The Case for Monetary Union in East Asia: From Theory to Empirics

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Abstract

Among others, this paper presents the case for fixed exchange rates and monetary union in East Asia, the underlying motivation behind the rising interest on optimum currency areas (OCAs) in the Asian context. The paper also explicitly proposes the dollar as the monetary anchor. Twenty empirical papers in 1994–2009 are reviewed and the five original members of ASEAN have been commonly indicated to be sufficiently homogenous for monetary unification. Some other common threads can be also observed. First, recent considerations could have played a more important role than the traditional theory in the selection of country samples for analysis. Second, unlike the early intellectual work which had been molded by the debate on adjustment mechanisms, current empirical literature has been driven largely by the enthusiasm to identify homogenous economies. Third, there is a reason to believe that little has been done in light of the endogeneity view of OCA criteria. Finally, an explicit monetary anchor, particularly the dollar anchor, has scarcely been set a priori in empirical analyses.

Keywords: optimum currency areas; Asia; business cycle; integration; dollar; ASEAN.
1. Introduction

In the interwar years, the difficulties of reinstating the gold standard and the disruptive shock of the Great Depression had prompted a wide-ranging debate on the international monetary system in the West. Today, the birth of euro and the Asian financial crisis were among the drivers which had spurred the proliferation of the intellectual work on monetary arrangement in the context of East Asia.

The theory of optimum currency areas (OCAs) has advanced only minimally since the seminal contributions of Mundell (1961), McKinnon (1963), and Kenen (1969). It remains difficult to move from theory to empirical work and policy analysis.

Bayoumi and Eichengreen (1997, p.762)

Nevertheless, as the above statement vividly points out, it has remained difficult to operationalize the intellectual work to practical grounds given the complexities found in the real world. In spite of this, numerous empirical studies have attempted to demystify the theory in an effort to identify groups of economies which could possibly come together under one common monetary umbrella.

Against this backdrop, the present paper seeks to present the reasons why the idea of Asian monetary union has gained increasing popularity despite of the obstacle highlighted. The paper also provides the arguments for dollar as the monetary anchor. Finally, it reviews 20 relevant
empirical works in 1994–2009 to discover some underlying common threads in them.

Among other findings, the five original ASEAN member countries have been indicated in general to constitute a monetary union. Viewed in this light, policymakers of the original ASEAN members may need to further foster political and economic integration to reap the benefits of a single monetary zone. Meantime, business managers may need to tune their regional decisions based on the fact that macroeconomic circumstances in the region are highly symmetrical.

The remainder of the paper is structured as follows. Section 2 revisits the essence of the classical work on OCA. Section 3 explains the case against flexible exchange rates for East Asia. Section 4 details the case for monetary union in the region. Section 5 presents the case for US dollar as the monetary anchor. Section 6 provides the review of empirical studies and section 7 discusses relevant interpretations and concludes.

2. The theory of optimum currency areas

In the classic published in 1961, Robert Mundell proposed that an optimal currency area is characterized by internal factor mobility and external factor immobility. Succinctly, interregional and interindustrial factor mobility can substitute for changes in nominal exchange rates to restore internal and external equilibriums when asymmetric shocks occur between economic regions. The equilibriums pertain to maintenance of full employment, stable price levels, and balanced international payments.

Based on the presumption that perfect labor mobility hardly prevails, Kenen (1969) provided an alternative to define optimality. He argued that well-diversified economies are more able to cope with asymmetric shocks between members in a monetary union and are therefore
more feasible candidates to be part of the union. Another dimension for optimality came from McKinnon (1963) in which he contended that highly open economies are least feasible for flexible exchange rates whereas exchange rate fixation with a putative currency is highly desirable.

In the presence of liberal capital movements, a sustainable monetary bloc entails irrevocably fixed exchange rates; full and irreversible convertibility of currencies; financial market integration; liberalized movements on current transactions; common monetary policy; and harmonization of national financial regulations and structures of institutions (see e.g. Tavlas, 1993).

3. The case against flexible exchange rate

The fundamental argument raised by Milton Friedman in his 1953 classic for allowing exchange rate to float lies in the ability of floating rate to ease the process of adjustment to external shocks. Suppose the demand for exports of a country falls, necessitating a fall in relative prices of goods and labor to correct the deficit—it will be easier for the change in terms of trade be accomplished through depreciation or devaluation rather than through some combinations of inflation in the foreign country and unemployment in the home country.

Nonetheless, attempts to increase competitiveness by devaluations would only lead to inflation and retaliations (see McKinnon, 1963; Krugman, 1990). In highly open economies, domestic prices and wages are most likely closely linked to exchange rates of significant trading partners, rendering devaluations or depreciations ineffective in restoring external balance; the net result is more inflation. Also, devaluation is useless and might even be detrimental when a shock comes from the capital account, as when emerging markets are hit by contagion and face sharply

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1 Though Friedman has always been portrayed as a strong advocate for floating rates, he has actually had no objections for hard fixed rates (Hanke, 2008).
higher interest rates; the Latin American and the Indonesian experience had been contractionary irrespective of the degree of devaluation (Calvo, 2002).

In light of the above, for economies which have been integrated in respect of trade and international capital flows, which define most of East Asia today, flexible rates are most probably undesirable. In fact, the sharp fluctuations in the yen-dollar rate, coupled with pseudo-fixed or soft pegs and incompetent monetary policies were the main culprit behind the Asian crisis. Thus, the foregoing of independent monetary policy and floating rate is likely to be beneficial to developing countries (Calvo and Reinhart, 2002). Even Japan, an advanced economy, is not spared from the devastating effects from floating rates. The Japanese banking system was the casualty of excessive appreciation of the yen between 1985 and 1995 (Mundell, 2003).

