Monetary Union and the Other Alternatives for Asia-Pacific Region*

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In this paper optimal currency arrangements in Asia-Pacific region are analyzed from the viewpoint of stabilizing output given various random shocks. In terms of how the potential arrangements may insulate individual economies from external and shocks, the proposed currency union in Asia-Pacific did not yet gain strong support. It is generally agreed that its only advantage is to smooth the effect of local real shocks on the combined stability of involved economies. The status quo regime of continued floating exchange rates among those countries is regarded as the most feasible defense against real internal shocks and may be regarded as offering similar advantages with respect to external monetary shocks. On the other hand, using yen as anchor currency (hypothetical yennization) may be the best defense against real external shocks and internal monetary shocks.

INTRODUCTION

There is a new determination to map the road to closer monetary cooperation as a building bloc for eventual monetary union in Asia-Pacific. In this study we analytically assess the suitability of the Asian-Pacific economies for potential monetary integration, on the basis of their symmetry/asymmetry in macroeconomic disturbances (monetary and real shocks), as satisfying one of the preconditions for forming an optimum currency area.

Asian currency crisis (1997–1999) gave impetus for an important debate under way on the appropriate exchange rate regime for economies in Asia. At the end of September 1997, Japan proposed the creation of an Asian Monetary Fund (AMF). The largest part of the national contributions to the AMF would come from Japan, but also Hong Kong, Taiwan and Singapore were prepared to contribute, and it was envisaged to reach a total of 100 billion US dollars. In spite of support from the Asian countries, the Japanese proposal was blocked by the adverse reactions from the USA and from the IMF. A compromise was sought in the so-called Manila Framework, with a financing agreement that would supplement the IMF

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financing, but without the institutional component of the AMF. This Framework was developed by the Manila Framework Group in November 1997, which consists of 14 Asia-Pacific nations.

On May 6, 2000, during a meeting of the ASEAN+3 Finance Ministers, it was agreed to extend the ASEAN Swap Arrangement to all ASEAN member countries (ASEAN-10) and to China, Japan and South Korea. This agreement is known as the Chiang Mai Initiative (CMI)and it consists of a network of bilateral swap agreements (BSA) between the 13 countries. It should be noted however, that the amount of allocated swap funds was insufficient to cope with any potential major financial crisis in the future. Moreover, the use of the currencies of the countries involved in bilateral trade was seriously hampered since the BSA is only adopted by four ASEAN countries, whereas international traders prefer to use the dollar.

The CMI is also more complex than the BSA, due to the multitude of sometimes diverging provisions in the bilateral agreements. Also in order not to get the same adverse reaction from the USA and the IMF, the BSA is complementary to the IMF, as it was agreed with IMF that at most 10 percent. of a bilateral swap could be done without any link to the IMF, which evidently severely limits the efficiency of the BSA both in terms of timing and conditions attached to support. However, by doing so, the total amount which can be made available for support within ASEAN+3 by the BSA and the IMF is 10 billion US dollars. In June 2003, the central banks of Australia, China, Hong Kong, Indonesia, Japan, South Korea, Malaysia, New Zealand, the Philippines, Singapore and Thailand (the eleven members of the Executive's Meeting of East Asia Pacific Central Banks) announced the establishment of the Asian Bond Fund (ABF). It aims at managing a fund of approximately 1 billion US dollars, which will come from Asian and Pacific countries, and invest this fund in a basket of liquid dollar denominated Asian government bonds. The Bank for International Settlements's investment management unit, BIS Asset Management, will manage the ABF with teams based in its Representative Office for Asia and the Pacific and in the BIS head office. The ABF will facilitate the re-investment of a small portion of Asia's international reserves back into the region while at the same time aiding the development of regional capital markets.

The debate on monetary union has been accentuated not only by the Asian currency crisis but also by a perceived increase in volatility in the world economy. On the one side there are calls for maintaining floating exchange rates (Mussa (2000), while of the other, there are various forms of fixed exchange rate regimes being proposed (McKinnon (2000)), (Williamson (2000)). These range from a Yen bloc and Yuan-bloc to an Asian currency unit (ACU)

(Ogawa and Ito (2000)), or to various forms of basket pegs within each economy.

The issue whether groups and sub-groups of Asian countries could establish a common currency, is much debated in the academic literature, especially since the 1997 crisis, but in spite of some initiatives within ASEAN, hardly of relevance in actual regional politics. The academic discussion is intimately related to the question which, if any, countries in Asia can be considered as a group as an optimal currency area (OCA). Optimum currency area (OCA) theory is the mainstream theoretical framework for analyzing the structural economic factors that determine the net (positive or negative) effect of forming a currency area among countries.

Empirical tests based on OCA theory are therefore a good starting point for evaluating the objective economic conditions for monetary integration in Asia-Pacific. Although in the short run, political considerations, alongside other economic circumstances, might well condition or even impose exchange rate choices, OCA theory is particularly relevant in the medium and long run. The predictive power of OCA theory has been empirically demonstrated by authors like Bayoumi and Eichengreen (1998) and Papaioannou (2003). However, Cohen (1998) and others emphasize that the presence of a dominant economy committed to monetary integration and the presence of a network of trade and capital market linkages that make the cost of a inter-dependent monetary policy acceptable to all members are also two conditions *sine qua non* for successful monetary integration.

