

ARE COUNTRIES OF ASSOCIATION OF SOUTH EAST ASIA NATIONS (ASEAN) CANDIDATES OF OPTIMUM CURRENCY AREA FOR MONETARY UNION? A STRUCTURAL VAR APPROACH

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Intra-trade among ASEAN countries have remained around 20% over the period 1993 until 2001 (ASEAN Secretariat). With this significant amount of trade being conducted between members of ASEAN countries, businesses were faced with exchange rate exposure due to the volatility of the exchange rate within the regions as was experienced during the Asian Financial Crisis of 1997-98. Members of the European Union overcome this exchange rate exposure by agreeing to form a monetary union and adopting Euro as their common currency in 1999.

This paper examines the feasibility of a Optimum Currency Area (OCA) for ASEAN 9 to adopt a common currency, especially after the 1997-98 Asian Financial Crisis. Using macro-economic data for 9 ASEAN countries over the 15 years period (1990–2004), the paper addresses whether an OCA would be well suited for these countries, following the trails of Euro formation.

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INTRODUCTION

After the successful introduction of Euro on eleven countries of Europe¹ seven years ago, and the expanding trend of continuous Euro adoption by increasing numbers of countries², there have been lots of researches made on whether the replication of Euro experiences can be implemented on ASEAN. This is especially true after the lesson of 1997/1998 Asian Financial Crisis, where dollar dominant exchange rate regime was not desirable for financial stability. Namable options alternative to counter this will be currency peg (either to a single currency or basket of currencies), flexible exchange rate regime or monetary union. In fact, after ASEAN financial crisis, Korea, Thailand, and Indonesia have moved to the flexible exchange rate regime. However, ASEAN countries numerous effort, for example the Chiang Mai initiatives which

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was initiated at year 2000, and also ASEAN Economic Community (AEC) in 2002, seems to point to the interest of forming a common currency area, mimicking the European monetary union. That leads to the question of whether ASEAN is an Optimum Currency Areas (OCA), fulfilling the criteria set forth by Mundell (1961), McKinnon (1963) and Kenen (1969).

APPROACHES ON ECONOMICS AND TRADE INTEGRATIONS AMONG ASEAN

Since ASEAN establishment in year 1967, the members of ASEAN have extensive experiences with regional cooperation, and have had almost 40 years of political, military and trade cooperation. Among the initiatives for economics and trade integrations are:

ASEAN Economic Community (AEC)

The ASEAN Economic Community (AEC) vision is towards the “many countries, one economy” for ASEAN, and was founded in the Eighth Summit in Phnom Penh on November 4, 2002. The AEC is considered as an end goal for the ‘Roadmap for the Integration of ASEAN’ and ‘Vision 2020’. Among the objectives of its establishment are to create a stable, prosperous and competitive ASEAN economic region in which free flow of goods, services, investment and skilled labors can take place. Moreover, flow of capital should be better, with the aim to achieve equitable economic development, reduced poverty and socio-economic disparities by the year 2020. The possibility of creating an ASEAN Currency Unit (ACU) was mentioned in the ASEAN Secretariat report “Recent Developments in ASEAN Economic Integration”³.

Chiang Mai Initiatives

The Chiang Mai Initiative (CMI) was announced by the ASEAN+3 finance ministers, convening in May 2000. The CMI can be considered as an expansion of the earlier existing swap arrangement among the five original ASEAN members: Malaysia, Indonesia, Philippines, Singapore and Thailand, which was known as the ASEAN Swap Arrangement (ASA).

The CMI agreements were made to facilitate the exchange of consistent, timely data and information, and to establish a regional financing arrangements. The initiatives provided an expanded ASEAN swap arrangement, a network of bilateral swap agreements and also repurchase arrangements among the ASEAN+3 nations⁴, in preparation of any future financial crisis. The networks of bilateral swap arrangements have been expanded from 12 to 16 agreements since August 2003, bringing the total size of the network to US\$36.5 billion.

ASEAN Free Trade Area (AFTA)

Tariff liberalization under AFTA is to be implemented through progressive tariff cuts via the Common Effective Preferential Tariff (CEPT) scheme. Tariffs on all manufactured and processed agricultural products are to be brought down to 0-5 per cent, initially over a period of 15 years starting 1st January 1993. For the case of Vietnam, Laos, and Myanmar that joined ASEAN only recently, separate CEPT datelines were set in view of their economic structures. Tariffs will ultimately be completely abolished by 2010 for the original ASEAN 6 and by 2015 for the newer members with flexibility on some sensitive products until 2018 (Kwek, Tham and Tan, 2004).

