other Holder” and acquire, hold and use official ecus.

Despite the rapid growth of the private ecu markets, private parties such as commercial banks, financial institutions, individuals and corporations cannot use official ecus. That use is limited to the entities granted the special “Other-Holder” – status. Private parties only can use private ecu which is created by the commercial banks. As long as permission to use official ecus is not granted to those private parties, there will be a difference between the official and the private ecu. A link between these two would change the role of the ecu from a unit of account for private parties to a legally accepted unit for transactions: an official currency. As an economic reality, those private parties use the privately-created ecu to a degree which over shadows its official uses (a distinction which of course, will disappear with the transformation into the single EU currency).

The initial functions of the ecu are part of its role in the EMS. It is the means of settlement for the EU monetary authorities. It is the denominator for the ERM and for operations under the EMS credit mechanisms. It serves as the basis for the divergence indicator. The ecu still performs these functions. However, additional official uses have developed within the EU and now comprise:

- a) Use as a reserve currency;
- b) Use as a means of payment and settlement;
- c) Use in the EU budgets, for EU grants, loans and fines, for services and for the salaries of EU officials;
- d) Use for statistical purposes;
- e) Use in the common agricultural policy;
- f) Use by the European Investment Bank;
- g) Use in the European Development Fund; and
- h) Use as denominator for customs duties.

5.3 Private uses of the rmus: Learning from the ecus

One of the most promising developments in the monetary field has been the acceptance of the ecu as denominator for private and commercial financing instruments on the international markets. This acceptance is completely independent from the official use of the ecu by monetary institutions. Although initially only contemplated as a denominator and a means of settlement for the EC authorities, the volume of the private ecu markets is now estimated at between ECU 200 and 300 billion.

This development of the private ecu is important for entities involved in business with the EU. Except for some limited instances, a business will probably not encounter the official ecu in daily transactions. The use of official ecus is limited to exposure in transactions which are funded by the EU. The exposure to private ecus, however, may have significantly larger proportions. As will be shown in this and following parts of *Ecu in Business*, the ecu has developed into an internationally accepted currency.

The private market for the ecu became possible in the early 1980s with ecu accounts opened by certain Belgian banks for EC institutions. These accounts facilitated the cash management of the latter and transfer to the European Investment Bank (EIB). The EIB in turn, deposited the received and unused ecu assets with Italian banks. The Belgian and Italian banks, however, wanted to use those deposits for which interest accrued and created an ecu loan and foreign exchange market by granting ecu credits to a limited number of private customers. The customers used the ecu credits and “unbundled” the ecus received by breaking them down into their component national currencies. Similarly, private parties “created” their own ecus by buying and “bundling” the appropriate amounts of the component currencies. The banks also accepted these ecus as deposits. This process of using ecus in private transactions and the establishment of the Ecu Clearing system in 1986 increased the number of individual participants as well as the variety of ecu-denominated banking services. The development from a one-way deposit to a two-way deposit and loan markets took place entirely within the private banking system. There is no central supervising authority and the private ecu market is marginally regulated by national central bank regulations.

There are a number of reasons which explain the favorable development of the ecu despite the lack of official sanctioning. First, the ecu has a very stable exchange rate toward third currencies. Second, the interest rates for ecus instruments are between the high rates of “soft” EMS currencies and the lower rates of “hard” EMS currencies. Third, as a result of the non-existence of a central monetary authority, there are only a few regulations for the private and commercial uses. The individual central banks established a very basic legal and institutional framework which has made the ecu an attractive investment vehicle. Fourth, individual commercial banks promote the ecu as a means of investment and transfer to their customers. Being relatively independent from national monetary regulations, the ecu has an inherent flexibility which allows monetary institutions to virtually “custom-tailor” to customer needs. Furthermore, the lack of an established home market for ecu products and the resulting relative equality of the banks across the EU enable them to establish their respective clientele and specialization without regard to inherent competitive advantages of the banks in a particular country. Fifth, the use of the ecu by corporations with locations in several EU countries decreases risk exposure and administrative costs for foreign currency management.

5.3.1 How to use private ecus

The most significant restriction to the private use of ecus results from the fact that the ecu still is a foreign currency in all EU Member States. As such, it is subject to considerable commission fees and spreads which are payable to banks upon conversion into out of the ecu. These additional expenses have made it quite costly for business to fully use the ecu in their transactions.

This restriction will lose its impacts with the transformation of the ecu into the single EU currency. At that point, most of the remaining currencies will disappear and the ecu will become the single legal tender. It then will enjoy the same domestic status in the EU as the dollar enjoys in the United States. By default, its private and commercial uses will increase dramatically. An increased use in most areas should be expected even before the 1997 or 1999 deadlines set for the creation of the single EU currency. As the ecu is the candidate for that position, private parties might begin to start using the ecu in their daily transactions to prepare for the ultimate transformation. That development, however, is entirely in the hands of the private markets and can only be supported and facilitated, but not demanded, by the EU or national authorities. Therefore, at present, the ecu has a significant status only in a number of areas while it is limited in others.

A. Bond and Money Markets

In its private and commercial uses, the ecu has been most successful in the bond markets, including government issues of ecu instruments, and the money market.

Ecu bonds have secured themselves a significant share in the markets for Eurobonds and international bond issues. In 1991, the ecu was the third most used denomination on the international bond markets with three main categories: (i) strictly domestic government bond issues; (ii) domestic/international government bond issues; and (iii) purely international bond issues in the Euromarkets.

The ecu money market for bank liabilities, medium term, certificates of deposit, commercial papers, United Kingdom Treasury bills and Italian BTEs, has been the single fastest growing segment of the ecu markets with a total market volume of over ECU 140 billion.

2. Types of Ecu Bonds

The Ecu bond market offers most of the bond types available in traditional bond markets. They include Fixed rate Bonds, Adjustable rate bonds, Zero Coupon Bonds, Partly paid Bonds, Floating rate notes (FRN), Convertible bonds, Cum Warrant Bonds, Currency Warrant and Convertible Ecu Bonds and German "Schuldscheine". One type of bond unique to the ecu is Titres Participatifs in which a portion of the yield is linked to the profit of the issuing entity.

3. The Government Debt Market

Traditionally, the ecu market was split equally between issues by corporations and issues by government entities. The latter include national and local governments, supranational institutions and government enterprises. The ecu bond market has change significant during the past two years. Issues by government entities now represent approximately 75 percent of

the primary market in ecu bonds. Sovereign governments have found the ecu market especially attractive because of the often lower interest rate compare to their national currencies. The increase in sovereign issues also significantly increased the average size of new ecu bonds.

4. Swaps

The ecu financial markets are characterized by a significant volume of swap transactions. The increase in volume of ecu swaps is attributed to the significant growth of the ecu bond market. Issuers of ecu bonds, especially large corporations, which have no ultimate use for the ecus raised by the issue swap them for other currencies. Other issuers profit from the spreads between the yields available in the different currencies or on the basis of favorable exchange rate expectations. On the secondary markets, swaps provide efficient risk management of foreign currency positions because of the more advantageous exchange rate risk at conversion.

The majority of swaps involving ecu bonds are cross-currency swaps in which the parties exchange interest and capital payments in different currencies. Counter-currencies for ecu swaps include the US and Canadian dollars, Swiss and French francs and the German mark. A minority of swaps are based on different interest rate. They are usually cross-currency fixed or to floating interest rate swaps. On the bond market, swaps are used to arbitrage the competitive advantages of the parties in their respective home markets. Ecu swap issues are often advantages to non-European borrower as they do not required rating as high as normal on the Eurobond rating market.

5. The Ecu Money Market

The ecu money market for bank liabilities, medium-term notes, certificates of deposit and commercial papers (including United Kingdom treasury bills and Italian BTEs) has been the faster growing segment of the ecu market. This increase results from the stability of the ecu which has rendered it a preferred currencies for entities interested in stable denominators to decrease foreign exchange risks, from the substantially increased number of jumbo-issues of ecu money market instruments by national government, namely the united kingdom and Italy, and from the fresh political support for the EMU and the transformation of the ecu into the single EU currency.

Despite the significant growth of the ecu in the money markets, there have been two substantial obstacles to the further development of these products. First, the lack of demand for ecu assets from corporations – which generally have no ultimate use for the ecu in cash management, as means of payment or commercial settlements currency at this time – has limited the access to ecu money markets to financial institutions and governments. In addition, almost all corporations which borrow in ecus still swap the ecus received into their national currencies and do not deposit these ecus in the banking systems to “use” them in their transactions. Second, there is no thoroughly developed liquid secondary market for the British and Italian money market instruments. Most of the trade takes place on the primary markets among the market-makers. The non-accessibility of these instruments through the secondary markets has turned into a major obstacle for the ecu in this segment.

B. Private non-Bond Markets

1. Loans

The market for ecu loans grew steadily between 1981 and 1992. It was, however, also negatively affected by the Currency Crises. Private parties, as well as the governments of some EU Member States, such as France and local government use these syndicated ecu loans in amounts between ECU 10 and 450 million and with maturities between 1.5 and 10 years. Typical amounts are between ECU 10 and 150 million with maturities from five to eight years. Interest rates are expressed as spreads and vary in accordance to EIBOR, PIBOR or LIBOR rates (Ecu, Paris or London Interbank Offered Rates).