The empirical tests of the OCA conditions that are available for Asia Pacific Asia give a mixed picture. They do not provide a clear cut answer with regard to the course of an optimal exchange rate policies and, possibly, the formation of currency unions in the region in the near or farther future. According to Bayoumi and Mauro (1999), and Ng (2002), indicators of the degree of shock symmetry show that ASEAN members are less suited than those of the EU, a few years before the Maastricht Treaty, for forming a currency union as a deeper economic integration and a firm political commitment in the region are necessary pre-conditions. According to Ng, shocks in Southeast Asia are more strongly correlated than in the EU and external shocks are more strongly correlated than in NAFTA. Indonesia, Singapore and Malaysia show a relatively high degree of correlation of shocks. According to Cohen (2003), the lack of political integration and solidarity, necessary to sustain the needed degree of commitment, is the main obstacle to monetary integration. Sterner and Skoog (2003) analyze the degrees of openness, the degrees of product diversification, similarities of industrial structure, similarities of inflation rates, degrees of correlation of macro-economic variables for ASEAN-10. According to other studies – ASEAN does not appear to constitute a suitable ground for

the OCA. See Lafrance and St-Amant (1999), Mongelli (2002) or Horvath(2003).

Interestingly, the arguments on both sides of the debate are familiar from earlier debates going at least back to the "optimal currency area" literature originated by Mundell (1961). It is well known that it is difficult to make much headway on deciding which exchange rate regime a country should adopt without an empirical evaluation of the various alternatives. From the theory of exchange rate regimes, we conclude that the optimal exchange rate regime depends on a range of empirical features of economies (both the economic structure and the nature of shocks). The large body of evidence in Bryant et al (1993) for industrial economies demonstrates that not only is the theoretical choice of the optimal exchange rate regime ambiguous, but different empirical approaches generate different conclusions for the developed economies .

In the case of Asia-Pacific region, there has been little empirical research into the important questions of comparing the performance of different exchange regimes in an empirical framework. For example, Cheung and Yuen (2004) found evidence on synchronous output movements in the long run and common business cycles in China, Japan and Korea. According to these authors, the formation of a currency union in Northeast Asia would have net positive effects for the participating countries. They point however to a number of complications related to the implementation of such a currency union, such as the role of a regional dominant economy and the difference in development levels between its members, and the consequences for the macro-economic adjustment process. More empirical studies take a wider set of countries, comprising both East Asian countries and ASEAN member countries, as a starting point. Eichengreen and Bayoumi (1996), for example, conclude that East Asia satisfies the standard OCA criteria perhaps in higher degree than EU countries. As arguments against monetary integration, they see the lack of development of the domestic financial systems, and the lack of institutions and political will at the regional level. Similar methodologies but different variables and data sets are used by Yuen (2000), Trivisvanet (2001), Zhang et al. (2002) and Saxena (2003). Starting from a set of countries including ASEAN-5, Japan, Korea, Taiwan, Hong Kong, China, Australia and New Zealand, Yuen (2000) proposes a multi-speed strategy towards monetary integration.

Three sub-regional monetary unions could be formed in an initial phase: Japan/Korea, Taiwan/Hong Kong/China and Singapore/Malaysia/Brunei/Indonesia. Other countries could then join one of these unions, which could finally be integrated in a wider Asian monetary union. Trivisvavet (2001) considers a slightly reduced set with ASEAN-5, Japan, Korea and

Hong Kong as this group has characteristics of an OCA. An optimal scenario with gradualism would imply that the Southeast Asian countries, with the exception of Indonesia but possibly including Korea, form a monetary union, after which the other countries could join later. Zhang et al. (2002) find that the structural shocks affecting ASEAN-5, US, Japan, Korea, Taiwan, Hong Kong and China are less symmetric and have a larger size on average, compared to the EU, although the adjustment speed is faster. It is not excluded however that smaller subsets of countries might engage in processes of monetary integration. Saxena (2003), finally, finds that most of the countries comprised by ASEAN, Japan, Korea, China and India show positive correlations for supply disturbances and high labour mobility.

The countries concerned could also form a currency union around the yen, on the condition that the Yen-Dollar exchange rate can be stabilised. Goto (2003) uses principal component analysis of seven macro-economic variables for Indonesia, Korea, the Philippines, Singapore, Thailand and Japan. A relatively high degree of synchronization with Japanese variables is observed, which has dramatically increased since the 1990s. Indonesia, Korea, the Philippines, Singapore and Thailand might consider to form a monetary union around Japan.

It is conventionally assumed that the most compelling reason in favor of a common currency is the elimination of transaction costs and exchange risks. The stability of money could in turn promote intra-regional trade and investment flows. While a common currency delivers benefits to the participating economies, it also imposes costs, in particular, the loss of monetary autonomy in response to asymmetric country shocks. Thus, an important empirical question is the extent to which Asia-Pacific is a region where country specific (idiosyncratic) shocks predominate, or whether it is a region where shocks affect all countries in a fairly similar way.

Some economists are highly critical about the scope for a common currency arrangements in Asia-Pacific. Eichengreen and Bayoumi (1999), Bayoumi and Mauro (1999), Bayoumi, Eichengreen and Mauro (1999) and Mussa et al. (2000), for example, are dismissive of such arrangements in this region, particularly of the feasibility of monetary union. Similar methodologies but different variables and data sets are used by Yuen (2000), Trivisvanet (2001), Zhang et al. (2002) and Saxena (2003). On the other hand, Japanese economists appear less critical Goto and Hamada (1994); Ito, Ogawa and Sasaki (1998); Murase (2000); Ogawa and Ito (2000); Ogawa (2000); Kawai and Akiyama (2000); Kawai and Takagi (2000);Yoshino, Kaji and Suzuki (2000).