4. The case for monetary union

The primary case in favor of exchange rate fixation against a pivotal currency rests upon the desirability of certainty (Krugman, 1990). By fixing participants’ currency values against a hard currency, the resulted system will confer a degree of stability between the participants and the numéraire country, as well as between the participants, as enjoyed by the ever-expanding EMU. As a matter of fact, the Euro club contains 16 members since Slovakia adopted the Euro on January 1, 2009. The following discussion highlights the case for an Asian monetary union which generally underlies the motivation for extensive studies in the area.

Greater integration

Tighter economic integration in East Asia is ever warranted in the face of rising regional integration elsewhere such as NAFTA, EU, Mercosur, CEMAC\textsuperscript{1}, OECS\textsuperscript{2}, UEMOA\textsuperscript{3}, and
To an extent, these arrangements have brought intra-regional stability but more competition between trade blocs and more volatility between major currencies.

Along these lines, East Asia may need to further enhance its intra-regional trade to insulate against disturbances originating from outside the region. Recent free trade deals have encompassed ASEAN, China, Japan, India, Australia, and New Zealand which cover aspects of goods, services, investments, and intellectual property. Trade liberalization and economic integration often require stable exchange rates; otherwise, regional free trade agreements could be undermined by compensatory tariffs demanded by exporters in stable countries against countries that might devalue their currencies (Ngiam and Yuen, 2001).

Moreover, a monetary union which encourages trade and economic integration constitutes a virtuous self-reinforcing circle (Bayoumi and Eichengreen, 1997). Since EMU was established, trade and investment have grown tremendously. The same is true for the case of dollarization, an effective monetary union with the US, which has raised trade, investment, and economic growth significantly (Alesina and Barro, 2001).

Highly open economies would gain much if exchange rates are fixed. When initial trade is large, the size of required price and wage adjustments to accommodate any given external shock will be small (Krugman, 1990). With initial exports of 20 percent of GNP, a one percent deficit (of GNP) would require less fall in prices and wages than if the initial exports were one percent. Even when initial trade is low, the gains from fixed rates could also be high (Alesina, Barro, and Tenreyro, 2002). Since low initial trade could be due to high trading costs, the trade that did occur must have high marginal values— coupled with lower marginal costs when exchange rates are fixed, higher marginal gains will result.

The benefits are especially important to the highly heterogeneous economic structure of
East Asia. All the while, MNCs operating in the region have to diversify their production processes and stages of production across countries to exploit comparative advantages (Ramos, 1994). Examples are the tourism and electronics industries which are highly concentrated in the growth triangles (GTs), subregional economic zones which were set up to foster economic complementation. The leading GTs are the Indonesia-Malaysia-Singapore Triangle (IMS-GT); the East ASEAN Growth Area (EAGA) covering Brunei and parts of Malaysia, Philippines, and Indonesia; a growth zone linking parts of Myanmar, Laos, Thailand, and China; and the southern Chinese Economic Triangle, made up of China, Hong Kong, and Taiwan.

A bolstered economic integration from a firm monetary union will also preclude any undesirable beggar-thy-neighbor policies. Even the implicit dollar peg (or pseudo-exchange rate union) adopted by the Asian economies prior to the Asian crisis had actually insulated each other from harmful depreciations (McKinnon, 2005).

Lower costs

A currency area enhances the role of money as unit of account by setting economies of scale into play and reduces transaction costs, including the costs of information, search, exchange, hedging, and calculation (see Tavlas, 1993). Small economies, including the less developed economies in Indo-China in East Asia, should benefit the most from the unit of account, means of payment, and store of value services provided by a major currency (see Bayoumi and Eichengreen, 1997). Indeed, the US dollar has been commonly accepted in Vietnam and its neighboring countries since the Vietnam War.

A credible monetary union anchored on a stable currency will also lead to lower cost of capital. Since the uncertainty arisen from currency risk and sudden regime change is removed in this arrangement, the cost of international and hence domestic borrowing becomes lower (see
McKinnon 2005; Chang, 2000). In addition, the improved allocational efficiency of financing process in a monetary bloc does provide both borrowers and lenders a broader spectrum of financial instruments, thereby enabling more efficient choices to be made in terms of duration and risk (Robson, 1987).

Lower cost of capital also stems from lower reserve requirement when enlargement of foreign exchange market in a monetary bloc removes volatility of exchange rates and ability of speculators to influence money prices (see Tavlas, 1993). Moreover, if countries are structurally diverse, like those in East Asia, reserves for intra-area transactions too may be substantially reduced because any payments imbalances may be offsetting.

Price stability

A monetary standard based on a credible currency also helps in curbing inflation in several ways (see Tavlas, 1993). First, with respect to inflation targeting, exchange-rate targeting is better than monetary-growth targeting because exchange rates are highly observable. Second, any high inflation country which joins a low inflation monetary bloc can ‘import’ low inflation reputation without loss of output and employment. The recent past has seen establishments of currency board intended to import monetary policy credibility from a stable developed country (Oomes and Meissner, 2008). Third, internal monetary policy can be removed from politically dependent domestic authorities and delegate it to a more independent foreign authority.

Countries with currency boards (e.g., Argentina, Estonia, Lithuania, and Bulgaria) have experienced lower inflation and higher growth than those with other regimes (Guide, Kähkönen, and Keller, 2000). Comparable results could be found in dollarized countries too (see e.g., Chang, 2000).

Inflation reduction is also important to less developed countries in East Asia. In general,
the degree of monetary authority independence from the executive branch in these countries is
far lower than those in the advanced countries, which partly explains why internal monetary
policies in small countries are relatively unstable. Based on IMF data, average CPI inflation in
Vietnam, Laos, and Indonesia for 2001–2007 is about 4-6 percent higher than the US level while
Myanmar’s rate is about 24 percent higher. Since there is no permanent Phillips curve trade-off
(see Tavlas, 1993), high inflation countries have little to lose in the long run and much to gain by
adopting monetary policy of a stable country.