This paper explores the possibility of a monetary union base on OCA for ASEAN 9⁵, with significant consideration being emphasized on the peripheral ASEAN countries⁶. The study is designed to address the followings: (i) Historical and existing approaches on economics and trade integrations among ASEAN (ii) Optimum Currency Area theories discussion (iii) Pros and Cons of monetary union and their implications on ASEAN 9. (iv) Influences of Euro formation on ASEAN countries. (v) Are all countries of ASEAN 9 best suited for an OCA or sub grouping of countries should be made? This paper is structured into five sections. Section two layout literature reviews, cost and benefits of monetary union, replication of Euro experiences on ASEAN, and whether monetary union is feasible in ASEAN. Section three describes the methodology, quantitative approaches and data collection. Section four discusses the analysis results and its implications. The final section concludes.

LITERATURES REVIEW

Mundell (1961) defined Optimum Currency Area (OCA) as “*a domain within which exchange rates are fixed.*” There are several preconditions considered necessary for an OCA. Mundell argues that a high degree of factor mobility is crucial. McKinnon (1963) pointed that trade intensity or integration as prerequisites. Kenen (1969) examined regional production patterns for product diversification to determine if a region would be well suited for an OCA. Recent published literatures and research works have shown that factors such as intra regional trade, openness of economy, similar inflation levels, and similarity of monetary policy are essentials for qualifying the forming of monetary union.

Mundell (1961) provided the first theoretical framework for optimum currency area. He argued that a region with highly correlated shocks would form an optimum currency area. This is due to the fact that the entire region would be able to use a common monetary policy to respond to economic shocks to the region. Hence, if shocks to the ASEAN countries are highly correlated, this would provide evidence in support of forming a monetary union. He further pointed out that countries’ experiencing positively correlated shocks are more suitable candidates for a monetary union. If economic shocks are positively correlated among the members, universal policies can be implemented to correct any imbalances. Hence, the loss of the nominal exchange rate and monetary policy as policy instruments are of lesser consequence. In addition, the formation of a monetary union requires additional focus on three interrelations among the potential members. The interrelations are extent of trade intensity, mobility of labor between countries and system of risk sharing.

Among the main attractions of monetary unions are the gains through the reduction of transaction costs and exchange rate uncertainties. Economies like ASEAN that have a large volume of mutual trade shall obtain greater welfare gains from a monetary union. The reduction in transaction costs comes from elimination of exchanging rate cost. In addition, in a world with risk-averse individuals, a common currency area can generate welfare gains by reducing uncertainties about exchange rate changes (De Grauwe, 1997). Both these benefits are directly related to the amount of trade the countries in the proposed currency area conduct with one another.

Costs and Benefits of Monetary Union and the Implication on ASEAN

The major benefit of joining a monetary union will be exchange rate stability where greater predictability of relative prices can be made, lowered transaction cost due to the elimination of bid-ask spreads on currency conversion, increase in cross-border investments and trade with competitiveness and efficiency enhanced. Another indirect benefit would be the ability to decouple from the vagaries of external currencies, in particular the US Dollar.

The most obvious cost of a monetary union is the loss of country's sovereignty on monetary policy. This means the loss of ability to manipulate nominal exchange rate as an economic instrument for macroeconomic adjustment to stabilize domestic economy, and also inability to carry out independent monetary policy. Therefore, country face with an asymmetric shock cannot respond on its own, but it has to rely on a collective response on member countries. Since political sovereignty is often an issue, the decision on whether to join an OCA is inherently a political not economic one.