Since the end of Asian currency crisis there is a renewed focus on regional integration in trade and investment in the region. Under the umbrella of Asia Pacific Economic Cooperation's (APEC) Bogor declarations of an open trading and investment regime by 2010/20, there have been substantial developments in sub-regional integration and a number of proposals for free trade areas. The ASEAN Free Trade Area (AFTA) is now established and the Australia New Zealand Closer Economic Relationship (CER) is well advanced. Proposals for new free trade areas range from bilateral free trade areas – such as between Japan and Korea, Japan and Singapore, and New Zealand and Singapore – to larger free trade areas such as that between AFTA and CER. Japan proposed a collaboration agreement with ASEAN in 2002. The "Framework Agreement for Comprehensive Economic Partnership" between ASEAN and Japan was signed in October 2003 in Bali, Indonesia.

It is important to note that before its 2002 proposal, Japan seemed more inclined to follow the route of bilateral agreements. A bilateral agreement with Singapore had been signed in January 2002. Japan also integrated its bilateral agreements with the Framework Agreement for Comprehensive Economic Partnership (CEP). Negotiations about the specific articles in the CEP Agreement started in April 2005 and will be concluded in two years. Some ASEAN members are frustrated with ASEAN's slowness in building free trade frameworks and have been pursuing bilateral trade agreements during the last couple of years. Current situation seems to reflect the enormous gap that exists within ASEAN, between members wanting to negotiate collectively (using the ASEAN or the ASEAN+3 framework) and other members aiming at quicker progress and thus switching to bilateral trade agreements. The more developed members, such as Thailand and Singapore, already are relatively open economies and they expected that ASEAN (AFTA) could enhance their global competitive position through further specialization and increased FDI inflows. Other less developed countries prefer enhancing intra-ASEAN trade and closing the development gap within ASEAN. These less developed member countries still block the introduction of a "national treatment" rule for foreign investment. There is also policy dialogue on economic cooperation between ASEAN, Japan, Korea and China.

The actual policy debate on common currency arrangements has also changed substantially. In 1990s, many experts noted the reluctance of Japan to take a positive stance towards the formation of a yen bloc in east Asia, partly because of a desire to limit the internationalization of the yen and partly because of concerns that such a policy may be perceived as a second attempt at an Asian co-prosperity area (Frankel 1991; Goto and Hamada 1994). While Japan

is concious of regional opposition to its economic dominant position in the region – it is more relaxed in promoting wide-ranging and public discussion of new financial and currency arrangements in the region (Sakakibara 1999; Kuroda 2000). In this, it seems to have some support from within the region, as shown by the public comments in support of an Asian currency unit by the Philippines President Gloria Arrojo, premier B.G Lee of Singapore and Australian PM Howard.

A. MAJOR CURRENCY PEG

Consideration of common currency arrangements has been stimulated by the successful introduction of monetary union in Europe, and a concern that the fluctuation of the exchange rates in the 1990s played some part in causing Asia's currency crisis in 1997. There is also a sense that Japan's prestige as an economic power is on the line unless it becomes the centre of a regional currency arrangement, in the same way as the United States is to the western hemisphere (dominant economy), and Germany is to Europe (European locomotive of growth). The proposals for common currency arrangements are mainly of two types. The first is the formation of a currency area, with countries in the region pegging their currencies to a basket of the yen, dollar and euro (Council on Foreign Exchange and Other Transactions 1999; Kuroda 2000). The weights could be based on their own trade shares with Japan, the United States and the European Union. Alternatively, they could be based on a regional average of trade shares with Japan, the United States and the European Union (Dornbusch and Park 1999; Williamson 1999; Murase 2000). It does not necessarily follow that in a common-basket peg arrangement each country has to adopt a fixed exchange rate or surrender its own monetary sovereignty, although in practice formation of a currency area does limit national policy discretion, and probably to a substantial degree (Kenen 1997; Mussa, 1997).

Those economists who support a common-basket peg argue, that the exchange rate could be fixed to the peg or it could move within a specified band around the peg, say 7–10 per cent (Williamson 1999) or 15 per cent (Murase, 2000). This system would also be accompanied by a regional fund to support currencies remaining within the band (Kuroda 2000; Murase, 2000), perhaps similar to the reserve credits provided by the Reserve Tranche in European Monetary Cooperation Fund to support the exchange rate pegs of the European Monetary System, established in 1979. Dornbusch and Park (1999) view a common-basket peg arrangement as the end of the process. Murase (2000), however, sees it only as a first

step. He argues that the common-basket peg should be converted at some stage to a regional peg, called an Asian currency unit (ACU). This would entail countries in the region pegging their currencies to a weighted average of regional convertible currencies, possibly with some weight given to the dollar and euro but with primary weight given to the yen (see also Sakakibara, 1999). The yen would be the de facto anchor currency of the region.

A common-basket peg is an important first step because it is seen as a way to increase the correlation of regional currencies with the yen (Council on Foreign Exchange and Other Transactions 1999; Murase 2000). From a non-Japanese perspective, Moon, Rhee and Yoon (2000) argue for a regional currency unit in preference to a basket peg because they see the former as more likely to engage a wider set of countries in regional currency and liquidity Support arrangements, and hence more likely to alleviate fears of domination by Japan. Moon, Rhee and Yoon (2000) envisage a target zone for an ACU maturing into a regional fixed exchange rate system. For Murase (2000), the final stage is currency union, which is the second type of common currency arrangement. This is admittedly a long-term objective. Interestingly, the proposal for currency union is not that countries in the region formally adopt the yen, but that a new currency be formed. This would imitate European monetary union. From Japan's perspective, as Germany was prepared to give up the mark for the euro, so too will Japan give up the yen for a regional currency. This is also more acceptable to non-Japan east Asia (Moon, Rhee and Yoon, 2000).