Ecu loans are available in a number of different types. They range from Euroloans to revolving credit lines and term loans. The funds for *Euroloans* were historically raised entirely outside of the country of the debtor. These loans now also include internationally syndicated loans. *Ecu Commercial Papers* are ecu "promissory notes" usually issued at discount. *Revolving lines of credit* are loan facilities enabling the borrower to use a loan in full or in a part up to a maximum amount during the lifetime of the credit arrangement. *Term loans*, on the other hand, are paid out in full and are repaid in full or in schedule installments. *Credit lines* for suppliers and exporters and *multiple loan facilities* typically are comprised of a revolving credit line which can be used in various ways, including bankers' acceptances or cash advances. Some ecu loans are part of multi-currency loan facilities in which other currencies also are utilized.

2. Futures and Options

The development and introduction of ecu futures and options soon followed the issues of the first ecu bonds and loans in the early 1980s. Seven major exchanges in Europe and the United States have offered or are currently offering ecu futures and options. The European Options Exchange (EOE) in Amsterdam launched the first option on the ecu in 1985. the new York cotton Exchange (NYCE), the Philadelphia board of trade (PBOT) and the Chicago mercantile exchange (CME) introduce ecu futures and the Philadelphia Stock exchange (PHLX) introduce ecu options in 1986 the London international financial futures exchange (LIFFE) has offered a three-month interest rate futures contract denominated in ecu since 1989 and an ecu bond futures contract since 1991. The Marche a Terms des Instruments Financiers (MATIF) in Paris introduced a 10-year ecu-futures contract in 1990. In addition, the Chicago Board of Trade (CBOT) obtained government approval for a three-month ecu interbank interest rate contract in 1991. This contract has not yet been launched.

3. Ecu Foreign Exchange Markets

The ecu is officially quoted on the exchange markets in almost all EU Member States including quotation without official rates in London and Dublin. Trading in spot and forward ecu is concentrated in Paris, Brussels, London and Luxembourg. The ecu, like the British pound, is expressed in term of US dollars per ecu and not in terms of ecus per US dollar.

On the spot markets, the majority of ecu transactions involve the German mark and the US dollar as counter-currencies. The central banks of the EU Member States, the EU institutions and the European investment bank are the most active entities on this market. The underlying transactions include interventions by the central banks (as most EMS interventions are undertaken in marks and dollars) and the management and diversification of the currency portfolios of the central banks. The predominant position of the official institutions on this

markets is based on the fact that only very few private parties can use ecu in their daily transactions. For example, only very few corporations use the ecu as denominator for payments or other business transactions. Therefore, those entities will not require to trade ecus for their national currencies to make certain payments. A Belgian importer, for example, who negotiates with an American exporter to pay the price for the goods imported in US dollars, would have to exchange its Belgian francs into dollars at the foreign exchange markets to effectuate the payment. As only few corporations invoice in ecu at this time, such conversion is not necessary with regard to the ecu. With the transformation of the ecu into the single EU currency and the increasing use of ecus in commercial transactions which will require the exchange of national currencies into ecus, the ecu foreign exchange markets should experience a dramatic increase in users and volume.

The forward ecu exchange market is concentrated in Brussels, Paris, Dublin, Stockholm, New York and London. The volume on this market is still very limited. The trade focuses almost exclusively on exchanges of ecu for US dollars. Generally, the transactions are in amounts of over ECU 25 million with maturities of up to six months.

The ecu spot and forward exchange markets are important for the development of the private ecu. They provide instant "cash" ecus to central banks and other institutions. However, only with the increased use of commercial ecus at or possibly before the final transformation of the ecu in the single EU currency, will this market gain importance for corporations and eventually rival that of the dollar. At present, the spot and foreign exchange markets account only for about one percent of global foreign exchange transaction and are only accessible to large corporations and public entities with the need for significant amounts of ecus. Smaller entities cannot fully utilize spot and forward transactions because of the adverse structure of the markets and the fact that those entities often do not even required spot and forward ecus for their normal business transactions.

4. Ecu Investment Funds

The ecu is a very advantageous currency for investors, private or institutional, who are looking for a safe investment in a foreign currency with stable exchange rates. As outlined, the ecu has both of those characteristics as a results of its nature as a basket currency and the quantity of the issuer of ecu bonds and similar instruments. Investors who are interested in investing in a wide array of ecu instruments use ecu-denominated investment funds. The increasing demand prompted large commercial banks in Europe and the United states to create a sizeable number of such funds with portfolios consisting partially or entirely of ecu bonds, money market and other financial instruments in their branches in Luxembourg, France and the Channel Islands. The funds are generally divided into four classes according to their investment:

- a) Funds composed of instruments denominated in ecus or its component currencies;
- b) General funds without specialized focus an ecu instruments which invest partly in ecus;
- c) General funds without specialized focus on ecu instruments which are denominated in ecus; and
- d) Umbrella funds which include ecu funds.

Like investment funds in other currencies, ecu fund provide significant risk, management opportunities through the wide range of their investments. Ecu funds are particularly

interesting for investors in foreign currency funds because they are not subject to significant exchange rate losses. In addition, the generally favorable ecu interest rates permit investment in competitively priced low-risk instruments.

6. Other Private Ecu Uses

The ecu has made other inroads into the lives of EU citizens. Private ecu services offered by growing number of financial institutions comprise traveler's checks, credit cards, mortgages and sight, time and savings accounts. The ecu is particularly advantageous for the private customer. The alternative, known in its full extent to every traveler in Europe, is a colorful but confusing assortment of traveler's checks and banknotes in at least a dozen denominations and the corresponding transaction costs.

A number of European banks now offer sight accounts and savings accounts in ecus. Although the volume of ecu accounts is still rather small, the transformation of ecu into the single EU currency, by definition, will dramatically increase the number of banks offering such accounts and, of course, the number of users. In essence, all accounts currently denominated in a national currency in the EU which will be abolished and substituted by the ecu will have to be changed into ecu accounts. Ultimately, all accounts for the 340+ million citizens and all EU business will be in ecus.

8. The Ecu Clearing System

The Ecu Clearing System has been an extremely important factor in the development of the private ecu. This highly advanced system represents the technical side of ecu transactions as it provides a settlement mechanism for ecu payments and transactions. As more ecu-denominated products become available, more payments are being made in ecus between private parties. These parties approach their respective financial institutions and request the making or receiving of ecu payments. In order to facilitate the multitude of such incoming and outgoing transactions, a number of banks established the Ecu Clearing System as their interbank payments and settlement system.

The Ecu Clearing System has been instrumental in the development of the private and commercial ecu markets. It is a multilateral clearing system for transactions in private ecu among commercial clearing banks inside and outside the EU, the Bank for International Settlements (BIS) and the Society for Worldwide International Financial Telecommunications (SWIFT).

C. Commercial Uses

Another area with potential for significant uses for private ecus are commercial transactions, such as payments, invoicing, accounting and other transactions by businesses. Despite some initial interest in the ecu as a commercial currency, its development in commercial transactions did not parallel the growth of the other private ecu markets.

1. Obstacles

There are a number of reasons for this development. Most importantly, the lack of private end-users of ecus which resulted from its non-legal tender status has prevented the ecu from becoming a credible means of payments and transactions for most corporations. The lack of a

central bank responsible for the ecu and the sometimes negative attitude of some authorities in the EU Member States toward the ecu as a fully fledged currency also hindered some potential commercial users from introducing it in their transactions. In addition, the initial characteristics of the ecu market for financial instruments, namely the relative illiquidity and the non-completeness of the array of available financing instruments, stifled commercial uses. Other obstacles to the increased use of the ecu particularly in the commercial area are the lack of a definite legal basis for ecu-denominated bills of exchange and the fact that most Member States do not permit reporting in ecus parallel to the national currency. As an incentive for the use of ecus by corporations, the 1990 EC Council directive on annual accounts permits small and medium-sized businesses in the EU to publish their accounts in ecus.

In addition, corporation usually cannot pay taxes in ecus or have their tax liabilities assessed in ecus. Another significant obstacle to the commercial use of the ecu is the inability of corporations to have their Value Added Tax liability assessed and denominated in ecus. This means that a corporation which potentially is interested in using ecus for its transactions with other entities would be required to translate the ecus received into the national currency in order to pay its VAT liability to its government. It would be easier for such corporations to transact its business in the national currency to avoid this conversation and the related administrative expenses.

2. Commercial Uses

The following discussion of potential ecu uses for commercial purposes must be evaluated in light of the fact that the ecu will become the single EU currency as early as 1997. With this transformation and the concurrent abolition of existing national currencies, the discussion of whether and how the ecu is an advantageous currency for commercial purpose will be meaningless. At that time, there will be no alternative for EU entities than to use the ecu for all commercial purposes unless they decide to use not-yet-abolished or non-EU currencies. The discussion below, however, is important for business interested in introducing the ecu for commercial purpose before the transformation date. The ecu will very likely gain much importance and volume over the years leading to the transformation as it will not simply turn into an important currency on the eve of its transformation. Businesses, therefore, are well advised to introduce and utilize ecus for commercial uses as soon as possible and not to wait until that magic date.

For a commercial user, the ecu essentially has two major advantages: (i) the decrease of exchange and interest rate related risks, and (ii) the reduction of transaction costs. The more important of the two is the foreign exchange stability of the ecu. Its basket composition reduces exchange and interest rate variations. This reduction decreases the loss exposure for a commercial user. Compared to the volatility of major world currencies, namely the dollar and the yen, the ecu is a stable and less risky currency for investment and business transactions.