Replication of Euro Experiences on Formation of ASEAN Currency

With the successful implementation of Euro, questions arise such as – Is replication of Euro experiences on formation of ASEAN currency viable? What are the lessons that can be transferred to formation of ASEAN common currency countries based on Euro history? Wyplosz, (2001) pointed out that Europe's message to Asia is that monetary union is a long way down the path of gradually increasing cooperation. The Euro's introduction would simply be the culmination of a long evolutionary process towards single currency. The process itself is more than 50 years old. He pointed out four major differences of Asia from Europe. First is the sequencing. Europe started with trade cooperation, Asia envisions monetary cooperation while having failed, so far, to develop a framework for common trade agreements. The second is that Asian countries are concerned with exchange rate stability vis-à-vis the world at large (i.e. the yen, the US dollar and the Euro) as with stability within the region. The result is plans to adopt common pegs and to establish swap arrangements, rather than plans to jointly float vis-à-vis the rest of the world while agreeing to mutual support to defend regional parities. The third difference is the apparent reluctance to engage in collective institution-building. Trade agreements are slow to materialize and are left to a complex web of bilateral agreements. The last difference is capital liberalization has been achieved before exchange rate stability. This raises the stakes, making soft pegs - politically easier to establish a non-starter.

Can ASEAN Monetary Union be A Reality?

The most important factor favouring an ASEAN monetary union is the trend in intra regional trade. In line with this, intra regional investment has also been growing impressively. Obiyathulla (2005) realized that there are at least two reasons why growth in intra regional trade and investment are strongly favourable to formation of monetary union. The first is the obvious fact that such links push countries together, helping them to overcome prejudices, cultural differences and political inertia. The second and more important effect is that, trade expansion works to synchronize business cycles. As regional markets become interlocked through trade dependence, even countries with different business cycles can be harmonized

over time. Such synchronization makes possible the use of common collective policies that a monetary union would entail.

Another reason for the interest in an ASEAN monetary union is solving “The Original Sin” problem, brought out by Eichengreen and Hausmann (1999). The original sin means the inability of a country or its corporations to issue or raise debt denominated in its own currency. A regional common currency would substantially reduce if not eliminate such inadequacies. The high correlation of ASEAN currencies to the US Dollar implies a high cross correlation among themselves. This is favourable to formation of a monetary union where it reduces the potential adjustments needed for coordinated exchange rates.

However, there are also factors that discourage the formation of monetary union. The diversity of history, culture, language, religion, government, and levels of development could form a serious obstacle to closer integration among the Asian countries. Huge disparity exist within ASEAN 9. This disparity is not just in economics but also in political and cultural spheres. For example, Singapore has a per capita income almost 40 times that of Indonesia; and when compared to Cambodia and Myanmar are even more. In addition to economic disparities, factor mobility remains low, compared to the EU standard. The large population disparity and the politically sensitive nature of labor migration has kept labor mobility low.

As a result of the above argument, question arises on whether sub grouping should be made among advanced countries like Singapore, Malaysia, Philippines and Thailand, and also among Cambodia, Laos, Myanmar and Vietnam? Yuen (2001) pointed out a practical approach towards regional monetary integration would be to start with smaller currency areas. The smaller sub-groupings could first focus on internal harmonization with each other, and then on external harmonization with the other regional sub-groupings as the intermediate and longer-term strategies.

METHODOLOGY AND DATA

The Structural Vector Autoregression (SVAR) Model

An Optimal Currency Area implies common policies. Potential candidates would be countries that respond in a similar way to external shocks. Hence, if shocks are uncorrelated, the countries will not be able to use monetary policy to facilitate adjustment to them. However, if the shocks are positively correlated, a union-wide policy can be used to facilitate adjustment, and would strengthen the case for a monetary union. Blanchard and Quah (1989) are among the pioneers to use Structural Vector Autoregression (SVAR) methodology. Bayoumi and Eichengreen (1993) modified their version to identify countries for a monetary union. Since then, the technique has been used extensively in OCA related research. SVAR permits all variables to interact linearly with their own and each others current and past values. Therefore, one can determine the quantitative impact that each variable has on its own future value and the future values of the other variables.

In this paper, a three-variable SVAR open economy model was employed to examine the shocks according to the OCA literature. Following Zhang (2004), all variables in the model are expressed in natural logarithms. The three variables are defined as (i) domestic output, y_t (ii) bilateral real exchange rate relative to the US dollar, q_t and (iii) domestic price level, p_t .