Financial stability

A stable domestic currency against the denominator of liabilities is utmost crucial in times of
distress where speculative capital flows could easily deplete foreign reserves even among
neighboring countries that are marginally leveraged (Rogoff 2005). Given that many developing
countries in East Asia are still substantially indebted in hard currencies especially in dollars
(Calvo, 2002; McKinnon, 2005), any steep depreciations would certainly render them insolvent.
The Thai experience during the Asian crisis is a very good instance. This can be precluded if a
firm peg against the denominator of debt is adopted in a monetary union.

Though IMF usually advises countries to float their exchange rates in face of domestic
crises, emerging middle-income economies are held back by the so-called “fear of floating”
dilemma (see e.g., Calvo and Reinhart, 2002). At least two interlocking factors underlie this fear.
First, emerging economies do not have well-developed and diversified financial systems which
are able to minimize real sector disruptions resulted from transitory exchange rate variations
which made them not able to borrow overseas in their domestic currencies, commonly referred to
as “original sin”. Second, policymakers in emerging markets suffer from a chronic lack of
credibility. As a result, an emerging economy might experience large and frequent shocks to exchange rate expectations or to interest rate risk premiums.

Labor mobility

According to Mundell (1961), the costs of sacrificing the use of exchange rate changes would be minimal if there is mobility or flexibility of the labor markets in geographical and industrial dimensions within a currency area. Alternatively, if labor markets are flexible, real wages can adjust to restore internal and external balances. The following evidence suggests that labor markets in East Asia may be sufficiently mobile or flexible to withstand asymmetric disturbances that may arise in a monetary union.

Asis and Piper (2008) discovered that much of international migration in Asia is intra-regional, undocumented, well developed, and well connected. Since early 2000s, the world's largest net labor exporting country is the Philippines. Other main exporters include Indonesia, India, China, Vietnam, Myanmar, Cambodia, and Laos. The common destinations for them are Middle East, Malaysia, and Thailand. Net labor importing countries include Japan, Hong Kong, Taiwan, Korea, Singapore, Brunei, Malaysia, and Thailand, which draw workers from the less developed countries in the region. Notably, China allowed labor export mostly in connection with state contracted projects overseas since the 1978 market reform but international migration has been eclipsed by the much larger internal rural-to-urban migration.

At the same time, Athukorala (2006) found that the number of migrant workers per 1,000 of labor force has increased significantly from 1980s to early 2000s in Japan, Korea, Taiwan, Hong Kong, Singapore, Malaysia, and Thailand. The number has continued to rise in Malaysia and Korea despite the Asian crisis and in Japan in spite of its decade-long recession. Indeed,
intra-Asian labor migration had increased approximately from 1 million in the beginning of 1980s to 6.5 million in 2002 (Huang and Guo, 2006). One possible reason would be the establishment of ASEAN Occupational Safety and Health Network in 2001.

Eichengreen and Bayoumi (1999) have even indicated that labor mobility in East Asia was higher than that in Western Europe during the 1980s and 1990s. In 1999, the year the euro was adopted ten countries in Western Europe had some kind of minimum wage policy whereas only four East Asian economies had that kind of policy, suggesting that Asian wages could be relatively easily adjusted to clear the labor market (Ngiam and Yuen, 2001). For that year, the unemployment rates in East Asia were also lower than those in Western Europe.

5. The case for US dollar as the anchor

The big news last week was a speech by Zhou Xiaochuan, the governor of China’s central bank, calling for a new “super-sovereign reserve currency”…

But they are, apparently, worried about the fact that around 70 percent of those (the China’s) assets are dollar-denominated, so any future fall in the dollar would mean a big capital loss for China.

(Krugman, 2009)

The above excerpt is from Paul Krugman’s New York Times column published in April, 2009. Notwithstanding the “flaw” in the US monetary policy and financial sector, the article asserted that the dollar would remain robust in view of the fact that any dollar dumping by China would set downward pressures on the dollar, leading to huge capital loss for the republic. This is clearly reflected in Table 1 which exhibits the currency composition of official currency reserves in the world and in the emerging and developing economies. Despite its declining share, the US
dollar is still the most dominant reserve currency till 2008.

Several other factors also make the US dollar the ideal monetary anchor. First, as widely recognized, the dollar is the vehicle currency for transactions across the world, particularly those pertaining to primary products (McKinnon, 2005). In East Asia, the dollar is also the preferred invoice currency even though Japanese trade is as large as the American one (McKinnon, 2005).

Second, the US is the most important export destination for most East Asian countries. Based on 1990–2002 data, Kawai and Takagi (2005) showed that the US was by far the most important industrial-country destination for Cambodia, the Philippines, Taiwan, Hong Kong, Thailand, Korea, Malaysia, China, and Singapore. Based on direction of trade data from IMF for 2001-2007, total trade with US is higher than that with Japan for China, Hong Kong, Korea, Cambodia, Malaysia, the Philippines, Singapore, Vietnam, India, and Macau. Other than direct

### Table 1

| Currency Composition of Official Foreign Exchange Reserves (Percent) |
|---------------------------------------------------------------|
| World                                                          |
| ![Currency Composition](currency_composition.png)              |
| Emerging and developing economies                             |

Source: IMF (2009).
relationship with US, trade with dollar bloc countries in Asia Pacific plays a role too. The ‘excess’ stability of East Asian currencies against the US dollar beyond that explained by bilateral linkage could actually be accounted for by the importance of trade with other countries in the dollar bloc (Kawai and Motonishi, 2005).

