ISAS Working Paper

No. 69 – Date: 18 June 2009

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Monetary and Financial Cooperation in Asia: Making Sense Out of the CMI, CMIM, ABF, ABMI and ACU Alphabet Soup[1]

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1. Introduction

Ever since the currency crisis of 1997-98, there has been a great deal of interest in enhancing regional economic cooperation in Asia. It is important to keep in mind that economic regionalism is multidimensional nature. As noted by Kuroda (2005), economic regionalism can be broadly divided into four categories, viz. trade and investment; monetary and financial; infrastructure development and related software; and cross-border public goods (cooperation with regard to contagious diseases such as avian flu, SARS and swine flu, as well cross-border pollution such as the haze fires in Indonesia which affected many of its Southeast Asian neighbours). This paper concentrates on the issue of *de jure* monetary and financial regionalism in Asia. In other words, the focus here is on policy initiatives underway in Asia to enhance monetary and financial regionalism and the analytical bases for these initiatives, rather than on examining the actual level of financial and monetary links that already exists (which may or may not have been facilitated via regional policy mechanisms). A companion paper examines the *de facto* financial linkages within selected Asian economies (see Keil, Rajan and Willett, 2009).

There are many gradations of monetary and financial regional, ranging from the weak form involving regional policy dialogue and surveillance on the one hand, to exchange rate and monetary coordination on the other. To maintain focus, this paper concentrates more narrowly on some "medium forms" of monetary and financial regionalism, broadly defined as the development of regional liquidity arrangements and regional financial markets. The specific rationale for such "medium forms" of monetary and financial regionalism arises directly from the "capital account nature" of crises. As will be discussed, beyond "sound" macro policies, these new-style crises have in turn made apparent the need to (a) ensure availability of sufficient liquidity in the event of a bust; (b) diversify sources of funding/channels of intermediation to minimise intensity of busts; and (c) minimise balance sheet mismatches (both maturity as well as currency mismatches) (Rajan, 2003).

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[1] This paper builds upon and updates Rajan (2008), Pontines and Rajan (2008) and Chapters 10 and 11 in Rajan (2009).

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The remainder of this paper is organised as follows. Section 2 takes stock of recent developments in monetary regionalism in Asia, paying specific attention to the Chiang Mai Initiative (CMI) and the newest initiative – the CMI multilaterilisation (CMIM), unveiled by the ASEAN plus Three (APT) Finance Ministers in Bali, Indonesia in May 2009.[3] Section 3 discusses recent developments in the area of financial regionalism in Asia, focussing specifically on bond market integration in the form of the Asian Bond Fund (ABF). Section 4 discusses the next steps that might be taken to enhance monetary and financial regionalism in Asia. Section 5 analyses issues surrounding the Asian Currency Unit (ACU). Section 6 concludes the paper.

2. Monetary Regionalism in Asia: Chiang Mai Initiative

The Chiang Mai Initiative (CMI) is a network of swap arrangements which was agreed among the APT countries in May 2000. It is important to keep in mind that the CMI is not envisaged to be either a mechanism for inappropriate currency pegging in the region or a mechanism for managing a crisis after it erupts. Rather, it is primarily aimed at preventing a crisis from erupting in the first instance. However, what is the analytical basis for pursuing such a regional liquidity arrangement? Stylised preventive steps in the event of crisis of confidence include (a) some combination of raising interest rates to reduce capital outflows and a "calibrated" currency depreciation;[4] (b) talking up the market to try and instil confidence; and (c) ensuring availability of sufficient liquidity. The latter involves ensuring the availability of sufficient own resources (that is, foreign exchange reserves) as well as organising external liquidity arrangements that are automatically accessible when needed.