The available studies of the region varies geographically somewhat in the literature. In this paper, the region under consideration includes 15 economies, including Australia, Cambodia, China, Hong Kong, Indonesia, Japan, Korea, Laos, Malaysia, New Zealand, the Philippines, Singapore, Thailand, Taiwan and Vietnam. It includes three of the new ASEAN members and, as in the studies of Eichengreen and Bayoumi (1999) and Murase (2000), Australia and New Zealand.

B COMMON-BASKET PEG

As an alternative to floating or pegging the exchange rate to one major currency, some analysts have recommended that Asia-Pacific economies peg their currencies to a basket of the dollar, euro and yen. Williamson (1999), Dornbusch and Park (1999) and Murase (2000) support the view, that east Asia — or at least some part of it — should collectively peg their currencies to a basket with common trade weights.

This argument is based on two facts. The first is that over 40 percent of East Asia's trade is with itself (and 29 percent including Australia and New Zealand), substantially up from about 20 percent two decades ago (and percent subsequently). This fact is used to support the argument that intra-regional exchange rate stability is important for regional economic stability. The second fact is that non-Japan East Asia has substantial trade not just with Japan (about 14 percent of trade, including Australia and New Zealand 22 percent)), but also the United States (about 14 percent (21 subsequently)) and the European Union (about 12 percent (19 percent)). This is used to support the argument that Asian currencies need to be stabilized against a basket of the three major currencies, and not just one of them.

With an emphasis on reducing intra-regional exchange rate volatility proponents of a basket peg argue that the weights in the basket peg should be the common regional trade shares with Japan, the United States and the European Union. Using a set of common weights eliminates intra-regional exchange rate volatility, whereas using unilateral weights does not. A basket peg needs to be robust to be viable. In the current environment of open integrated and sophisticated financial markets and large and variable capital flows, it is necessary that exchange rate regimes be sustainable and strong enough to absorb shocks and speculation. Moreover, it follows that if a regional system of basket pegged exchange rates is or becomes inconsistent with a member country's domestic economic structure or policy regime, it will be tested by domestic and external speculators.

Mainly due to the historical considerations, a common-basket peg would not be viable without a strong political commitment on the part of Asia-pacific countries. To the extent that outcomes under a common-basket peg conflict with national economic and policy interests, the system is vulnerable to speculative attack. From that point of view Asia-Pacific would not appear to be ready or an obvious candidate for a formal common-basket peg arrangement. Alternative exchange rate regimes need to be compared to the system that is currently in place. During the Asian currency crisis, most countries in the region abandoned implicit pegging to the dollar and moved to managed floating (the only exception being Hong-Kong dollar). As economies have recovered, the authorities in some countries have attempted to contain the appreciation of their currencies relative to the US dollar. To the extent that this marks a return to implicit dollar pegging, these countries may be recreating the very conditions which led to the financial crisis in 1997. While formal pegging to a common basket may not seem like a good idea for countries in Asia-Pacific, nor is implicit dollar pegging. Williamson's critique of implicit dollar pegging by Asian countries seems to be correct, even

though his remedy needs to be subject to a good deal more careful scrutiny.

C CHOICE OF THE BEST CURRENCY REGIME FOR TWO COUNTRIES

Should these three options be considered unfeasible under current conditions – the other option may be the establishment of bilateral currency arrangements *ie* to determine the best currency regime for each or both of the two small/medium sized economies in this region. The three policy options we may consider are:

(a) Two small/medium sized countries (For example Malaysia and Thailand) have a fixed exchange rate between their currencies that floats against the Japanese yen (or US dollar). With an immutable fixed exchange rate the two currencies act as a single currency. This kind of monetary union is described in Grimes et al. (2000)

(b) Two countries have a flexible exchange rate between their currencies with each floating against the yen or United States dollar. This is generally the status quo under present arrangements in most countries of Asia-Pacific.

(c) Two countries each have a fixed exchange rate against the third country (for example, Japanese yen) and therefore a fixed exchange rate between their two currencies. The three currencies operate as a single currency. This is a modified proposal of the *yennization* advanced as a possible option by Grimes et al. (2000).

This last proposal is substantially equivalent to *yennization* (two countries, say Malaysia and Thailand using yen as their currency). Our discussion of this option ignores *seigniorage* effects that would be important with strict *yennization*. These options are denoted below as options (a), (b) and (c). In considering the selection of the optimum option we assume that the objective behind choosing a currency arrangement is the promotion of the macroeconomic stability of real output in the concerned countries. Given the existing closer economic relations agreements between Malaysia and Thailand, Singapore and Brunei, Hong-Kong and China, Australia and New Zealand it may be that these countries are interested in maximizing the joint stability of aggregate output across both economies rather than the independent stability of output in each of the two economies (this is referred in literature as an independent stability objective).

The *sine qua non* condition for countries to use the same currency is that their economies have similar structure and adjustment processes. An independent exchange rate provides a country with a means to adjust relative prices as its economic circumstances change. If eco-

nomic structures and systems between countries are similar, and if other adjustment processes within this set of countries are flexible and efficient, then the need for each country to have its own exchange rate are less strong (Mundell, 1961). The similarity in structure includes foreign trade, industry and financial system, as well as common policy structures (Haberler, 1966), including the need for some form of fiscal transfer to redistribute or compensate for differences in unemployment between countries in a common currency bloc (McKinnon, 1963; Kenen, 1969).