Third, the importance of dollar can also be recognized by looking at the regional breakdown of FDI inflows into the region (see Kawai and Takagi, 2005). For newly industrialized economies (Hong Kong, Korea, Taiwan, and Singapore), about 23 percent of total FDI inflows during 1990–2002 came from the US, about 15 percent from the EU, and about 14 percent from Japan. For ASEAN (excluding Singapore), 22 percent of the inflows came from Japan, while 18 percent and 16 percent came from EU and the US respectively. In China, the US accounted for 10 percent of the total FDI inflows, while EU and Japan accounted for 8 percent and 6 percent respectively.

Fourth, soft dollar pegs are still strong and prevalent in East Asia (McKinnon, 2005) and in India (Patnaik and Shah, 2008) in spite of the Asian crisis. Many still opt to maintain their soft dollar pegs because any dollar depreciation will reduce the value of their dollar-denominated assets and increase the value of outstanding debt payments whereas any revaluation would impede their export competitiveness—an impasse duly labeled as “conflicted virtue”. Moreover, when a large number of countries are pegging to a currency, it becomes difficult to break out of this pattern (Oomes and Meissner, 2008).

Fifth, the dollar is also the ‘safe-haven’ currency into which nationals in emerging markets fly in the face of a domestic financial crisis (McKinnon, 2005). Even when the Fed had been underperforming during the inflationary 1970s and early 1980s, and in the recent global financial crisis, the dollar-based system proved surprisingly resilient.
Lastly, other candidate currencies may not be suitable enough to serve as the monetary anchor for East Asia. Though Japan’s influence in the region is undeniably significant, due to some considerations, the Japanese yen may not be the ideal numéraire.

First, Japan has been facing internal macroeconomic and banking problems and its yen had been very unstable against the dollar in 1985–1995 (Mundell, 2003). Second, because a large part of Japanese trade is invoiced in dollars, any changes in the yen-dollar rate would be passed through to domestic yen prices. This makes the Japanese domestic price levels vulnerable to exchange rate fluctuations. Third, besides the declining dependence on Japan, the economic structures and real business cycles in major Asian economies were significantly different from those in Japan (see Chow and Kim, 2003; Shirono, 2009). Finally, as shown in Table 1, the importance of the Japanese yen in official foreign reserves has actually been diminishing.

What about the Chinese renminbi as the anchor? At present, the Chinese currency is not convertible on capital account, and its financial system is not well developed (Mundell, 2003). Moreover, the region's power rivalry between Japan and China still makes the dollar the currency of choice in the medium term future (Katada, 2008).

Despite all the above, the most devastating threat to an Asian dollar bloc, however, is the floating yen-dollar rate which may be chaotic when it swings sharply. However, should Japan is also a part of the dollar bloc, this setback virtually disappears.

6. Empirical review

Twenty empirical papers dated 1994–2009 are reviewed here. The studies can be categorized into those which use dataset prior to the Asian crisis in which the region was experiencing remarkable growth (pre-1997 dataset), those which also include the crisis period (pre-2000 dataset), and those which extend the dataset till the post-crisis period (pre-2008) but before the
2008 global financial crisis. In general, these studies seek to identify homogenous countries for integration. Only relevant results from main analyses are abstracted.

Pre-1997 dataset

In their 1994 much celebrated piece, Bayoumi and Eichengreen (B-E) compared 9 East Asian countries to Western Europe. 1969–1989 data and Blanchard-Quah (B-Q) extraction technique were used to extract and quantify demand and supply shocks that affect a country’s economy. Based on significant correlations and rapid responses to the shocks, they concluded that two country subsets came even closer to being OCAs: (1) Japan-Korea-Taiwan and (2) Hong Kong-Indonesia-Malaysia-Singapore-Thailand.

Later in 1999, Eichengreen and Bayoumi complemented their earlier results by regressing bilateral exchange rate volatility on relative output variability, dissimilarity of export composition, strength of bilateral trade, and economic size. Time period of 1976–1995 and 8 Asian countries were examined. Three country groups displayed significant correlations in exchange rate variability which were comparable to the European ones: (1) Singapore-Malaysia, (2) Singapore-Thailand, and (3) Singapore-Hong Kong-Taiwan. In another study, Loayza, Lopez, and Ubide (2001) utilized 1970–1994 data of 7 Asian economies to present evidence from an error components model. The shock dimensions examined were country-specific, sector-specific, and common shocks. The study discovered significant short-run and long-run co-movements of shocks that were comparable to the European ones in (1) Japan-Korea-Singapore-Taiwan and (2) Indonesia-Malaysia-Thailand.

Pre-2000 dataset

In 2000, Yuen examined GDP, real growth, inflation, interest rates, domestic investment, value-
added in agriculture, and value-added in services using hierarchical clustering and 1990–1997 data among Asia Pacific economies of which 9 of them are Asian. The results suggested five country groups: (1) Japan-Australia-New Zealand-US; (2) Korea-Malaysia-Thailand; (3) Indonesia-Philippines; (4) Hong Kong-Singapore; and (5) China.

In 2001, Bayoumi and Mauro updated the earlier B-E work with a larger dataset of 1968–1998 which involves the crisis period. As before, 9 Asian countries were examined. Though the size of disturbances in East Asia was larger than that in EMU, two country sets displayed faster speed of adjustment from supply shocks: (1) Hong Kong-Indonesia-Malaysia-Singapore and (2) Philippines-Thailand. Adopting B-E methodology also, Ngiam and Yuen (2001) used 1967–1997 dataset and included 9 countries. The study however did not use impulse response function and EMU as benchmark. They proposed three plausible pairs for monetary union: (1) Brunei-Singapore-Malaysia, (2) Japan-Korea, and (3) Taiwan-Hong Kong.