The second significant potential benefit related to the simplification of exchange transactions and the corresponding decrease in administrative costs. Generally speaking, any company that transacts business outside its home country will be required to deal in different currencies. A company transacting business in all EU Member States, for example, will have to buy and sell 12 different currencies to effect all of its transactions. This results in administrative costs, costs from the exposure to exchange rate related risks, expenses in the form of commissions and fees, opportunity costs and complicated pricing policies, cash and

currency management. The out-of-pocket expenses for the conversion of EU currencies and the necessary hedging transactions are substantial for multinational corporations. They include financial costs in the form of bid/ask spreads and banking fees. In addition, the need to employ more individuals to supervise multi-currency transactions and other opportunity costs impose extra expenses on corporations. By definition, the introduction of the ecu as the single EU currency and the abolition of the underlying national currencies will result in substantial savings and a significant facilitation of corporate finance. These costs, of course, are also income for other businesses, namely the financial industry. For those, the introduction of the single EU currency will result in substantial losses in revenues.

In addition to the internal and cost-saving advantages, the commercial ecu can be a very important currency for the external relations of a corporation. Not only is the ecu a stable currency but it is also a neutral currency because it has no home market or supervising monetary authority. These characteristics might give the ecu certain advantages as a currency for import and export businesses. Exporters, who would prefer the denomination of their outstanding accounts in a strong currency, and importers, who would benefit from a weak currency, can use the ecu as a compromise currency provided, of course, that they are in a position to negotiate such ecu payments or receipts. The ecu thereby provides a more equal distribution of exchange and interest rate risks. The neutrality factor, on the other hand, is important for foreign partners to a business transaction who might shy away from using a particularly national currency, in which case, for psychological reasons, the ecu might be a very attractive alternative.

Corporations can already use the ecu as a book denominator for internal and external invoicing, export and corporate financing and for accounting purposes. Companies with subsidiaries and business transactions in various European countries can introduce ecu-based internal invoicing systems which could simplify the maintenance of “scales of charges” for transaction between subsidiaries branches, the corporation and customers. It would be unnecessary, for example, to denominate the prices and charges in the individual currencies of the countries in which the subsidiaries, branches, the parent or the customers are located. Every transaction, price or charge would be no need for currency conversions until the balancing of the accounts and the final conversion of the balances into a national currency. As are results of the relative stability of the ecu, the ecu scales would not be subject to frequent adjustments. If the scales were based on the Deutsche mark or French franc, for example, revisions would be necessary with every appreciation and depreciation of the currencies against each other. Similarly, the use of ecu for accounting purpose would facilitate the accounting and decrease administrative costs for multinational corporations.

Export financing is generally cheaper in ecus than in other “hard” currencies. This has increased the share of the ecu in the foreign trade between Italy, France, the United States, Germany, Sweden, and some central and eastern European countries. The ecu, for example, is included as export credit agreement currency of the organization for Economic Cooperation and Development (OECD).

A third area of commercial use is for treasury management for which the combining of ecu assets and liabilities results in more stability and predictability in general. The availability of ecu future and option make of ecu an effective hedge against other currencies. Corporate treasurers can also use the ecu as a means of portfolio investment and diversification. This use has increase as a result of the more liquid market in ecu-denominated financial instruments. Ecu deposit and current accounts help corporate treasure with the management

of their cash reserves. A small number of corporations now denominated their balance sheets in ecus and their national currencies. The ecu thereby is used as an international reference currency which allows direct comparisons between the balance sheets of different companies or their subsidiaries. The use of the ecu as *sole* denominator for balance sheets of EU corporations, however, is limited because the ecu usually does not have the appropriate legal status in the EU Member States.

Although corporations interested in ecu financing generally use ecu loans and bonds, another way to raise funds is through ecu shares. To date, such shares are available only at the Luxembourg Stock Exchange. The issuance of ecu shares allows investors from all Member States to invest in companies without subjecting themselves to exchange rate fluctuations or transaction costs and provides corporations with a much broader market for capitalization purposes. It would, of course, subject the investor to the costs of converting the share-investment back into the investor's currency at the termination of the investment. Proposals have been introduced for the issuance of "European Depository Receipts", similar to the American Depository Receipts, for which the shares of European companies would be deposited with banks and then re-issued in ecu denomination.

Despite the general limitations, few entities have already used the ecu as denominator for commercial applications. Over 40 leading companies in Europe, for example, now publish their corporate accounts in parallel to their national currencies. The primary example is the French Saint Gobain conglomerate which has used ecu for intra-group accounting, transfers and payments since 1980.

D. International Institutions

As the ecu has developed into a currency for private parties and sovereign government, a number of international institutions also adopted or accepted it as a currency for certain purposes. To a large degree, such acceptance results from the significantly increased use of ecus in some markets, namely the bond market. This increased the instances in which such situations were confronted with ecus for financing or payment purposes. In addition, some of these institutions, namely the World Bank and the European Bank for Reconstruction and Development, have become significant participants in ecu financing and have used ecus for international debt issues.

5.3.2 Obstacles in the use private rmus: Lessons from ecus

A. General Overview

Generally speaking, there are the following two main categories of obstacles to the use of private ecus in the EU Member States:

1. Obstacles related to the currency nature of the ecu and international currency rules; and
2. Obstacles related to laws, rules, regulations, case-law or national practice in areas other than the monetary rules and applications.

1. Monetary Obstacles

Legal Tender Status

These obstacles are the result of the fact that no sovereign state issues ecus as its currency and that, therefore, no Member State regards the ecu as its legal tender. The various issuances of ecu gold and silver coins by some Member State since 1987 are only legal tender for tax reasons. They should not be considered true legal tender as they were merely issued for collectors.

As only money issued by a sovereign state is legally regarded as currency, the ecu technically is a non-currency. Most the Member States have circumvented this problem by granting the ecu the status of a foreign currency. Problems have arisen in the United Kingdom and Germany where foreign currency status was not granted and the ecu is regarded as a unit of account and not as a foreign currency.

The following examples outline the resulting problems in the United Kingdom and Germany. In the United Kingdom, where the legislation relating to the use of foreign currency is probably the most permissive in Europe, companies may issue their capital in foreign currencies and have their shares quoted on the stock exchange. The corresponding permission is granted by the Register of Companies which may include companies whose accounts are drawn up in a *currency issued and used as legal tender* anywhere in the world. As the ecu does not have legal tender status in any country, it is impossible for a company to be registered in ecus. A similar problem arises in Germany, where an even wider range of uses of the ecu is affected because the ecu is legally considered to be a unit of account. A decision by the Bundestag is necessary to grant the ecu foreign currency status.

Choice of Law Determination

According to the rules of the private international law on contracts, a court of law may determine which national law applies in the event the contract is silent on this issue. For example, in a contract signed in Spain between a German and an Italian to be executed in Belgium without a provision on the choice of law, the courts would need to determine on the basis of certain factors to which national law the contract was most closely related. Under the rules of private international law, one of the factors to be considered is the currency of contract selected by the parties. It is at least a secondary indicator of the willingness of the parties to submit the contract to the law of the country issuing the currency.

The ecu is an issued currency related to the legal order of a specific country and, therefore, cannot serve this purpose. The Member States should allow the ecu to be taken into account for decisions concerning contractual relation between EU and non-EU nationals.

Settlement Liabilities

At this time, the respective national currency is the only legal tender with unlimited applications for the settlement of liabilities in the respective Member States. Consequently, even if contracting parties agreed to payment in ecus, which would be legal in several Member States under applicable freedom of contract provisions, the

debtor could always insist on paying the legal currency of the place of payment and the creditor would not be able to refuse such payment.

This problem exists instances in which courts order payment in ecus. In addition, this legal obstacle also has a practical aspect. If the debtor agrees to pay in ecus, both debtor and creditor must maintain ecu accounts so that a bank transfer can be made without a foreign exchange transaction. A further problem arises if the debtor has no ecu assets to fulfill the court order. In such cases, the conversion date for the currencies becomes crucial element and subjects the creditor to potential fluctuations.

Problems also result from the fact that there is no complete structure of interest rates for a full set of maturities of ecu instruments to serve as a reference to the courts in their determination of default interest.

Other obstacles

In addition to the lack of foreign currency status in the United Kingdom and Germany, the legal and administrative obstacles to the use of ecu as a foreign currency are mainly the result of the remaining obstacles to the free movement of capital and financial services.

2. Obstacles Related to the National Legal Systems

There are a number of obstacles related to the resources of the governments and the incomes of the citizens of the EU. This applies to laws on contractual obligations, the establishment of businesses, stock exchange quotations, accounts, payments and taxation. In addition, some Member States permit the determination and display of prices only in their national currency to protect the consumers and their purchasing power.

Obligations and Monetary Instruments

There are other obstacles that prevent companies or individuals in some EU Member States from denominating, paying and enforcing their contractual undertakings and obligations in ecus. Such obstacles vary among the Member States in accordance with the national law of contract principles.

The use of the ecu to denominate transferable instruments (checks, promissory notes, bills of exchange, warrants, etc.) and financial instruments encounters different types of obstacles in Germany, Spain, Greece, Portugal and, to a lesser extent, Italy. In Germany, the obstacle is related to the status of the ecu which is not legally recognized as foreign currency. In Spain, Greece and Portugal, the problems result from existing obstacles to capital movements.