The experiences of European Union with euro seem to suggest that common currency arrangements themselves tend to make countries' structures and policies more similar (Scitovsky, 1958; Frankel and Rose 1998). If non-monetary adjustment processes in an economy work quickly and efficiently, the need for an independent currency is also less obvious. One aspect that features prominently in the analysis is factor mobility. The more mobile labor is within a region, and the less mobile it is between regions, the more appropriate it is to fix the exchange rate and adopt a common currency within the region (Mundell, 1961). Another factor is price flexibility. The more flexible and responsive are domestic cost and price structures to adverse shocks, the less costly is adjustment in the real side of the economy, and the less obvious is the need for the country to have an independent currency (McKinnon, 1963). This view is strongly emphasized by the recommendations of the G-Cubed Asia-Pacific currency model

THE ASIA PACIFIC MODEL

The (Asia Pacific) multi-country model is based on the G-Cubed model developed in McKibbin and Wilcoxen (1998). It combines the intertemporal macroeconomic approach taken in the MSG2 model of McKibbin and Sachs (1991) with the disaggregated, econometrically-estimated, intertemporal general equilibrium model of the U.S. economy by Jorgenson and Wilcoxen (1989). The model was constructed to contribute to the current policy debate on global warming, trade policy and international capital flows, but it has many features that make it useful for answering a range of issues in monetary integration and macroeconomic questions. It is a world model with substantial regional disaggregation and sectoral detail. In addition, countries and regions are linked both temporally and intertemporally through trade and financial markets.

The model contains a strong foundation for analysis of both short run macroeconomic

policy analysis as well as long run growth consideration of alternative macroeconomic policies. Intertemporal budget constraints on households, governments and nations (the latter through accumulations of foreign debt) are imposed. To accommodate these constraints, forward looking behavior is incorporated in consumption and investment decisions. Unlike the MSG2model, the model also contains substantial sectoral detail. This permits analysis of environmental and trade policies which tend to have their largest effects on small segments of the economy. By integrating sectoral detail with the macroeconomic features of the MSG2 model, it can be used to consider the long run costs of alternative environmental regulations and trade policy changes yet at the same time consider the macroeconomic implications of these policies over time. The response of monetary and fiscal authorities in different countries can have important effects in the short to medium run which, given the long lags in physical capital and other asset accumulation, can be a substantial period of time. Overall, the model is designed to provide a bridge between computable general equilibrium models and macroeconomic models by integrating the more desirable features of both approaches.

The key features of the (Asia Pacific) model are summarized in table 1. The model consists of eighteen economic regions with six sectors in each region (there are also two additional sectors ineach region that produce the capital good for firms and the household capital

Table 1 Summary of Key Features of the Asia Pacific Model

(1)	Specification of the demand and supply sides of economies;
(2)	Integration of real and financial markets of these economies with explicit arbitrage linkage realand financial rates of return;
(3)	Intertemporal accounting of stocks and flows of real resources and financial assets;
(4)	Imposition of intertemporal budget constraints so that agents and countries cannot forever borrow or lend without undertaking the required resource transfers necessary to service outstanding liabilities;
(5)	Short run behavior is a weighted average of neoclassical optimizing behavior based on expected future income streams and Keynesian current income;
(6)	The real side of the model is disaggregated to allow for production of multiple goods and services within economies; International trade in goods, services and financial assets;
(7)	Full short run and long run macroeconomic closure with macro dynamics at an annual frequency around a long run Solow/Swan/Ramsey neoclassical growth model.
(8)	The model is solved for a full rational expectations equilibrium at an annual frequency from1996 to 2070.

good). For all regions, the internal macroeconomic structure as well as the external trade and financial linkages are completely specified in the model. Each economy or region in the model consists of several economic agents: households, the government, the financial sector and the production sectors. Each of these economic actors interact in a variety of markets, both domestic and foreign.

In summary, the model suggests that the robustness of a regional exchange rate system depends on how common are individual country's economic structures, policies, and internal and external shocks. Evidence from analysis of common factors affecting real effective exchange rates in the region, and co-integration analysis suggest that economic structures, policies and shocks are heterogeneous. Of course, the adoption of common currency arrangements may alter this. The robustness of such a regime also depends on a range of political factors about which there are important questions — a common-basket peg appears to conflict with other domestic policy objectives, it is difficult to show that countries are prepared to make substantive policy decisions collectively rather than individually, and a common-peg basket may not suit some countries' strategic interests in the region.

The recommendations of the model with regard to Asia Pacific monetary union are mixed. There are deep differences in economic structures, size and diversification of the concerned economies. For example, the Japanese economy is much more diverse than other Asia-Pacific economies, there are no formal fiscal transfer arrangements between these nations and Japan — and no likelihood of them — and none of these countries has free labor mobility with any of the other country of this region. Moreover, real exchange rates of these countries diverge substantially from each other at times

MONETARY ARRANGEMENTS IN ASIA-PACIFIC AND ECONOMIC STABILITY

The reason for focusing on output stability measures here is that they are linked to ultimate economic objectives such as consumption. The idea that each country might place some weight on the stability of the other country reflects the idea that the countries have been pursuing closer economic ties. Here economic shocks are supposed to originate in asset markets (monetary shocks), or in goods markets (real shocks). These shocks reflect random changes in asset or output demands or in supplies of goods or assets. The two types of shocks occur in each of the three concerned economies so, from the viewpoint of a particular country, and two

possible types of random shocks can be identified each with three possible origins: real shocks: (these occur either in one country (called an internal disturbance), or in its partner country (a close-neighbor disturbance) or in the third country (Japan, USA) - an external disturbance) and; monetary shocks: (these occur in one country (internal), in partner country (close-neighbor) or in the third country (Japan, USA) and are of external nature).