Let $\Delta x_t \sim [\Delta y_t, \Delta q_t, \Delta p_t]'$ and $\varepsilon_t \sim [\varepsilon_{st}, \varepsilon_{dt}, \varepsilon_{mt}]'$, where Δ represents the first-difference operator, and $\varepsilon_{st}, \varepsilon_{dt}, \varepsilon_{mt}$ denote supply, demand and monetary shocks (or impulse in SVAR terms), respectively. The structural model can be written as:

$$\Delta x_t = A_0 \varepsilon_t + A_1 \varepsilon_{t-1} + \dots = A(L) \varepsilon_t \tag{1}$$

where

$$A(L) = \begin{bmatrix} A_{11}(L) & A_{12}(L) & A_{13}(L) \\ A_{21}(L) & A_{22}(L) & A_{23}(L) \\ A_{31}(L) & A_{32}(L) & A_{33}(L) \end{bmatrix}$$

It is assumed that the structural shocks $\varepsilon_t \sim [\varepsilon_{st}, \varepsilon_{dt}, \varepsilon_{mt}]'$ are serially uncorrelated, which mean they have zero means, constant variances and a covariance matrix normalized to the identity matrix. The model implies that the macroeconomic variables are subject to three structural shocks. In order to identify the structural shocks, the following long run restrictions are imposed: (i) only supply shocks affect relative output in the long run; (ii) both supply and demand shocks affect real exchange rates in the long run; and (iii) monetary shocks have no long run effect on either relative output or real exchange rates. These long run restrictions amount to $A_{12}(1) = A_{13}(1) = A_{23}(1) = 0$. All three shocks are allowed to have long run effect on prices.

The reduced-form SVAR model for estimation is as follows:

$$\Delta x_t = B(L) \Delta x_{t-1} + u_t \tag{2}$$

where u_t is a vector reduced-form disturbance. A moving average (MA) representation of equation (2) is:

$$\Delta x = C(L) u_t \tag{3}$$

or

$$\begin{bmatrix} \Delta y_t \\ \Delta q_t \\ \Delta p_t \end{bmatrix} = \sum_{i=0}^{\infty} \begin{bmatrix} c_{11i} & c_{12i} & c_{13i} \\ c_{21i} & c_{22i} & c_{23i} \\ c_{31i} & c_{32i} & c_{33i} \end{bmatrix} \begin{bmatrix} \varepsilon_{s,t-1} \\ \varepsilon_{d,t-1} \\ \varepsilon_{m,t-1} \end{bmatrix}$$

where $C(L) = (I - B(L))^{-1}$ and the lead matrix of $C(L)$ is, by construction, $C_0 = I$. By comparing equations (1) and (3), we can see that $u_t = A_0 \varepsilon_t$. Hence, by obtaining the estimates of A_0 , the recovery of the time series of structural shocks, ε_t can be made. The reduced form disturbances u_t are obtainable after SVAR estimation.

As the structural shocks are mutually orthogonal and each shock has a unit variance, the following relationship between the covariance matrices is obtained:

$$C(1) \Sigma C(1)' = A(1) A(1)' \tag{4}$$

Σ is the variance covariance symmetric matrix obtainable from VAR estimation, and is also denoted as $\Sigma = E u_t u_t' = E A_0 \varepsilon_t \varepsilon_t' A_0' = A_0 A_0'$. If Z denotes the lower triangular Choleski decomposition of $C(1)\Sigma C(1)'$, then $A(1) = Z$ as the long run restrictions imply that $A(1)$ is also lower triangular. Consequently, $A_0 = C(1)^{-1}A(1) = C(1)^{-1}Z$. By using SVAR estimation, A_0 can be estimated. Hence, using this A_0 value, the time series of structural shocks $\varepsilon_t \sim [\varepsilon_{st}, \varepsilon_{dt}, \varepsilon_{mt}]'$ can be recovered by $\varepsilon_t = A_0^{-1} u_t$

Data

The major data sources used in this paper are from IFS (International Financial Statistics)⁷, which covers 9 countries over the 15 years period of 1990– 2004. Real GDP is used as a proxy for real output variables, the real exchange rate is calculated using CPI and the bilateral nominal exchange rate of the ASEAN economies relative to the US dollar, and consumer price index (CPI) as a measure of changes in prices. All data are annually and seasonally unadjusted. Table 1 lists the countries and their abbreviations.

Table 1
ASEAN Countries and Abbreviation

1	Indonesia	IND
2	Thailand	THL
3	Malaysia	MYN
4	Philippines	PHP
5	Singapore	SGP
6	Myanmar	MIA
7	Vietnam	VTM
8	Cambodia	CAM
9	Laos	LAO

The time series properties of the variables have been investigated, and it was found that most variables are $I(1)$, based on the Phillips-Peron and KPSS tests. Therefore, the first differences of all variables are used to ensure the stationarity of the variables. For estimation of the VAR, one lag is chosen, based on Schwarz Information Criterion (SIC). Significance levels are assessed using Fisher’s Z transformation⁸, with null hypothesis correlation coefficient is zero.