The use of the ecu as payment currency for negotiable instruments raises problems in Member States except those which have ratified the Geneva Convention of 1931 which provides a uniform law of checks, and the convention on bills of exchange and promissory notes, and have transposed them into their legal systems (namely Belgium, Ireland, Luxembourg, the Netherlands and France). The “effective payment” of negotiable instruments in a currency that is not legal tender at the place of payments requires the agreement of the parties in those Member States.

Banking Regulations

There are specific regulations in the banking sector to protect against the risk of bank insolvency. These regulations usually involve a requirement to establish reserves in an amount proportional to assets. The currency in which these reserves are denominated is a very important hedging factor against exchange risks. This is especially the case if banks carry out transactions in currencies other than national currency or – as increasingly the case – in ecus. In Denmark, France, Greece, Portugal and France, reserves must be denominated in the respective national currencies. This requirement penalizes transactions in foreign currencies, including the ecu, by rendering them more expensive.

Prices

In many EU Member States, the prices charged by shops and firms may not be set (Spain, Greece) or displayed (Greece, Netherlands) in ecus or any other foreign currency. This applicable laws or rules usually are long-standing and serve to ensure price transparency. In an environment in which tourism is highly developed and in which the free movement of persons, goods, services and capital is the rule rather than the exception, genuinely transparent prices could be achieved now by displaying prices in two currencies, ecus and the applicable national currency.

Accounting

Legal provisions governing contractual obligations are obstacles to the development of commercial transactions in ecus as a currency of accounting (Greece) or payment (Germany and Greece).

It is not sufficient to permit the denomination of contracts in ecus if, in cases of disputes, the courts are not permitted to enforce ecu clauses. In certain Member States, the courts may not render judgments in ecus (Italy and, unless certain conditions are fulfilled, or Greece) or enforce judgments denominated in ecus (Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands and the United Kingdom).

Commercial Uses

Company Capital. Only Belgium, France, Luxembourg, and with reservations, Ireland, authorize businesses to establish, issue or increase their capital in ecus. The Directive on the European Company provides that company capital will be constituted in ecus. However, this does not solve the problem for other types of corporate entities. Moreover, even in the Directive, the accounts of a European company would still be subject to national laws and would be denominated in the respective national currencies.

Quotation of Shares. Legal obstacles to the admission of shares in ecu-denomination to stock exchanges exist in Germany, Denmark, Italy, the Netherlands, Spain, Greece and, with certain reservations, France. There are obstacles relating to the quotation of such shares on stock exchanges in Germany, Spain and France. Except in Luxembourg, shares are always quoted in the national currency of the Member State in which the shares are quoted regardless of the original currency of denomination.

Company Accounts. Company accounts may be prepared and presented in ecus only in the United Kingdom and potentially in France. This is not permitted in Denmark. In Ireland, tax

procedures prevent the accounts from being published in Luxembourg from being prepared in ecus. The existing Directive 90/604/EEC on annual accounts provides that accounts may be published in ecus, in addition to the national currency, after conversion at the rate on the date the obligation to publish accounts in the national currency. The need to use a specific rate for conversion renders the maintenance of day-to-day accounts in ecus impossible. In practice, the ecu-provision in the directive has only symbolic value.

Wages, salaries, and Contributions to Social Security Funds. Luxembourg and Greece prohibit the setting of wages and salaries in ecus. There is a related practical obstacle in Germany, Spain, Greece and Portugal prohibits the payment to social security contributions in foreign currencies, including the ecu. The actual payment of wages and salaries in ecus is prohibited in Germany, Belgium, Greece, Ireland, Luxembourg, and without central bank permission, in Portugal.

Direct and Indirect Taxes. No Member State except France allows both the determination of the tax base and the payment of tax in ecus. In France, individuals or corporate entities required to pay taxes may provide evidence of their international activity and the fiscal authorities may agree to the denomination of the tax in a foreign currency. In addition, tax advantages are usually granted to securities, investments and savings instruments denominated in the national currency and issued and sold by national financial institutions. As the ecu is a foreign currency in the EU Member States, such tax advantages are not available for ecu instruments.

3. Specific Sector Obstacles

Insurance Sector

Only the United Kingdom, the Netherlands, France and Luxembourg do not impose obstacles to the use of the ecu for company capital, technical reserves, the payment of insurance premiums and the evaluation of claims. Although this industry is increasingly regulated by EU legislation, the use of ecus is not necessarily promoted.

Public Sector Activities

The use of foreign currencies, including the ecu, for public procurement is authorized only in Italy and the Netherlands. There are procedural obstacles to such use in Denmark and the United Kingdom. Partial obstacles exist in France and Greece. However, with the exception of Portugal, there does not seem to be any legal obstacle to the use of the ecu as a financial instrument by federal entities or local authorities in the public sector. This means that these entities may use the ecu for financing purposes, such as loans, bonds and Treasury paper. In addition, except in Germany, Greece and Spain, there are no formal obstacles to the payment of government aid in ecus.

5.3.3 Removing the Obstacles

The following outlines the steps necessary to remove the existing obstacles to the use of the private ecu as proposed by the EC Commission in its White Paper.

Although the gradual development of the use of ecus is necessary, it should not be imposed by the EU of the governments of the Member States. Such a development must be based on the economic advantages, especially in international transactions, and on the preparations for Stage III of the EMU as provided in the Maastricht Treaty. Therefore, entities which desire to use the ecu should not be prevented or discouraged by the laws or procedures in force in the Member States.

The first step in this process is the unequivocal recognition of the existing ecu as a foreign currency. The necessary second step is the removal of all existing obstacles to ensure that the commercial and private uses of the ecu to develop gradually and on a voluntary basis. These steps would assist the ecu to develop into a “currency in its own right” with Stage III as envisioned in the Maastricht Treaty. It also could provide interested parties with the opportunity to get acquainted with and used to the ecu and the single currency principle on a “learn-by-doing” basis prior to the actual introduction of the ecu as the single currency.

The existing obstacles could be removed with the following steps”

1. Establishment of the freedom to conclude contracts in ecus;
2. Introduction of the following:
 - authorization of value and payment clauses in ecus;
 - liberalization of the rules governing ecu accounts to ensure that value and payment clauses are effective;
 - amendment of procedural rules to enable courts to issue judgments in ecus denomination
 - changes in the rules on invoicing and accounting to permit the allocation of assets and liabilities denominated in ecus without conversion;
 - authorizing the payment of VAT and direct taxes on sales and income in ecus.

Belgium is an example a Member State which has used such a step-by-step approach. Measures were taken to remove certain obstacles to the use of ecus from the general laws. Public and official documents now may be denominated in Belgian francs and in ecus or in currency of any OECD member. This decision establishes a general principle and removes the legal basis for a number of obstacles, especially in court procedures and taxation. Implementing legislation for other areas is still necessary.

This latter need poses a significant obstacle. For example, a company may now dominate its capital in ecus. It may not, however, prepare its accounts in ecus because other legislation expressly prohibits such a procedure. The initial amendment of the general law will not be effective until other specific laws have also been amended.

It is difficult set a timetable for such changes for all Member States. The background and legislation and the legislative procedures vary widely among the Member States. In addition, a number of simultaneous measures in different areas must be introduced to regulate and develop pre-existing practice. Many of the sectors in question are independent of each other and the national or EU legislators might address the issues in no particular chronological order. This applies especially to insurance or public procurement which are partially governed by EU legislation. This “piece-meal” approach could result in significant short term uncertainties and problems.

Therefore, it will be in the hands of each Member State to organize its action plan for the ecu on the basis of its specific legal background and the desire to develop the ecu. It will be in the common interest for certain Member States to take the initiative and rapidly allow the widest possible use of the ecu far in advance of the introduction of the new ecu as the single EU currency.

There is a set of five measures which Member States interested in abolishing the existing obstacles to the ecu should undertake:

1. Measures relating to the status of the ecu;
 2. Measures relating to the use of the ecu as a means of payment and a store of value in private contracts;
 3. Measures relating to court decisions;
 4. measures relating to the organization and management of businesses; and
 5. Measures relating to customs and taxation
1. Measure 1: Status of the Ecu

By granting the ecu the legal status of a foreign currency through a government order (Italy and Portugal) or an administrative measure (Belgium, Luxembourg, Greece, France and Spain), or by treating it in practice as a foreign currency (Denmark, Ireland, the Netherlands and, with limitations, the United Kingdom), most Member States permit the treatment of the ecu as any foreign currency. A currency is not necessarily granted official foreign currency status simply because it is legal tender in another country. A Member State may choose to grant foreign currency status only to a limited number of currencies. In Belgium, for example, the central bank maintains a list of 18 currencies subject to special requirements such as quotation on the foreign exchange market. Consequently, except in Germany in the UK, there is no discrimination against the ecu compared to other foreign currencies within the EU Member State.

Therefore, except in the Member States which maintain exchange controls for all foreign currencies, including the ecu, it is possible to obtain and use all existing financial instruments. Only Germany officially still considers the ecu legally as a mere unit of account despite the measures taken by the Bundesbank.

Nevertheless, the status of the ecu as a foreign currency is uncertain as a practical matter in several Member States. In the absence of EU legislation establishing foreign currency status, all member States should now grant the ecu official and uniform of the remaining obstacles on foreign currencies still existing in some Member States, the ecu would then be freely usable.