In considering the impact of various monetary arrangements on stability we can then draw on the standard Mundell (1968) assumtions on the insulation properties of alternative exchange rate systems to determine how the respective currency arrangements will moderate effects of various shocks. These are analyzed formally in a complete two country model by Clarke (1979).

Monetary shocks in a small open economy fall mainly on the 'rest of the world' under fixed exchange rates. The shocks have no significant effects on international interest rates so their impact on the country releasing them is negligible.

All other factors being constant, a monetary expansion encourages an exchange devaluation which may result in raising local output. Flexible exchange rates are relatively less stabilizing for local real output. Relations for small economies receiving the effects of external monetary shocks originating in large economies countries are the reverse of those just described. Small open economies (Thailand, Malaysia) are relatively worse off in output stability terms when external money shocks occur in a large country (for example Japan) provided that exchange rates with the large country are fixed rather than flexible. Under fixed exchange rates the effects of a monetary expansion in a large economy are strongly felt locally because the induced interest rate fall is fully transmitted to the small economy. Under flexible exchange rates however this expansionary impulse is offset by a depreciation of the large economy's currency and when small/medium (for example Malaysia and Thailand) country's income is small compared to Japan's income the net effect of the disturbance on this country is close to zero (Mundell, 1968). Flexible exchange rates are therefore relatively most stabilizing for a small open economy facing external monetary shocks. Monetary close-neighbor shocks in partner country will be most destabilizing for a given country when both countries have a fixed exchange rate that floats against the rest-of-the-world's currencies. A monetary expansion in partner country will simultaneously depreciate both the both countries' currencies against other currencies. Small/medium sized country is most protected against such shocks in partner country when it has flexible exchange rates with each other currency.

Real demand shocks in a small open economy fall on the 'rest of world' under floating

exchange rates system. An expansionary local demand shock appreciates the currency and slowing down the expansion. Under fixed exchange rates however the real shock does not generate this counter-balancing exchange rate adjustment. Hence flexible exchange rates are relatively stabilizing for dealing with real shocks for the country releasing them. Fixed exchange rates, by not enabling an offsetting exchange rate adjustment, enhance real disturbances and hence are relatively destabilizing for the country.

Relations for small open economies receiving external real output demand shocks are the reverse of these. Under fixed exchange rates a Japan demand expansion will stimulate Japanese purchases of exports from a given country with such effects on this country's economy being offset by higher international interest rates. The net effect of this change depends on which of these effects is stronger. Under managed floating exchange rates effects of a hypothetical real Japanese expansion are also offset by an induced depreciation of the Japanese yen. On the other hand no such induced offsetting effect occurring under fixed rates. As Mundell (1969) suggested when the small country's income is small relative to the income of the country emitting the real shock – the effects of the disturbance go to zero. Therefore flexible exchange rates work best at stabilizing external real shocks for a small open economy. Real close-neighbor expansionary shocks in partner country will be most destabilizing for small/medium economy when this shock appreciates the value of partner's currency – this can only occur when the exchange rate between the currencies is kept flexible. The effects here differ from those accompanying hypothetical Japan's real shocks because the induced monetary effects on interest rates will be negligible when partner economy is subject to a real shock.

Due to Asia's diverse economic conditions and developments, a viable approach for regional monetary integration might be to start with smaller currency areas, (*clusters*), and the enlargement of these *clusters* at a later stage. On the basis of symmetry in macroeconomic disturbances, geographic proximity and socio-cultural compatibility, our results suggest five sets of country groupings as plausible candidates for potential monetary cooperation or integration, namely: Thailand and Malaysia, Singapore and Malaysia with Brunei, Japan and Korea, Australia and New Zealand and China, Taiwan and Hong Kong. These five groupings also represent the Southeast region, the (sub) Northeast region, the Pacific region and the Greater China (of the Northeast) region respectively.

The groupings of Singapore and Malaysia, and Japan and Korea respectively, is not surprising, as Singapore and Malaysia trade heavily with one another, and Japan and Korea are

among each other's main trading partners. On the other hand, Hong Kong trades heavily with China, and has exhibited a positive growth correlation with the mainland, nevertheless, both these Chinese (very different) economies have displayed asymmetric bilateral shocks. In fact, China has also experienced mainly idiosyncratic shocks or insignificant correlations with the rest of the Asian economies. As such, on the basis of the significant symmetry of permanent disturbances, the combination of Taiwan and Hong Kong, of the Greater China region, may be a more plausible option. In general, Taiwan has also displayed a strong interrelation with the other newly industrialized economies (NIEs) and Japan in permanent supply disturbances, and in particular with Hong Kong

The reverse set of rankings here with respect to internal real and monetary shocks occur if policy autonomy rather than insulation is sought. Fixed exchange rates stabilize internally generated monetary shocks but mean monetary policy cannot be effectively used to stabilize internal output levels. This particularly leaves a small open economy vulnerable to external monetary shocks. Flexible exchange rates mean fiscal policy can only be less effectively used to stabilize the economy against internal real shocks and leaves a small open economy vulnerable to external real shocks. If efficiency of discretionary fiscal and monetary policy is combined with the currency regime choice – the latter one will depend on which policy instrument is regarded as most efficient. The hypothesized effects of shocks on two small economy such as Malaysia or Thailand can be summarized as follows:

Table 2 Stability under different monetary arrangements

Source	**Internal**	**Close neighbour (baht, yen, A$, S$, T$, HK$ ringitt, renminbi, rupiah)**	**External (Euro, U$)**
Real	Largest with c Smallest with c	Smallest with b Largest with b	Largest with b Smallest with c
Monetary	Largest with b Smallest with b	Smallest with c Largest with c	Largest with a Smallest with a or c

RELATIVE STABILITY UNDER ALTERNATIVE MONETARY ARRANGEMENTS

Below is a short summary of the alternative monetary arrangements and their impact on

domestic and external stability which follows the methodology proposed by Clarke (2000) for monetary union between Australia and New Zealand.