2.1 Importance of Liquidity

It has long been recognised that inadequate liquidity can threaten the stability of international financial regimes (Bird and Rajan, 2002). Illiquidity can create crises even when economic fundamentals are sound, or it can make a bad situation worse when the fundamentals are weak. Moreover, once it becomes a problem, illiquidity further undermines the confidence of international capital markets. Capital outflows increase, thereby reducing liquidity still further. The speed and intensity of economic adjustment following a crisis is largely dictated by the scarcity of liquidity; it is the extreme shortage of liquidity that called for rapid adjustment in East Asia in 1998. For instance, Eichengreen and Rose (2001) stress that the East Asian process of a "V-shaped" adjustment between 1997 and 2000 was not very different from the stylised patterns of previous currency crisis episodes in developing countries. However the degree of initial contraction and subsequent recovery was far greater in East Asia, attributable to the severe liquidity crisis that was triggered by investors' panic (Rajan and Siregar, 2001).

Having appreciated the importance of ensuring adequate liquidity as a safeguard against future financial crises, many Asian countries consciously attempted to build up reserves immediately after the 1997-98 crisis partly as a precautionary motive (Aizenman and Marion, 2003; also see Rajan and Siregar, 2004 and Rajan, 2009, Chapter 9). Nonetheless, it is recognised that reserve accumulation (so-called "floating with a life-jacket") is costly on many fronts (as the country effectively swaps high yielding domestic assets for lower

[3] See http://www.mofa.go.jp/region/asia-paci/asean/conference/asean3/joint0906.pdf.

[4] There are a whole host of issues that go into determining the optimal combination of expenditure changing and expenditure switching policies (see Rajan, 2009, Chapter 7).

yielding foreign ones).[5] In view of this, countries have recognised that they need to buttress their own reserve holdings with external liquidity arrangements, a view that has been reinforced by the ongoing global financial crisis. Against this background, and in recognition that financial stability has the characteristics of a regional public good,[6] it is understandable that Asian countries have been eager to promote regional monetary cooperation. The CMI has taken centre-stage in this regard.

2.2 Evaluating the Chiang Mai Initiative

The CMI, as initially conceived, has two components, viz. (a) ASEAN swap arrangement (ASA) which was expanded from 5 to 10 countries, and from US$200 million to US$1 billion;[7] and (b) networks of bilateral swap arrangements (BSAs) among the three North Asian countries (Japan, China, Korea), and one of these three and one of the ASEAN countries (Figure 1).[8] The expanded ASA is to be available for two years and is renewable upon mutual agreement of the members. Each member is allowed to draw a maximum of twice its commitment from the facility for a period of up to six months with the possibility of a further extension of six more months at most. The basic characteristics of the BSAs are as follows: 20 percent of the liquidity can be drawn automatically without conditionality for 630 days (90 days, renewable seven times). Interest paid is LIBOR+1.5 percent for first 180 days, rising by 50 basis points for each renewal to a maximum of LIBOR+3 percent. Importantly, the swap providing countries form their own individual opinions on the potential swap recipient. Drawing of more than 20 percent regional liquidity requires the country to come under International Monetary Fund (IMF) conditionality.

While the CMI has been an important step in Asian monetary regionalism, as it is the first time regional countries have pre-committed resources as a means of regional financial safeguard, it clearly remains a work in progress. Rajan (2008, 2009, Chapter 10) raised a number of details that remain to be worked out if the CMI is to be an effective liquidity enhancing measure. The first is its inadequate size, especially its liquid component. For instance, the current aggregate size of US$90 billion among all 13 APT countries (as of April 2009) – while growing all the time – still pales in comparison to the crisis packages offered to Korea, Indonesia and Thailand in 1997-98. The second is the issue of how coordination between potential creditor countries is to be done. For instance, is the bilateral arrangement subject to regional approval? How is borrowing/lending to be distributed? Both these questions lead on to the key issue of how to regionalise (though more commonly referred to as "multilateralise") the CMI which is a series of bilateral and rather uncoordinated swaps.

2.3 The Chiang Mai initiative Multilateralisation

As far back as the Eighth APT's Finance Ministers' Meeting in Istanbul in May 2005, there was an agreement to re-evaluate the CMI, including the possibility of regionalising the

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5 In addition, there is the question of what the appropriate size of reserve holdings is; against what yardstick should reserve adequacy be measured (Bird and Rajan, 2003 and Kim et al., 2005)? This is an important point highlighted once again by the ongoing global financial crisis where countries in Asia -- Korea most notably -- faced large-scale portfolio capital outflows.