2. Measure 2: Means of Payment and Store of Value

Following the clarification of the foreign currency status of the ecu, corresponding measures will be necessary for monetary and financing instruments in ecus and the denominated of contracts in ecus. The ecu will not develop into a widely used transaction currency unless the right to denominated contracts in ecus is guaranteed and parties may use all necessary instruments required to fulfill their contractual obligations and manage their debts and claims.

The measures relating to the status of the ecu and the abolition of remaining exchange controls will remove a number of obstacles to the use of the ecu as a means of payment and a store of value. A few obstacles, however, will remain as a result of the impossibility to denominate and negotiate bills in ecus and of the prohibition in certain Member States on effective payment clauses in ecus. Some Member States prohibit the issuance of bills denominated in ecus in their own territory or the payment of bills denominated in ecus issued in other Member States or other countries. It will be important to adopt provisions similar to the uniform laws on negotiable instruments (check, bills of exchange, Certificates of Deposit and promissory notes_ to ensure negotiability for instruments in ecus.

The rules governing ecu bank accounts also must be liberalized and harmonized. Like ecu payment clauses, a well-functioning system of ecu bank accounts free of obstacles is a major factor in ensuring the freedom of payments through the EU. Consequently, individuals and companies must be allowed to hold an unlimited number of accounts in ecus. These accounts must be permitted to bear interest to the same extent as the equivalent national currency accounts. Assets in ecu-denomination must be usable for all banking transactions. Overdrafts should be authorized if they are allowed on similar accounts in the national currency. In no event should they be more restrictive.

In addition to the above measures, ecu bank accounts should be granted the same status as accounts in national currency for the purposes of the prudential obligations of financial institutions. The corresponding monitoring rules must be harmonized.

The distinction between international and domestic contractual clauses on payment currencies must be abolished in all Member States. Rules requiring legal tender for the discharge of liabilities are obstacles to domestic payments in ecus. Freedom of trade requires that a liability can be effectively discharged in the currency in which the debt is denominated. Free movement of goods and services naturally require the corresponding freedom of the counterpart, the payment for such good and services. Therefore, ecu payment clauses in contracts between residents, between residents and non-residents, and between non-residents must be authorized in all Member States.

This includes appropriate provisions to enable courts to refer to the ecu as currency of contract in determining the law applicable to a contract that is silent on this issue. In this respect, the private international law in various Member States must be changed to ensure that, at the request of the interested party, a contract between an EU and a non-EU national in ecu with no choice-of-law provision should be deemed subject to the national law of the EU national.

3. Measure 3: Court Decisions

Once the freedom to denominate contracts and financial monetary instruments in ecus has been guaranteed, these contracts must be enforceable by the courts in the Member States in the currency chosen by the parties. At this point, certain Member States wholly or partially exclude the use of the ecu as a foreign currency in court proceedings. It is important to enable parties to contracts and others entering into commitments in ecus to initiate proceedings and plead claims to obtain legal redress in ecus when contractual obligations are denominated in ecus.

The benefits and advantages of the ecu will remain theoretical as long as there is no guarantee that parties to a contract may insist on payment in ecus. Otherwise, the uncertain and costly process of conversion into the national currency of the place of enforcement will remain a significant obstacle to the use of ecus for private and commercial purposes. In court judgments, the problem of the exchange risk is usually not addressed when a conversion into a national currency is required. As the actual transaction is postponed until the day of effective payment, significant foreign exchange exposure results for the party obtaining a judgment in a foreign currency.

In addition, Member States must authorize precautionary measures for accounts in ecus, foreign currencies and the respective national currency to guarantee corresponding claims. The courts must be able to order provisional measures in ecu-denominated at the request of the interested parties. The enforcement of provisional measures in ecus ordered by a foreign court must be authorized.

Applications and claims in ecus must be accorded the same attention as those in the national currency. There must be no uncertainty about the admissibility of claims for amounts in ecus, about rulings or orders for the payment of money or about the enforcement of such orders in ecus, the respective national currency or a foreign currency. In the event assets in the national or a foreign currency were seized to enforce payments, the debtor would have to bear the conversion costs.

The various arbitration procedures should provide that national or foreign court orders for the payment of ecus can be enforced in ecus.

In addition to these purely monetary questions with regard to the use of ecus in courts proceedings, the matter of compensatory interest payments must be addressed. The applicable interest rates must be defined when the ecu is adopted for procedural purposes. In this respect, the legal ecu interest rate for ecu operations must be harmonized to avoid “forum-shopping”.

4. Measure 4: Business Management and Organization

The ecu has no natural market and will remain a foreign currency for all its users until Stage III of the EMU because there is no sovereign issuer of ecus. This creates problems for corporate entities which must convert their operations into their respective national currencies pursuant to regulations in the Member States. The choice of the dates and the arrangements for the conversion may have significant impacts on the profit and loss account.

Once contractual commitments and payments can be denominated in ecus and can be rendered in any manner and once creditor can require payment in ecus through the courts, the Member States should permit corporate entities to constitute, increase or decrease their capital in ecus, to denominated contributions to the assets in ecus and to float and quote equity in ecus on stock exchanges. Corporate entities should also have the option to make accounting entries and prepare and publish cash journals, annual accounts, consolidated accounts and balance sheets in ecus. To ensure that accounts are not distorted because of different currencies, it must also be possible to use the ecu to pay wages, social security contribution and taxes.

This measure includes the publication and display of prices in ecus and the invoicing in ecus without conversion. Otherwise, the same obstacle to the use of the ecu would remain for transactions in goods, services or capital.

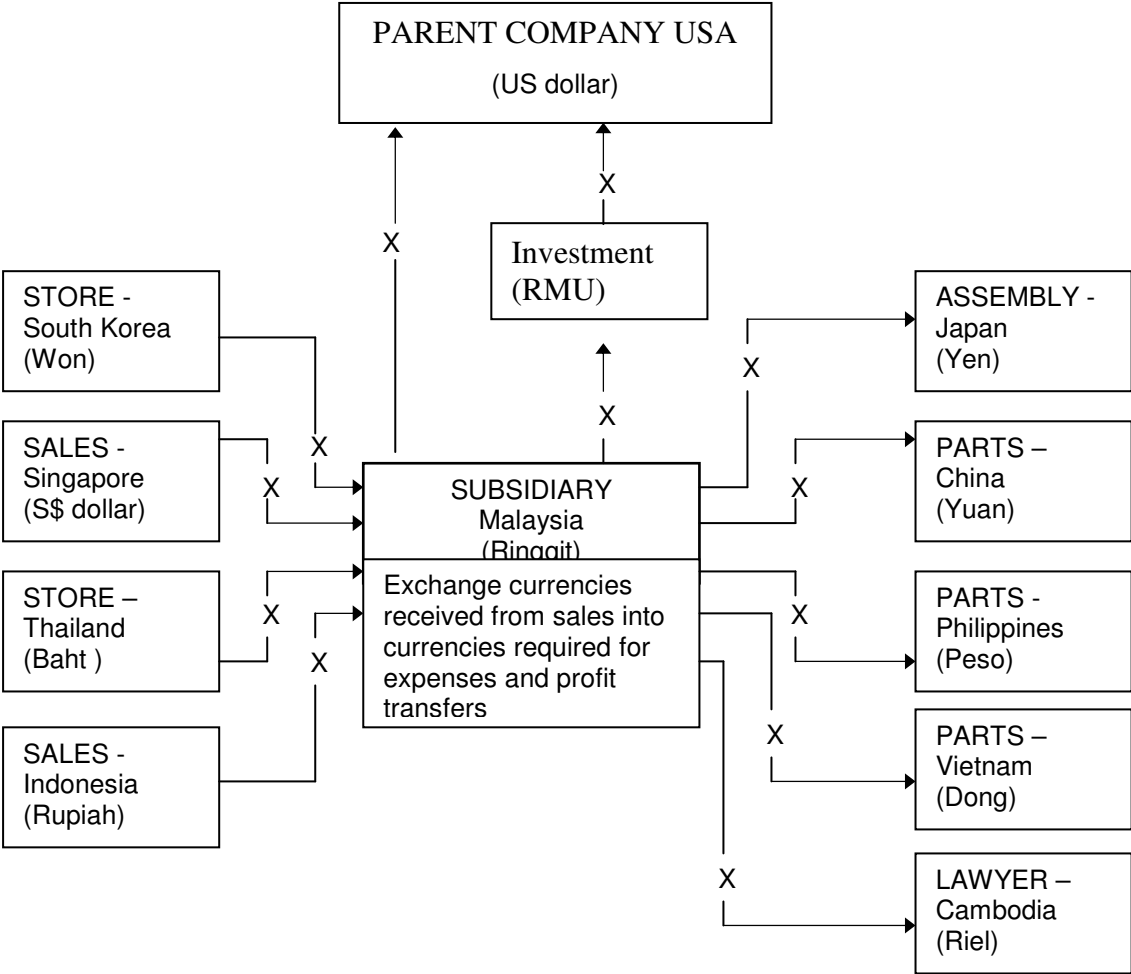
5. Measure 5: Customers and Taxation

Except in France for direct taxes on income resulting from international transactions and in the Netherlands for capital taxes, all tax returns and settlements in the Member States must be in the respective national currency.

In Addition to the disadvantages for a company with accounts in ecus requiring the conversation into the national currency for tax purpose, the difference in the conversation dates for each member States leads to accounting distortions for competing firms in other Member States and for firms with multinational activities. Therefore, it is important not only to determine the tax base and calculate the tax in ecus, but also to permit the settlement of the tax in ecus. As a result, entire business relations could be denominated and settled in ecus without any conversation. This would not make the ecu legal tender as such could be limited to certain types of corporate entities and to the discharge of liabilities between the taxpayers and the authorities.