Using 1978–1999 data and a dynamic factor model on 10 Asian economies, Lee, Park, and Shin (2004) discovered that the Asian region’s common shocks in the 1990s were at least comparable to those in Europe. In particular, Indonesia, Korea, Malaysia, Thailand, and the Philippines shared higher degree of regional output co-movements. In 2005, Kawai and Takagi applied a variation of SVAR model to study the impulse response patterns of real GDP and price to exchange rate depreciations among 9 Asian economies. Time period used is 1970–1998. Symmetry of response pattern in real GDP could be found in (1) China-Hong Kong-Singapore-Taiwan and (2) Indonesia-Korea-Philippines-Thailand. With respect to symmetric response pattern in price, the symmetric groups were: (1) China-Hong-Kong-Singapore-Taiwan-Korea and (2) Indonesia-Malaysia-Philippines.
Pre-2008 dataset

Stretching the time period to cover the post-crisis Asia, Kawai and Motonishi (2005) used 1980–2002 data of 11 Asian economies to demonstrate that growth rates of real GDP, real personal consumption, and real fixed investment were highly correlated between Japan, Korea, Taiwan, Singapore, Malaysia, and Thailand, and perhaps also Indonesia and the Philippines.

Font-Vilalta and Costa-Font (2006) set Japan as the monetary anchor for 5 East Asian countries. In this correlation-based paper which utilized 1963–2001 data, the authors examined synchronization of exchange rates, business cycles, interest rates, exports, and imports. A multi-period analysis across 1963–1979, 1980–1997, and 1997–2001 was carried out. Only Singapore and Korea were found to experience increasing synchronization in the dimensions studied.

Complementing VAR approach with generalized purchasing power parity (GPPP) model and using real exchange rates with Japan as the basis, Ahn, Kim, and Chang (2006) managed to find ASEAN 4 (Indonesia, Malaysia, Singapore, and Thailand), Hong Kong, Korea, and Taiwan to display significant symmetrical response to supply shocks in terms of magnitude and speed of adjustment. Also, ASEAN 4, Hong Kong, Korea, Taiwan, and Japan were shown to share common trends in real exchange rate movement. Time periods used were 1960–2002 (SVAR) and 1970–2003 (GPPP) and 10 Asian countries were studied.

Using 1970–2002 data of 9 Asian economies and 1979–1998 EMU data as benchmark, Huang and Guo (2006) also found Hong Kong, Indonesia, Korea, Malaysia, Singapore, and Thailand to be viable candidates. A four-variable SVAR model was developed to extract external supply, domestic supply, demand, and monetary shocks. Sato and Zhang (2006) employed 1978–2004 Asian data and 1980–1997 EMU data as benchmark to assess real output co-movements of 8 Asian economies with cointegration test. The analysis also employed Vahid test to examine for
long-run relationships and Engle tests to check for short-run interactions in real outputs. Short-run common business cycles were found in (1) Singapore-Thailand-Indonesia, and in (2) Hong Kong-Korea-China, as well as between (3) Japan and Taiwan.

Based on fuzzy cluster analysis, Nguyen (2007) detected a divergence in the post-crisis East Asia. The time periods involved are: 1990–1996, 1990–2000, 1999–2003, and 1990–2003. From 10 economies considered, only the Singapore-Malaysia grouping could weather all the periods. The criteria used are: symmetry of business cycles, volatility of real exchange rate, degree of openness to regional trade, inflation differential from the regional average, and level of export diversification. No reference country is assigned.

Rana (2007) provided simple 10-year moving correlations between real GDP growth of 11 Asian countries and the group as a whole from 1989 to 2005. Correlations had been converging towards very high levels in (1) the Philippines, Indonesia, Japan, Malaysia, and Thailand. They were, however, a bit lower in (2) Laos, China, Singapore, and Vietnam.

Bacha (2008) examined 12 East Asian economies using SVAR and correlation analysis. Time period used is 1970–2003. For the SVAR analysis, the paper examined the interrelationship among the real GDP growth rates and countries’ response to external shocks. For the correlation analysis, the study looked into similarity of inflation, trade relationships, similarity in business cycles, and extent of policy congruence. The results from both techniques indicated four potential country pairs: (1) Malaysia-Singapore, (2) Japan-Korea, (3) Indonesia-Thailand, and (4) Australia-New Zealand.

In 2008 also, Ibrahim utilized hierarchical and fuzzy clustering methods on 7 Asian countries using OCA criteria and ‘adjusted’ Maastricht criteria. Results from pre-crisis (1991–1997) and post-crisis (1998–2004) periods are compared. Japan is set as the reference country.
The OCA criteria used are volatility in real GDP, volatility in real exchange rate, volatility in interest rate, trade openness, and convergence of inflation. The adjusted Maastricht criteria are budget deficit/GDP, external debt/GDP, exchange rate volatility, inflation differential, and annual prime lending rate. Results for pre-crisis period indicated groupings of Indonesia-Philippines and Malaysia-Thailand-Korea. Meanwhile, post-crisis OCA results suggested groupings of Malaysia-Philippines-Thailand-Korea whereas post-crisis Maastricht results indicated groupings of Malaysia-Philippines-Thailand and Singapore-Korea-China.

Another support came from Kawai (2008) who discussed how regional integration has been proceeding in trade, FDI, and other activities; exchange rate arrangements in Asia; possible unwinding of global payments imbalances and surges in capital inflows; and challenges for monetary coordination. Period studied is 1989–2003. Comparisons to post-euro EMU were made. From 10 economies examined, those which were sufficiently integrated were (1) Japan-Korea, (2) China-Hong Kong, and (3) Singapore-Malaysia-Brunei.

More recently, Sato, Zhang, and Allen (2009) managed to identify two prospective groups: (1) US-Taiwan-Hong Kong-Singapore and (2) Thailand-Malaysia-Singapore-Philippines-Indonesia-Japan. The study employed Johansen cointegration to check for long-run co-movements of real outputs. Data series were 1978–2006 and were seasonally adjusted using Census X-12 method. Ten Asian countries were sampled. Interestingly, the ASEAN countries were prospective only when Japan was included.