RESULTS & ANALYSIS

Correlation Analysis

As an overall, ASEAN economies display a less obvious pattern in GDP growth compared with inflationary movements, as per Tables 2 and 3. This confirms to Zhang (2004) findings. Table 2 shows the correlation coefficients of real output (GDP) growth of the 9 ASEAN countries. It is obvious that Malaysia, Singapore and Thailand are positively correlated . The result also shows that strong correlation exist between Cambodia and Vietnam.

Inflation across the ASEAN countries are also significantly correlated, with the exception of Myanmar and Laos. This result is expected due to the economics performance of both countries are similar. The overall result suggests that ASEAN countries have been pursuing fairly similar monetary policies.

Table 2
Correlation of Real GDP Growth (%) Among ASEAN Countries

	<i>CAM</i>	<i>IND</i>	<i>LAO</i>	<i>MIA</i>	<i>MYN</i>	<i>PHP</i>	<i>SGP</i>	<i>THL</i>	<i>VTM</i>
CAMBODIA	1.00								
INDONESIA	-0.08	1.00							
LAOS	-0.21	0.51	1.00						
MALAYSIA	0.33	-0.42	-0.36	1.00					
MYANMAR	-0.05	-0.11	0.02	-0.45	1.00				
PHILIPPINES	0.02	0.12	0.11	0.51	-0.71	1.00			
SINGAPORE	0.42	-0.29	-0.38	0.93	-0.49	0.54	1.00		
THAILAND	0.44	-0.52	-0.70	0.70	-0.39	0.33	0.70	1.00	
VIETNAM	0.76	-0.13	-0.30	0.47	-0.37	0.44	0.49	0.68	1.00

Notes: 1. Annually data are used for the real GDP growth rate.

2. GDP growth rates denote the percentage change over the corresponding period in the previous year.

Table 3
Correlation of Inflation (%) Among ASEAN Countries

	<i>CAM</i>	<i>IND</i>	<i>LAO</i>	<i>MIA</i>	<i>MYN</i>	<i>PHP</i>	<i>SGP</i>	<i>THL</i>	<i>VTM</i>
CAMBODIA	1.00								
INDONESIA	0.28	1.00							
LAOS	0.04	0.71	1.00						
MALAYSIA	0.69	0.47	0.18	1.00					
MYANMAR	0.12	0.48	0.03	0.22	1.00				
PHILIPPINES	0.25	0.18	-0.04	0.69	0.10	1.00			
SINGAPORE	0.16	-0.53	-0.55	0.36	-0.30	0.60	1.00		
THAILAND	0.44	0.34	0.01	0.77	0.21	0.57	0.40	1.00	
VIETNAM	0.68	0.50	0.39	0.30	0.38	-0.11	-0.40	0.23	1.00

Notes: 1. Annually data are used for the CPI inflation rate.

2. CPI inflation rates denote the percentage change over the corresponding period in the previous year.

Looking at the correlation of ASEAN exchange rate with US dollar in Table 4, we see a strong and significant relationship. All countries appear to be correlated except Cambodia, Myanmar and Singapore. This is to be expected given Cambodia and Myanmar economic performance is at no par with Singapore. Cambodia and Myanmar are still relatively conservative in terms of trade and hence, the foreign exchange rate is less subject to market fluctuation due to less demand.

SVAR Analysis: Correlation of The Structural Shocks

Among the ASEAN 9 economies, supply shocks are significantly correlated in some ASEAN countries, namely Malaysia, Singapore, Thailand and Philippines. Table 5 shows the findings of supply shocks. Myanmar, Laos and Cambodia have no significant correlation with other ASEAN economies except Vietnam. As the OCA criteria has suggested, if the symmetric shocks are occurring more in the region, the correlations are greater in supply shocks. Thus, the more significant correlations in supply shocks, the more feasible it is for these economies to establish an OCA. The results here only show sign of correlation among the more developed ASEAN countries with Vietnam.