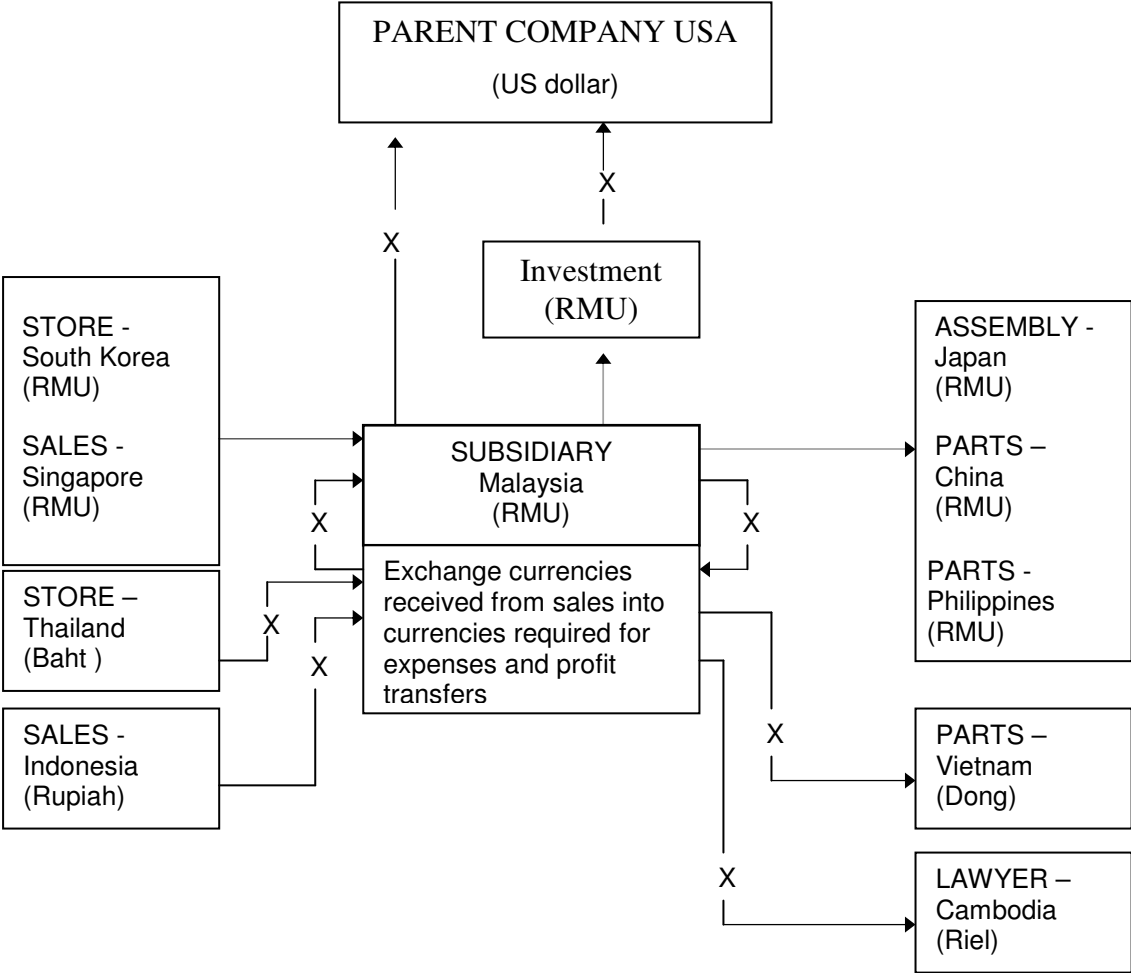
While customs duties are governed by EU legislation, customs valuation, customs duties, anti-dumping duties and other trade protection measure are still denominated and settled in the national currencies. This makes no sense as customs duties constitute direct revenue for the EU budget which itself is denominated in ecu. Therefore, amendments should be made to allow the value for customs purposes to be expressed in ecu. In addition, the settlement of duties in ecus should be permitted and the Member States should establish ecu accounts for such payments.

Figure 5.1: The Transaction



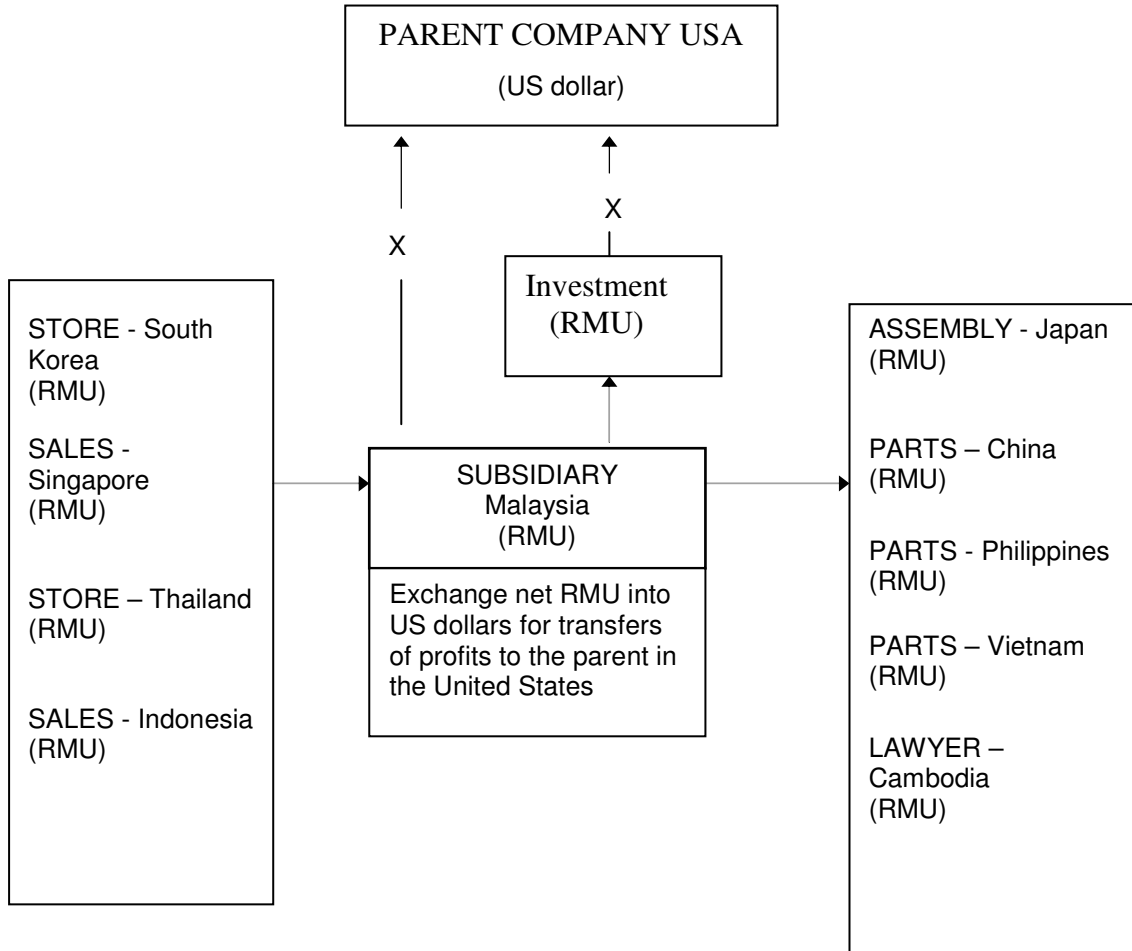
X = exchange required

Figure 5.2: The Interim System



X = exchange required

Figure 5.3: The Single AMU Currency



X = exchange required

6.0 Data Requirement

The ASEAN10+3 countries comprises of 13 countries with different level of economic development. Japan is considered the most highly developed nation among the thirteen economies. This is followed by South Korea and Singapore. Economies in transition include China, Cambodia, Myanmar, Laos and Vietnam. Given the vast differences in the economic stages of development of these countries, economic data (both micro and macroeconomic) is not surprisingly difficult to obtain, and most of the time is not available.

Furthermore, the accessibility of data depend on the nature of the data require; for example, between low frequency and high frequency data; certain macroeconomic data is available at different sample period between countries; consistency of the data series, etc. Nevertheless, most macroeconomic data are available from: *World Development Indicators* by World Bank; *International Financial Statistics* by International Monetary Fund; *Key Indicators of Developing Asian and Pacific Countries* by Asian Development Bank; *SEACEN Financial Statistics-Money and Banking* by The SEACEN Centre, Kuala Lumpur; and *Statistical Bulletin* and websites from the respective Central Banks.

For the computation of the RMU, the following lists of data are needed:

Gross domestic product, nominal
Consumer price index
GDP deflator
Total import, direction of imports
Total export, direction of exports
Bilateral exchange rate, US\$-China Yuan
Bilateral exchange rate, US\$-Korean Won
Bilateral exchange rate, US\$-Japanese Yen
Bilateral exchange rate, US\$-Malaysian Ringgit
Bilateral exchange rate, US\$-Philippine Peso
Bilateral exchange rate, US\$-Thailand Baht
Bilateral exchange rate, US\$-Singapore Dollar
Bilateral exchange rate, US\$-Indonesian Rupian
Bilateral exchange rate, US\$-Euro
Money supply
Interest rates, both short-term and long-term
Other macroeconomic data
Note: Not all data is available on a daily basis.