Quah (2009) compared the values of the OCA dimensions, namely inflation convergence, export diversification, labor market flexibility, and external indebtedness of 17 Asian economies to those in EMU and dollarized countries. The anchor currency used is the US dollar. Dataset was segmented into 1980–1996, 1997–2000, and 2001–2007, which contain post-euroization and
post-dollarization periods. Results suggested that inflation rates and levels of export
diversification in Asia were comparable to those in dollarized economies; labor markets in the
region were at least as flexible as those in EMU; external debt levels in Asia have fallen
considerably in comparison to the dollarized countries, indicating reduced incentive to fix
exchange rates to the dollar; and the most prospective countries for a dollar bloc were India,
Thailand, and Malaysia.

7. Discussion and conclusion

Some common threads can be observed from the review. First, though the empirical papers have
used different methods, some common ‘groupings’ can still be found in many of the results.
Based on pre-1997-dataset results, two general groupings can be recognized: the Northeast
Japan-Korea-Taiwan group and the Southeast Thailand-Malaysia-Singapore-Indonesia group.
The pre-crisis (growth period) data appear to have generated groupings by level of economic
development, that is, the more developed Northeast group and the less developed Southeast
group.

For those using pre-2000 datasets, the “Asian Tigers” Taiwan-Hong Kong-Singapore
group, the ‘crisis’ Korea-Thailand group, and the Southeast Malaysia-Philippines-Indonesia
group can be detected. Obviously, the dataset which encompasses the pre-crisis and the crisis
period has produced the Asian Tigers group which has been robust during the crisis period, the
危机 group which has been severely distressed, and the Southeast group which has been
relatively less affected. When pre-2008 datasets are utilized, an ‘extended Southeast’ Korea-
Philippines-Thailand-Malaysia-Singapore-Indonesia grouping can be commonly found. It is
apparent that this group represents the countries which have been substantially impacted during
the crisis but have since rebounded significantly.
Despite the variations in the groupings, the original ASEAN members, Thailand, Malaysia, Singapore, Indonesia, and the Philippines, have appeared to be consistently indicated as prospective countries. With the expected benefits and the substantially flexible labor in these markets, there is a strong case for a monetary bloc centered on a stable anchor such as the dollar.

Nonetheless, this finding is not highly conclusive since selection bias could have contributed to the results. The fact that the number of countries included differs from one study to another study indicates that the sampled cases are varied. Among the studies, relevant Asian economies such as India, Vietnam, Macau, and Brunei have almost been neglected.

Some motivation could be behind this. In selecting the countries to examine, aside from data constraints, the authors could have been influenced by the notion that flexible exchange rates are undesirable to highly open (and small) economies. Hence, only highly open Asian economies such as ASEAN 5, Japan, Korea, etc., are given emphasis. What remains to be unclear, however, is the non-inclusion of Brunei in almost all the studies even though Brunei is a highly open small economy with total trade more than its GDP (see Kawai and Takagi, 2005). Of course Macau is also a highly open small economy. If Hong Kong, a China’s territory, can be treated as a separate entity in the studies, so does Macau.

Else, the authors could have been adhering to another facet of the traditional theory when selecting the countries. Consider this:

If a prevailing exchange rate regime, fixed or flexible, can maintain external balance without causing unemployment (or demand-induced wage inflation), that regime is optimal.

(Kenen, 1969, p. 41).
The excerpt above is an interpretation given by Peter Kenen on the definition of optimality implied by Mundell (1961). Hence, if an Asian country has already achieved those objectives with existing exchange regime, moving into a monetary union is not necessary. But then again, the reasons for including certain countries and not including the others are rarely made clear. Along these lines, it is not totally unfounded to conjecture that early theoretical views might have been overshadowed by current considerations\(^\text{11}\), such as the case for monetary union.

Secondly, while the early intellectual debate has been spurred by the fact that homogenous regions or countries hardly prevail and hence adjusting mechanisms such as factor mobility, product diversification, flexible exchange rates, etc., are needed to achieve the objectives of price stability, full employment, and external balance, the empirical literature appears to have always been on the search for homogeneous countries. There seems to be a consensus among the empirics that symmetrical countries are extremely important and can be identified in Asia so that adjustment mechanisms may be less needed. Nonetheless, as pointed out in Mongelli (2002), similarity of shocks has been argued strongly as not a strict pre-requisite for sharing a single currency if all members of a currency area are financially integrated and hold claims on each other’s output.\(^\text{12}\) In light of the above, the seminal Bayoumi and Eichengreen’s (1994) piece could have impinged an overwhelming influence which partly explains why symmetry in macroeconomic experience has gained so much popularity in the empirical works. Along these lines, current empirical literature could be regarded as the other side of the coin to the early theoretical debate.

Thirdly, those studies which used EMU as a metric for East Asia can be commended for bringing the theoretical grounds of OCA closer to pragmatic circumstances. Nonetheless, the
validity of the results could have been greatly enhanced if measures from the post-euro EMU are used in the comparative analyses between Asia and EMU, mitigating part of the endogeneity of OCA criteria argument (see Frankel and Rose, 1998). Suppose OCA criteria are indeed endogenous, that is, achieved only after monetary union is formed, using post-euro benchmarks would be much more appropriate than using pre-euro benchmarks. In this respect, studies done after euroization, those which used post-1999 Asian data (e.g. Huang and Guo, 2006; Sato and Zhang, 2006) have obvious advantage of using the post-euro data. Among the papers reviewed, however, only Rana (2007), Kawai (2008), and Quah (2009) have demonstrated this in a limited manner. It is not unfounded to say that little has been done in view of the endogeneity criticism.