Table 4
Correlation of ASEAN Country Exchange Rate in US Dollar

	<i>CAM</i>	<i>IND</i>	<i>LAO</i>	<i>MIA</i>	<i>MYN</i>	<i>PHP</i>	<i>SGP</i>	<i>THL</i>	<i>VTM</i>
CAMBODIA	1.00								
INDONESIA	0.83	1.00							
LAOS	0.78	0.89	1.00						
MALAYSIA	0.79	0.98	0.89	1.00					
MYANMAR	0.20	0.49	0.37	0.51	1.00				
PHILIPPINES	0.80	0.93	0.97	0.92	0.37	1.00			
SINGAPORE	0.10	0.56	0.58	0.62	0.71	0.56	1.00		
THAILAND	0.83	0.99	0.91	0.97	0.55	0.94	0.57	1.00	
VIETNAM	0.91	0.86	0.88	0.83	0.22	0.90	0.26	0.87	1.00

Table 5
Correlation of Supply Shock among ASEAN Countries

	<i>CAM</i>	<i>IND</i>	<i>LAO</i>	<i>MIA</i>	<i>MYN</i>	<i>PHP</i>	<i>SGP</i>	<i>THL</i>	<i>VTM</i>
CAMBODIA	1.00								
INDONESIA	0.08	1.00							
LAOS	0.36	0.78*	1.00						
MALAYSIA	0.11	-0.19	-0.21	1.00					
MYANMAR	0.20	-0.03	0.10	-0.28	1.00				
PHILIPPINES	-0.75	-0.02	-0.35	0.27	-0.04	1.00			
SINGAPORE	-0.53	-0.47	-0.79	0.45**	-0.47	0.60*	1.00		
THAILAND	-0.21	-0.54	-0.81	0.43	-0.29	0.39	0.85*	1.00	
VIETNAM	-0.18	-0.28	-0.41	0.58*	-0.40	0.08	0.53*	0.52*	1.00

* indicates correlation is significant at 5% level .

** indicates correlation is significant at 10% level .

Table 6 shows the finding on demand shocks. The results show that there are more correlations among the economies compared to supply shocks. This confirms to Kwek (2004) findings. Four countries appear to respond positively and significantly to the demand shocks. The four includes Cambodia, Malaysia, Philippines, and Vietnam. This indicates that Cambodia and Vietnam are more closely linked to other ASEAN countries compared to Laos and Myanmar.

Table 7 shows the results for the monetary shocks. The findings suggest that there are more correlations than both supply and demand shocks in the ASEAN 9 in the analyzed sample period. The numbers of significant correlations of monetary shocks between Cambodia, and Vietnam with other ASEAN countries are to be noted. This shows that monetary shocks of ASEAN as a whole tend to be more symmetric than the supply and demand shocks. This could be due to the strong developing financial links of this region, especially since the late 1980s with increasing market integration of the regional economies (Yuen, 2000).

The results of the correlation matrix of structural shocks of this study show that supply shocks are not highly correlated and asymmetric shocks seem prevail in the region. Therefore, based on the OCA criteria, the results do not strongly suggest that OCA is present in the ASEAN 9 economies. However, the results of demand and monetary shocks support a common currency possibility in the ASEAN region. Thus, dividing ASEAN countries to subgroups are deem

highly recommended, with sub grouping of Singapore, Malaysia and Thailand in a group while Cambodia and Vietnam in another sub group.

Table 6
Correlation of Demand Shock among ASEAN Countries

	<i>CAM</i>	<i>IND</i>	<i>LAO</i>	<i>MIA</i>	<i>MYN</i>	<i>PHP</i>	<i>SGP</i>	<i>THL</i>	<i>VTM</i>
CAMBODIA	1.00								
INDONESIA	0.67*	1.00							
LAOS	-0.54	-0.30	1.00						
MALAYSIA	0.53*	0.16	-0.19	1.00					
MYANMAR	0.48**	0.28	-0.11	0.18	1.00				
PHILIPPINES	0.59*	0.30	-0.26	0.77*	0.52*	1.00			
SINGAPORE	0.42	0.02	-0.07	0.64*	0.59*	0.75*	1.00		
THAILAND	-0.12	-0.12	0.29	0.23	0.01	0.34	0.38	1.00	
VIETNAM	0.24	0.53*	0.21	0.44	-0.06	0.30	0.07	0.52*	1.00

* indicates correlation is significant at 5% level .