Nevertheless, we feel that data is not only important at the national (aggregated) level, however, economic data at the regional level is as well important for policy purposes. Studies have indicated that the impact of the adoption of the single currency has affected differently on the regional level. In view of the important implication of the impact of Asian Economic Union on sectoral basis, similar data is required at the disaggregated level.

Country	Regions/Prefecturals/Provinces/States
Japan	Hokkaido, Aomori, Iwate, Miyagi, Akita, Yamagata, Fukushima, Ibaraki, Tochigi, Gumma, Saitama, Chiba, Tokyo, Kanagawa, Niigata, Toyama, Ishikawa, Fukui, Yamanashi, Nagano, Gifu, Shizuoka, Aichi, Mie, Shiga, Kyoto, Osaka, Hyogo, Nara, Wakayama, Tottori, Shimane, Okayama, Hiroshima, Yamaguchi, Tokushima, Kagawa, Ehime, Kochi, Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Miyazaki, Kagoshima, and Okinawa
South Korea	Seoul, Busan, Daegu, Incheon, Gwangju, Daejeon, Ulsan, Gyeonggi-do, Gangwon-do, Chungcheongbuk-do, Chungcheongnam-do, Jeollabuk-do, Jeollanam-do, Gyeongsangbuk-do, Gyeongsangnam-do, and Jeju
Singapore	-
China	Beijing, Tianjin, Hebei, Shanxi, Inner Mongolia, Liaoning, Jilin, Heilongjiang, Shanghai, Jiangsu, Zhejiang, Anhui, Fujian, Jiangxi, Shandong, Henan, Hubei, Hunan, Guangdong, Guangxi, Hainan, Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang
Indonesia	Aceh, Sumut, Riau, Sumbar, Jambi, Sumsel, Lampung, Bengkulu, Jakarta, Jabar, Jateng, DIY, Jatim, Bali, Kalimantan barat, Kalimantan tengah, Kalimantan selatan, Kalimantan timur, sulawesi utara, sulawesi selatan, sulawesi, tengah, sulawesi tenggara, NTB, NTT, Maluku, and Papua
Malaysia	Perlis, Kedah, Perak, Penang, Kelantan, Pahang, Terengganu, Selangor, Melaka, Negeri Sembilan, Johor, Kuala Lumpur FT, Sabah and Sarawak
Thailand	Bangkok Metropolis, Samut Prakan, Phatum Thani, Samut Sakhon, Nakhon Pathom, Nonthaburi, Saraburi, Singburi, Chainat, Ang Thong, Lop Buri, Phra Nakhon Sri Ayuthaya, Chonburi, Chachoengsao, Rayong, Trat, Chanthaburi, Nakhonnayok, Prachinburi, Sa Keaw, Chiang Mai, Lampang, Uttaradit, Maehongson, Chiangrai, Phrae, Lamphun, Nan, Phayao, Nakhonsawan, Phitsanulok, Kamphaengphet, Uthaitani, Sukhothai, Tak, Phichit, Phetchabun, Phuket, Suratthani, Ranong, Phangnga, Krabi, Chumphon, Nakhon Si Thammarat, Songkhla, Satun, Yala, Trang, Narathiwat, Phatthalung, Pattani, Ratchaburi, Kanchanaburi, Phachuap Khiri Khan, Phetchaburi, Suphan Buri, and Samut Songkhram
Philippines	NCR Metro Manila, CAR Cordillera, I Ilocos Region, II Cagayan Valley, III Central Luzon, IV Southern Tagalog, V Bicol Region, VI Western Visayas, VII Central Visayas, VIII Eastern Visayas, IX Western Mindanao, X Northern Mindanao, XI Southern Mindanao, and XII Central Mindanao

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Appendix

(I) Choices Among the Alternatives Asia Monetary Units (AMUs)

The empirical results based on the econometric models (convergence criteria) in the previous section suggest that the best composition of countries in East Asian to be included in the AMU is ASEAN 5 + Japan + China. In order to compare the robustness of this composition of countries, we evaluate the performance of the four AMUs in terms of their volatilities using the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model developed by Bollerslev (1986). The four AMUs that consist of different East Asian economies are as follow:

- (i) AMU for ASEAN 10 + 3 (as the benchmark indicator)
- (ii) AMU for ASEAN 5 + 3
- (iii) AMU for ASEAN + Japan + China (from the econometric models)
- (iv) AMU for ASEAN + Japan + Korea

Figure 1 shows the four alternative AMUs following Ogawa's approach with different weights of East Asian currencies¹¹. As shown in this figure, the four alternatives AMUs are stable throughout the year from January 2000 until November 2006 (daily data). The component currencies of the ASEAN 5 + 3 has the highest currency of the AMU, whereas the lowest is from the component of ASEAN 5 + Japan + South Korea.

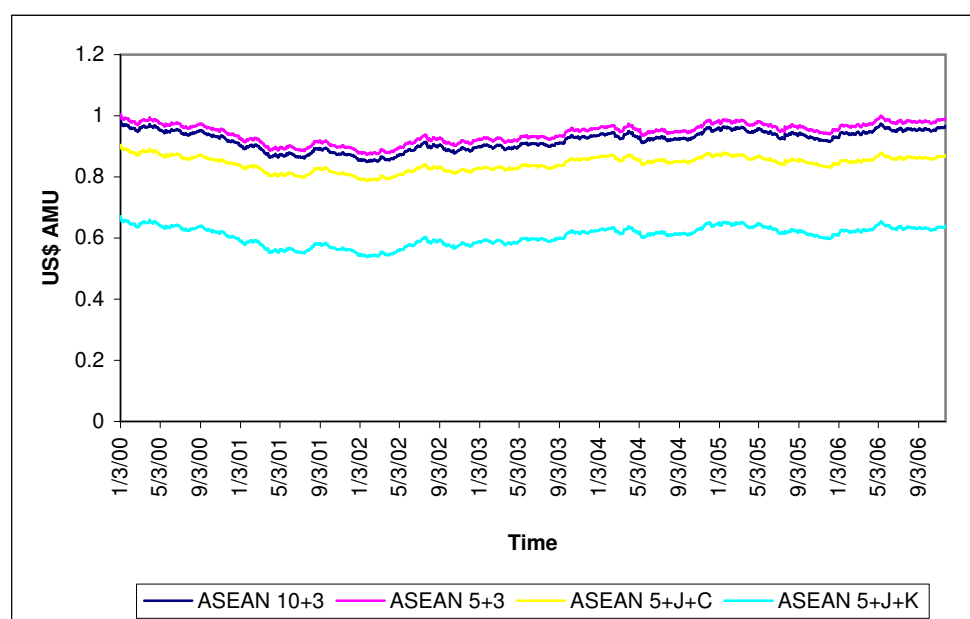


Figure 1: The AMU in terms of the US\$ based on Different Composition from East Asian Countries

¹¹ The AMU and AMU deviation indicators data sets, as well as the AMU weights of East Asian currencies are available at: <http://www.rieti.go.jp/users/amu/en/index.html>

Figure 2 depicts the changes of these four AMUs, where the ASEAN 5+J+K illustrates the highest deviation compared to other three alternatives regional monetary units.