Real internal shocks. With all other factors being constant, option (a) may destabilize small/medium economy given real internal shocks compared to (b). Option (a) will tend encourage to export shocks to the neighbor economy (Japan) but not to partner economy. Option (b) tends to export them both to foreign countries. Option (c) would prevent internal shocks from spreading outside and is least stabilizing of the three. For real internal shocks the options are ranked in terms of independent stability as (b) > (a) > (c).

The reverse of this ranking will be sought if this economy seeks autonomous fiscal policy rather than insulation from the effects of its own real internal shocks. Joint stability is best pursued using (a) since this transfers the shock to the third country or neighbor country (United States, Japan) but not to partner economy. On the other hand option (c) would prevent the shock from expanding outside rather than allowing it to fall over the larger combined Malaysian and Thai economy and hence is least stabilizing. Thus the options ranked in terms of joint stability are: (a)> (b) > (c).

Real Close-Neighbor Shocks. Option (a) would most probably insulate Malaysia from shocks in Thailand by transferring much of the shock to the neighbour or third (Japanese, US) economy. Option (b) will allow a shock in Thailand to be shared between all three economies. It will be only very marginally less stabilizing than (a) given that Malaysia is small compared to the Japanese economy. Option (c) will insulate the shock from spreading in the economy that releases it and is most stabilizing for Malaysia. Hence if independent stability is sought then the ranking is: (c) > (a) > (b). If joint stability across the two economies is sought then the ranking will be: (a) > (b) > (c). Since option (a) allows to transfer shock entirely to a third country (Japan), option (b) would encourage the transfer across the two economies and option (c) leaves it in Thailand entirely where it is highly destabilizing.

Real External Shocks. Option (a) will transfer real shocks from third country to Malaysia and Thailand but will prevent secondary shocks in either Malaysia or third country from impacting on the other economy. Option (c) will insulate Malaysia and Thailand from such shocks. Finally, option (b) will transfer shocks from third country into these smaller economies where secondary shocks in these small economies will impact on each of the other economies. Hence if independent stability occurs the ranking is: (c)> (a) > (b). Here (c) gives complete insulation from the external real shocks while option (a) is preferred over option (b) since (a) prevents induced real shocks in each of the small economies from

impacting much on the other economy. In case of option (c) the shock is restricted to the third country while in cases of option (a) and (b) it is transferred to the smaller economies. Option (a) is relatively most stabilizing since secondary real shocks in either small economy are not exported to the other economy.

Monetary Internal Shocks. Option (c) will allow monetary shocks in Malaysia to fall on Thailand and the third country. It is therefore most stabilizing for Malaysia. Option (a) allows shocks in Malaysia to fall on the other economy but not on close neighbour (Japan). It is second most stabilizing. Consequently, option (b) is least stabilizing. Thus the ranking in terms of independent stability is (c) > (a) > (b)

These rankings are reversed if national autonomy in monetary policy is sought rather than insulation from internally-generated output shocks. In terms of joint stability option (b) will bottle up a shock in the economy releasing it and this will be relatively destabilizing. Option (a) will share the shock between the two small countries but not with the neighbor country (Japan), and will therefore be more stabilizing than (b). Option (c) will export the shock to both Thailand Japan and will be most stabilizing. Thus for joint stability the ranking is: (c) > (a) > (b)

Monetary Close-Neighbor Shocks. An internal shock in Thailand will be kept entirely there under option (b) so this most stabilizing for Malaysia. Under option (c) a small amount of the disturbance will leak to Malaysia but most will go to Japan. Under option (a) the effects of the shock is shared between the small economies with none leaking to the neighbor economy (Japan). Thus in terms of independent stability the ranking is: (b) > (c) > (a). In terms of joint stability the ranking is: (c) > (a) > (b) since under option (c) most of the disturbance is transferred to Japan while under option (a) its effects are shared across the two economies and under (b) it is restricted to Thailand where it is relatively destabilizing.

Monetary External Shocks. Option (b) limits shocks to the neighboring economy (Japan). It is stabilizing for Malaysia. Option (a) does almost the same, and option (c) transfers the monetary shock to the small economies and is least stabilizing. Hence the independent stability ranking is (a) or b > (c).

CONCLUSIONS

With respect to the independent stability of either of the small open economies: option (a) of monetary union does not get strong support. It is only as good as option (b) in stabilizing

external monetary shocks and does not give good autonomy in monetary or fiscal policy either. Option (b), the status quo, is best for real internal shocks or external/close-neighbor monetary shocks. It enables autonomous monetary policy. Option (c), *yennization*, is best for real external/close-neighbor shocks and internal monetary shocks. It enables autonomous fiscal policy. With respect to the joint stability of both small economies; option (a) of monetary union gets support with respect to real internal or close neighbor shocks and ties with (b) for external monetary shocks; option (b), the status quo, works well for close neighbor monetary shocks and ties with (a) for external monetary shocks; option (c), *yennization*, works well with real external shocks and monetary internal/close-neighbor shocks.