** indicates correlation is significant at 10% level .

Table 7
Correlation of Monetary Shock among ASEAN Countries

	<i>CAM</i>	<i>IND</i>	<i>LAO</i>	<i>MIA</i>	<i>MYN</i>	<i>PHP</i>	<i>SGP</i>	<i>THL</i>	<i>VTM</i>
CAMBODIA	1.00								
INDONESIA	0.86*	1.00							
LAOS	0.38	0.31	1.00						
MALAYSIA	-0.21	0.20	-0.68	1.00					
MYANMAR	0.50**	0.01	0.44	-0.88	1.00				
PHILIPPINES	-0.08	0.38	0.37	0.39	-0.66	1.00			
SINGAPORE	-0.52	-0.04	0.06	0.52*	-0.85	0.89*	1.00		
THAILAND	0.80*	0.48	0.74*	-0.75	0.84*	-0.20	-0.59	1.00	
VIETNAM	0.95*	0.97*	0.45**	-0.04	0.25	0.25	-0.21	0.68*	1.00

* indicates correlation is significant at 5% level .

** indicates correlation is significant at 10% level .

CONCLUSION

This paper examined the feasibility of an OCA for ASEAN 9. For successful initiation of a monetary union, preconditions such as synchronous business cycles, similarity in inflation levels and policy congruence are to be met. Using annual data over 15 years for 9 countries, real GDP growth and inflation rate correlation analysis have been made. Although there is less obvious pattern in real GDP growth, inflation is significantly correlated among most ASEAN countries except the pair of Cambodia and Myanmar with Singapore.

The results from SVAR analysis have shown the absence of ASEAN OCA as a whole. In terms of supply shock, Myanmar, Laos and Cambodia show no significant correlations with other ASEAN economies except Vietnam. On the other hand, results show that there are more demand shocks correlation among the ASEAN economies. Cambodia, Malaysia, Philippines, and Vietnam appear to respond positively and significantly to demand shocks. Monetary shocks appear to be more correlated than supply or demand shocks in ASEAN, especially between

Cambodia and Vietnam with other ASEAN members. Therefore, it can be concluded that the four ASEAN countries of Malaysia, Philippines, Singapore and Thailand, with exception of Indonesia, are still strongly correlated. Vietnam, as expected, is catching up with Cambodia not far behind, where both countries can be paired up to form another sub group.

Based on the above identified sub groups, Malaysia, Singapore and Thailand should be a good starter for monetary union for ASEAN. Agarwal, Penm, Wong and Martin (2004) have proposed the “ASEAN Dollar” as a common currency for the establishment of ASEAN Economic and Currency Community (AECC) for a stronger economic growth for the ASEAN region. They also have suggested Malaysia to be a prime experimental country for the ASEAN dollar. Singapore’s involvement is a must, as its monetary institutions are strong, particularly the DBS bank, one of the largest banks in ASEAN, can serve as the anchor bank for monetary union . This is similar to the role of Bundesbank, Germany in the European System of Central Banks (ESCB).

However, it is to be mentioned here that political commitment from governments are essential, apart from symmetry of shocks among countries and sufficient economics preparation work for OCA. If political drive to move forward in each of the member country is relatively low, this shall be the major stumbling block of monetary union.

NOTES

1. 11 countries that first adopted Euro are Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Spain, collectively known as the Eurozone/ Euroland.
2. In total, Euro is the official currency in 31 states and territories. Also, 27 states and territories that have a national currency pegged to the Euro.
3. Recent Developments in ASEAN Economic Integration, ASEAN Secretariat, 1999, Jakarta at <http://www.aseansec.org/7661.htm>
4. ASEAN+3 nations are all 10 ASEAN countries: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam , plus China, Korea and Japan.
5. ASEAN 9 are all ASEAN countries except Brunei (as data for Brunei is not available).
6. Peripheral ASEAN countries refer to Cambodia (1999), Laos (1997), Myanmar (1997) and Vietnam (1995). The dates in brackets are joining date to ASEAN.
7. www.imfstatistics.org
8. Fisher’s Z transformation is used to calculate the significance of the correlation coefficient. If the Z statistic is greater than the critical value it means that correlation is significantly different from zero. The sample size used in this analysis is 15, therefore critical value at 5% is 0.5659, while at 10% is 0.4749.

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