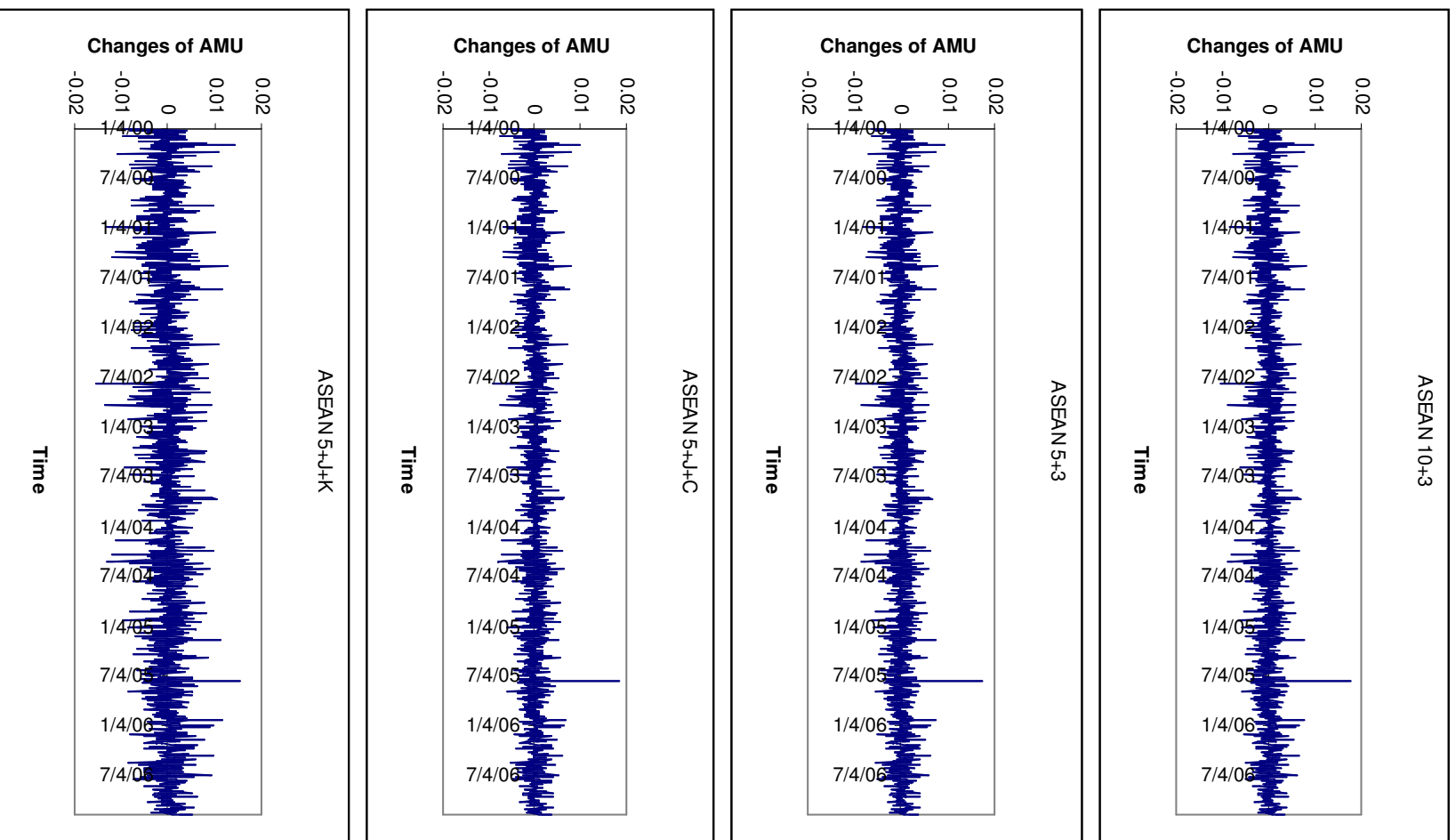


Figure 2: Changes of Four Alternative Components of AMUs

Table 1: GARCH(1,1) Parameter Estimation of Four Alternative AMUs

$$V(\varepsilon_t : \Omega_{t-1}) = \sigma_t^2 = w + \sum_{i=1}^q \alpha_i \varepsilon_{t-i}^2 + \sum_{j=1}^p \phi_j \sigma_{t-j}^2$$

	ASEAN 10 + 3	ASEAN 5 + 3	ASEAN 5+J+C	ASEAN 5+J+K
W	2.16×10^{-7} (4.22)***	2.11×10^{-5} (4.21)***	1.83×10^{-7} (5.23)***	4.13×10^{-7} (4.01)***
α	0.0185 (3.47)***	0.0180 (3.33)***	0.0124 (2.72)***	0.0208 (3.91)***
ϕ	0.9393 (77.87)***	0.9383 (75.19)***	0.9494 (106.96)***	0.9426 (83.11)***
$\alpha + \phi$	0.9578	0.9563	0.9618	0.9634
Diagnostic Tests				
Ljung Box (12) for the Levels	18.346 (0.105)	10.963 (0.532)	18.260 (0.108)	7.473 (0.825)
Ljung Box (12) for the Squares	8.324 (0.759)	1.254 (0.999)	7.276 (0.838)	1.152 (0.999)
Sign Bias	0.266 (0.915)	0.310 (0.930)	0.065 (0.274)	0.128 (0.973)
Negative Size Bias	-0.201 (-1.180)	0.009 (0.031)	-0.487 (-0.045)	-0.010 (1.029)
Positive Size Bias	-0.051 (-0.235)	-0.093 (-0.355)	0.046 (0.133)	-0.108 (-0.350)
Joint Test	1.510 (0.679)	4.172 (0.243)	0.508 (0.917)	4.218 (0.238)

Notes: *** denotes statistical significance at the 1% level. The values in parentheses indicate t-statistics, except for the Ljung Box tests and joint test, which are p-values.

Figure 3 plots the GARCH(1,1) forecasts of the conditional variance for four alternative AMUs. As shown in this figure, the ASEAN 5 + Japan + South Korea has the highest conditional variance compared to other three alternatives, which is consistent with Figure 2 that this component demonstrates the highest fluctuation.

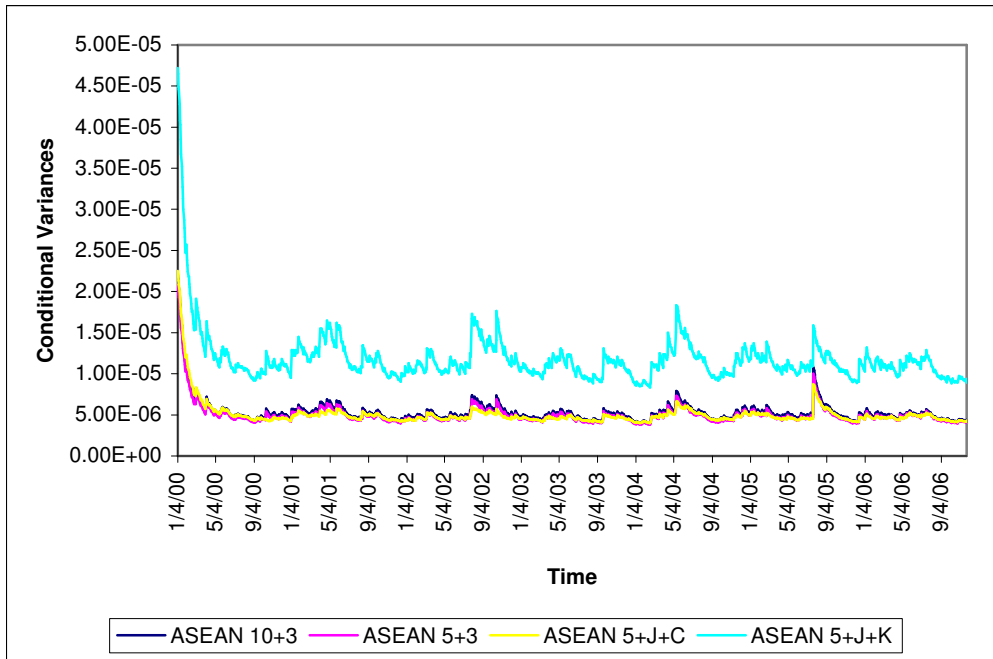


Figure 3: Conditional Variance based on GARCH(1,1) of Four Alternative AMUs

Having determined the conditional variance, the next step is to compute the unconditional variance and the estimated result is presented in Table 2. As shown in this table, the AMU which is composed of ASEAN 5 + Japan + South Korea has the highest unconditional variance or volatility. On the other hand, the AMU that suggested in this study based on econometric model, which is composed of ASEAN 5 + Japan + China demonstrate the lowest unconditional variance or volatility. This finding suggests that the GARCH model, which is able to show the behaviour of volatility as good evidence in favour of the econometric model.

Table 2: Unconditional Variance of GARCH(1,1) Specification of Four Alternative AMUs

AMU consists of:	Unconditional Variance
ASEAN 10 + 3	0.00000513
ASEAN 5 + 3	0.00000483
ASEAN 5 + J + C	0.00000480
ASEAN 5 + J + K	0.00001130

Test for Equality of Variance between two composition of AMUs

Table 4 reports the variance equality results outlined in the above. These tests reveal that the variances between AMUs, which consists of ASEAN 10 + 3 and ASEAN 5 + Japan + China are similar, where four of the tests suggest no different variances. However, the other comparisons between two compositions of AMUs have different variances, with the differences being significant at the 1% and 5% levels.

Table 4: Test for Equality of Variances between AMUs

Grouping	F-statistic	Siegel-Tukey	Bartlett	Levene	Different in Variance
ASEAN 10+3 & ASEAN 5 + 3	1.16***	3.52***	10.14***	2.68	Yes
ASEAN 10+3 & ASEAN 5+J+C	1.06	0.38	1.40	3.58	No
ASEAN 10+3 & ASEAN 5+J+K	4.97***	2.21**	1048.15***	190.55**	Yes
ASEAN 5+3 & ASEAN 5+J+C	1.23***	5.97***	19.04***	0.14	Yes
ASEAN 5+3 & ASEAN 5+J+K	5.77***	1.88*	1233.17***	222.13***	Yes
ASEAN 5+J+C & ASEAN 5+J+K	4.70***	2.42**	982.34***	218.20***	Yes

Note: ***/**/* denote statistical significance at 1%, 5% and 10% levels, respectively.

Table 3: GARCH(1,1) Estimation with Generalized Error Distribution (GED)

$$V(\varepsilon_t : \Omega_{t-1}) = \sigma_t^2 = w + \sum_{i=1}^q \alpha_i \varepsilon_{t-i}^2 + \sum_{j=1}^p \phi_j \sigma_{t-j}^2$$

	ASEAN 10 + 3	ASEAN 5 + 3	ASEAN 5+J+C	ASEAN 5+J+K
w	1.98×10^{-7} (2.39)**	1.91×10^{-5} (2.38)**	1.78×10^{-7} (2.63)***	4.01×10^{-7} (2.37)**
α	0.0229 (2.44)**	0.0227 (2.40)**	0.0196 (2.22)**	0.0253 (2.68)***
ϕ	0.9381 (45.68)***	0.9374 (44.65)***	0.9431 (53.14)***	0.9392 (48.31)***
$\alpha + \phi$	0.9610	0.9601	0.9627	0.9645
Unconditional Variance	0.00000508	0.00000479	0.00000478	0.00001131

Notes: **/* denote statistical significance at the 1% and 5% levels, respectively. The values in parentheses indicate t-statistics.