Lastly, notwithstanding the obvious reasons for the dollar as the monetary anchor for East Asia, the dollar has nevertheless gained little attention among the empirics. Perhaps due to the ambiguity of a center economy in Asia (unlike in EU where Germany is commonly accepted as the center economy), a monetary anchor is rarely set a priori in the empirical studies.

In conclusion, policymakers of the original ASEAN members may really need to look into further political and economic integration in light of the extensive indication that ASEAN could feasibly constitute an optimal currency area. Specifically, the US dollar may be a very good numéraire currency. To regional business managers, the finding here may confirm the decisions which have been based on the homogeneity assumption of the ASEAN region. In another aspect, decision-makers may consider locate some of their operations outside of ASEAN to reap the advantages of diversification. Nonetheless, one must be aware of the “shortcomings” implied in the empirical literature that might undermine the validity of the result.

Unquestionably, the conclusions made here are limited in the sense that only 20 empirical papers dated 1994-2009 have been reviewed and hence may not necessarily reflect the studies in
the field at large.

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Endnotes

1 Economic and Monetary Community of Central Africa.
2 Organization of Eastern Caribbean States.
3 West African Economic and Monetary Union.
4 Central American Common Market.
5 To date, ASEAN contains Myanmar, Vietnam, Laos, Cambodia, and Brunei in addition to the original members of Thailand, Malaysia, Singapore, Indonesia, and the Philippines.
6 New currency boards have been implemented in Argentina, Bosnia and Herzegovina, Bulgaria, Djibouti, Estonia, and Lithuania. Examples of currency blocs in small economies are the Eastern Caribbean Currency Union and the CFA franc zone in Africa.
7 China, Malaysia, Cambodia, Laos, Myanmar, and Vietnam still maintained their dollar pegs in 2004 and 2005. Meanwhile, Singapore, Japan, Thailand, Korea, Indonesia, and the Philippines had about two-thirds of their currency basket weights on the dollar.
8 Since the days before the Asian crisis, most Asian economies had informally soft-pegged their currencies to the dollar, a move which made them vulnerable to the depreciating yen. However, dollar pegs were entirely rational from the perspective of Asian economies—to facilitate hedging by merchants and banks against exchange risks, and to help central banks anchor their domestic price levels. Nevertheless, since their dollar pegs were ‘soft’, the obvious Achilles heel was the vulnerability to one-way speculation which struck during the crisis. In contrary, if their exchange rates were securely locked to the dollar with credible regional arrangements, the system as a whole would definitely be durable.
9 Demand shocks were not examined in this paper as they were thought to be unlikely to be invariant to demand management policies and currency regimes.
10 Long-run purchasing power parity (PPP) implies that real exchange rates are stationary. A vast literature has, however, shown that they are nonstationary. This is because fundamental macroeconomic variables that determine real exchange rates are nonstationary. A system of nonstationary real exchange rates may have a long-run equilibrium path in common since the individual nations will experience a set of common real macroeconomic shocks. This is termed as GPPP hypothesis.
11 For instance, Font-Vilalta and Costa-Font (2006) selected the set of countries according to availability of data and affiliation to the Japanese economy. Clearly it is not based on whether the existing arrangement is not optimal or otherwise.
12 First, residents of a country can hold claims to output in other countries. Dividends, interests, and rental revenues from these claims will insure income as long as output is imperfectly correlated. Such ex-ante inter-regional insurance allows the smoothing of both temporary and permanent shocks. Second, a country’s residents can adjust their wealth portfolio in response to income fluctuations by buying and selling assets and by borrowing and lending on inter-regional, or international, credit markets. Such ex-post adjustment of asset portfolios allows for the smoothing of transitory shocks. This argument which was put forward by Robert Mundell can be found in Mongelli (2002).

References

Asis, M. M. B., & Piper, N. (2008). Researching international labor migration in Asia. *Sociological Quarterly, 49*(3), 423–444.
Alesina, A. F., Barro, R. J., & Tenreyro, S. (2002). Optimal currency areas. In M. Gertler & K. Rogoff (Eds.), *NBER macroeconomics annual*. Cambridge, MA: National Bureau of Economic Research.

Ahn, C., Kim, H-B., & Chang, D. (2006). Is East Asia fit for an optimum currency area? An assessment of the economic feasibility of a higher degree of monetary cooperation in East Asia. *Developing Economies, 44*(3), 288–305.

Athukorala, P. (2006). International labor migration in East Asia: Trends, patterns, and policy issues. *Asian-Pacific Economic Literature, 20*(1), 18–39.

Bacha, O. I. (2008). A common currency area for ASEAN? Issues and feasibility. *Applied Economics, 40*(4), 515–529.

Bayoumi, T., & Eichengreen, B. (1994). One money or many? Analyzing the prospects for monetary unification in various parts of the world. *Princeton Studies in International Finance, 76*, Princeton: International Finance Section, Princeton University.

Bayoumi, T., & Eichengreen, B. (1997). Ever closer to heaven? An optimum-currency-area index for European countries. *European Economic Review, 41*(3), 761–770.

Bayoumi, T., & Mauro, P. (2001). The suitability of ASEAN for a regional currency arrangement. *The World Economy, 24*(7), 933–954.

Calvo, G. A. (2002). On dollarization. *Economics of Transition, 10*(2), 393–403.

Calvo, G. A., & Reinhart, C. M. (2002). Fear of floating. *Quarterly Journal of Economics, 117*(2), 379–408.

Chang, R. (2000). Dollarization: A scorecard. *Economic Review 3rd Quarter*. Atlanta: Federal Reserve Bank of Atlanta.

Chow, H. K., & Kim, Y. (2003). A common currency peg in East Asia? Perspectives from Western Europe. *Journal of Macroeconomics, 25*, 331–50.