The choice of option (c) may be rationalized in many ways. Japanese yen is the second most traded currency in the world (BIS 2003), and so offers substantial liquidity. While the Chinese yuan and the US dollar are also candidates, the Japanese yen is the most viable anchor for monetary union by the Asia-pacific nations. Not only is Japan the region's key trade partner, but the stabilizing properties of the yen are substantially greater for commodity price shocks than those of the yuan and the US dollar (Grimes, Holmes and Bowden 2000), and liquidity is substantially deeper in the yen market than the yuan dollar market (de Brouwer 2001).

Japanese economy is also a good anchor country because it has a strong record of low and stable inflation. While China's inflation record is also good, Japan's inflation target has been applied more flexibly, with substantially higher and more stable output growth than China (Grimes, Holmes and Bowden 2000; de Brouwer 2000). On the other hand there are certain potential disadvantages of the *yennization* option. The first is that countries lose autonomy in their monetary policy, although in some cases this would be an advantage (Duncan and Xu 2000). Adopting another country's currency is also viewed as a loss of national prestige and sovereignty. There is a well-documented tendency for people to equate sovereignty with having a national currency (Mundell 1961), but the international debate on this issue is changing, as evidenced not only by the euro experiences, but also by the preference of several Latin American countries to use the US dollar and the emerging debate in Asian countries about establishing a common currency with Japan or using the Japanese yen (Grimes, Holmes and Bowden 2000).

One consequence of adopting another country's currency is the loss of seignorage revenue — the profits from printing currency — which accrue to the authorities of the issuing country; in the case of Japan, this is the Bank of Japan (*Nihon Ginko*). As argued by Duncan and Xu

(2000) and Grimes, Holmes and Bowden (2000), this can be overcome by income transfers from Japan equal to the estimated income losses. Another consequence of adopting another country's currency is that the authorities are limited in their capacity to bail out their banks in the event of a banking crisis. When the authorities do not have the ability to "print money", the capacity to bail out banks is limited by the currency reserve holdings of the authorities. This is not an insurmountable problem since Asia-Pacific governments can borrow funds in international financial markets or could form an agreement with the Japanese government for funds to be lent at commercial rates in a crisis. Given that many banks in Asia-Pacific are foreign owned, this may not be a critical problem.

One alternative to adopting the currency of another country is to establish a currency board, whereby the local currency continues in circulation but its value is fixed against the reference currency and its volume is fixed to the quantity of reserve holdings of the reference currency. A credible currency board is self-stabilizing. If people convert the home currency to the reserve currency, the quantity of the home currency falls which pushes up domestic interest rates. This makes local assets more attractive and so people convert the reserve currency back to the home currency.

A currency board has the advantage as it can eliminate some of the shocks to the exchange rate without seeming to compromise national sovereignty since the domestic currency remains in circulation. But it has a number of disadvantages. As is clear from the experiences of Argentina and Hong Kong in recent years, currency boards invariably come under pressure, and these stresses appear in the form of higher interest rates. Moreover, currency boards are not a credible alternative for most countries since the commitment to fix the exchange rate and back the domestic currency with reserves of the reference currency can be revoked at any time. This is more likely to occur under crisis conditions, which is precisely the time when credibility and stability matter.

The Asia-Pacific nations are mostly open market, small/medium undiversified economies vulnerable to a range of shocks such as weather and crop failures, changes in foreign demand, and domestic political uncertainty or turmoil and they trade with a varied and often concentrated set of countries. While they have adopted a range of exchange rate regimes, it is an arguable proposition that countries with these characteristics should use the currency of another, bigger country, such as Japan, rather than their own. Adopting the yen would provide a number of advantages in dealing with the vulnerabilities to which these nations' economies are exposed. Not only would it reduce the administrative burden in these

countries, but it would reduce the impact of social disturbances on their economies, eliminate the difficult task of managing liquidity in their foreign exchange markets, and stabilize the exchange rate with their most important trading partner.

The Japanese yen is the most sensible candidate to replace national currencies, given the trade and economic linkages between these countries and Japan, the market size and stabilizing properties of the Japanese yen, and the relatively solid performance of Japanese monetary policy over the past decade. There is not a transitive preference ordering across the types of disturbances even ignoring possible preferences for policy autonomy. If policy concerns are independent then monetary union between the small economies does not make sense. It denies monetary policy autonomy in each economy and may not stabilize either internal or external or close neighbor real/monetary shocks better than either the current system of managed floating.

These comments suggest a multi-speed strategy towards Asian monetary integration. Owing to the diverse economic circumstances of this region, a practical approach towards regional monetary integration would be to begin with smaller currency areas. We have identified five plausible groupings of East Asian countries for potential monetary union, mainly on the basis of their symmetry of underlying shocks, geographic proximity and possibly socio-cultural compatibility.

The implication of this result is that the sub-regional groupings could first focus on internal harmonization with each other, and then on external harmonization with the other sub-regional groupings as the intermediate and longer-term strategy. In the very long run, countries participating in the various sub-regional currency areas may even consider integrating among themselves in forming a single currency area, once the sufficient degrees of harmonization and convergence have been achieved. In the meantime, Asian economies should concentrate on fostering greater economic integration through trade and investment flows, so that the option of a single currency becomes attractive. Nevertheless, the drive towards regional integration will depend on both economic and non-economic factors as well.

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