Eichengreen, B., & Bayoumi, T. (1999). Is Asia an optimum currency area? Can it become one? In S. Collignon, J. Pisani-Ferry, & Y. C. Park (Eds.), *Exchange rate policies in emerging Asian countries*. London: Routledge.

Font-Vilalta, M., & Costa-Font, J. (2006). A note on the feasibility of a monetary area in the East Asia. *Asia Europe Journal, 4*(1), 53–58.

Guide, A. M., Kähkönen, J., & Keller, P. (2000). *Pros and Cons of Currency Board Arrangements in the Lead-Up to EU Accession and Participation in the Euro Zone*. (IMF Policy Discussion Papers 00/1). International Monetary Fund.
Huang, Y., & Guo, F. (2006). Is currency union a feasible option in East Asia? A multivariate structural VAR approach. *Research in International Business and Finance, 20*(1), 77–94.

Ibrahim, S. (2008). A Study of Optimum Currency Area in East Asia: a Cluster Analysis. *Journal of Economic Integration, 23* (4), 765–790.

International Monetary Fund. (2009). *Currency Composition of Official Foreign Exchange Reserves (COFER).* Retrieved June 14, 2009, from http://www.imf.org/external/np/sta/cofer/eng/index.htm

Katada, S. N. (2008). From a supporter to a challenger? Japan's currency leadership in dollar-dominated East Asia. *Review of International Political Economy, 15*(3), 399-417.

Kawai, M. (2008). Toward a regional exchange rate regime in East Asia. *Pacific Economic Review, 13*(1), 83–103. Retrieved August 12, 2008, from Synergy Blackwell database.

Kawai, M., & Motonishi, T. (2005). Macroeconomic interdependence in East Asia: Empirical evidence and issues. In *Asian economic cooperation and integration progress, prospects and issues.* Manila: Asian Development Bank.

Kawai, M., & Takagi, S. (2005). Strategy for a regional exchange rate arrangement in East Asia: Analysis, review, and proposal. *Global Economic Review, 34*(1), 22–65.

Kenen, P. (1969). A theory of optimum currency areas: An eclectic view. In R. Mundell & A. Swoboda (eds.), *Monetary problems of the international economy.* Chicago: University of Chicago Press.

Krugman, P. R. (1990). Policy problems of a monetary union. In P. de Grauwe & L. Papademos (Eds.), *The European monetary system in the 1990s.* Harlow: Longman.

Krugman, P. R. (2009). *China’s Dollar Trap.* Retrieved April 6, 2008, from http://ww-w.nytimes.com/2009/04/03/opinion/03krugman.html?_r=1

Lee, J. W., Park, Y. C., & Shin, K. (2004). A currency union in East Asia. In Asian Development Bank, *Monetary and financial integration in East Asia: The road ahead* (pp. 139–175). Basingstoke: Palgrave.

Loayza, N., Lopez, H., & Ubide, A. (2001). Sectoral Macroeconomic Interdependence: Evidence for Latin America, East Asia, and Europe. *IMF Staff Papers, 48*(2), 367–396.

McKinnon, R. I. (1963). Optimum currency areas. *American Economic Review, 53,* 717–725.

McKinnon, R. I. (2005). *Exchange rates under the East Asian dollar standard: Living with Conflicted Virtue.* Cambridge, MA: MIT Press.
Mongelli, F.P. (2002) “New” Views on the Optimum Currency Area Theory: What is EMU telling us? (ECB Working Paper Series 138). European Central Bank.

Mundell, R. A. (1961). A theory of optimum currency areas. American Economic Review, 51, 657–664.

Mundell, R. A. (2003). Prospects for an Asian currency area. Journal of Asian Economics, 14, 1–10.

Ngiam, K. J., & Yuen, H. (2001). Monetary cooperation in East Asia: A way forward. The Singapore Economic Review, 46(2), 211–246.

Nguyen, T. (2007). East Asian Currency Area: A fuzzy clustering analysis of homogeneity (DEPOCEN Working Paper 10). Vietnam: Development and Policies Research Center.

Oomes, N., & Meissner, C. M. (2008). Why do countries peg the way they peg? The determinants of anchor currency choice (IMF Working Paper 08/132). Washington, D.C.: International Monetary Fund.

Patnaik, I. & Shah, A. (2008). Does the currency regime shape unhedged currency exposure (Working Paper 08/50). India: National Institute of Public Finance and Policy.

Quah, C. H. (2009). The feasibility of East Asian monetary union as an optimum currency area. International Journal of Asia Pacific Studies, 5(2), 65–90. Retrieved June 11, 2009, from http://www.usm.my/ijaps/default.asp?tag=-1&flag=5

Rana, P. B. (2007). Economic integration in East Asia: Trends, prospects, and a possible roadmap (Economic Growth Centre Working Paper Series 07/01). Nanyang Technological University.

Robson, P. (1987). The economics of international integration, London: Allen and Unwin.

Rogoff, K. S. (2005). Fiscal conservatism, exchange rate flexibility and the next generation of debt crises. Cato Journal, 25(1), 33–39.

Sato, K., & Zhang, Z. (2006). Real output co-movements in East Asia: Any evidence for a monetary union? World Economy, 29(12), 1671–1689.

Sato, K., Zhang, Z., & Allen, D. (2009). The suitability of a monetary union in East Asia: What does the cointegration approach tell? Mathematics and Computers in Simulation, 79(9), 2927-2937.

Shirono, K. (2009). Yen bloc or yuan bloc: An analysis of currency arrangements in East Asia (IMF Working Paper 09/03). Washington, D.C.: International Monetary Fund.

Tavlas, G. (1993). The ‘new’ theory of optimum currency areas. The World Economy, 16, 663–
Yuen, H. (2000). *A cluster-based approach for identifying East Asian economies: A foundation for monetary integration* (Department of Economics Working Paper Series). Singapore: National University of Singapore.