6 More specifically, financial crises emanating from developed countries tend to have global dimensions while those from emerging economies tend to be more regional in scope.

7 There are also a series of repurchase agreements that allow ASEAN members with collateral such as United States Treasury bills to swap them for hard currency (usually US$) and then repurchase them at a later date.

8 See Henning (2005, 2009) and Park (2004) for more details on the CMI and monetary regionalism in Asia more generally.

arrangements.[9] As part of this there was an agreement to look into developing a collective mechanism to activate the swaps. There was also a recognition of the need to improve on the extent of regional dialogue and surveillance and link these more closely and effectively to the CMI. There was not very much forward movement on these issues until recently (Henning, 2009). However, in the latest meeting of APT Finance Ministers in Phuket, Thailand, in April 2009, the APT countries finally reached an agreement to transform the existing bilateral arrangements into a regional foreign reserve pool of US$120 billion to "address short-term liquidity difficulties in the region and to supplement the existing international financial arrangements." [10] The CMIM is expected to be launched by end of 2009.

The "Plus Three" countries of China, Japan and South Korea will contribute 80 percent, while the 10 ASEAN countries share the remaining 20 percent. Of the total amount, Japan is to contribute US$38.4 billion to the pool (it has also extended US$60 billion of yen-denominated swap facilities separately) as will China (in conjunction with Hong Kong), while Korea will contribute US$19.2 billion. Within ASEAN, the contributions of the member economies will be primarily by Indonesia, Malaysia, Thailand, Singapore (each contributing US$4.76 billion) and the Philippines (US$3.68). Other details remain unclear, though it appears that the same conditions as the CMI (that is, 20 percent unrestricted borrowing and 80 percent balance only with IMF conditionality) remain in place. Importantly, the regional economies have agreed to create a stronger regional surveillance system in conjunction with the Asian Development Bank (ADB) and the Secretariat of the Association of Southeast Asian Nations (ASEAN) to provide oversight of the fund and help with its operation.

Presumably if and when this surveillance system is effectively established, the 20 percent of reserves that can be tapped without IMF conditionality will be increased, though one will have to wait and see how this evolves. Given that the region holds well over US$3,000 billion of reserves, the proposed reserve fund is modest as of now but has the potential for significant expansion over time. The membership issue of the CMIM is an important one, with there being suggestions that monetary and financial regionalism in Asia be expanded to include India, Australia and New Zealand, all of whom have joined the APT countries to become the founding members of the East Asian Summit (EAS).[11] As noted by Dayaratna-Banda and Whalley (2007):

> ASEAN has already entered into a framework agreement with India on a comprehensive economic partnership. China has entered into arrangements with India, New Zealand and Australia, and Japan also has regional arrangements with these countries. Some initial negotiations for a free trade area between ASEAN, Australia, and New Zealand have also begun. These three countries have increasingly more open economies, and their links with East Asia are likely to expand over time. These economies have been increasingly integrating with East Asia. Including them in East Asian regional forums and arrangements expands the set of developed and fast growing economies with well-functioning economic and financial systems and markets...The possibility of ASEAN+6 monetary cooperation can thus not be ruled out (p.41).

[9] See http://www.aseansec.org/17448.htm.

[10] See http://www.aseansec.org/22536.htm. Final agreement was reached at the side-lines of the ADB annual meetings in Bali, Indonesia in May 2009.

[11] Also see Kumar (2005) and Rajan (2005).

The inclusion of India would also help with risk diversification as well as enhance the weight of the fund in world affairs (both India and China being among the BRIC [Brazil, Russia, India and China] countries which held their inaugural summit in June 2009). In fact, it is very notable that Japan has separately agreed to a currency swap deal with India, whereby both countries have agreed to swap their respective currencies for up to US$3 billion in US$. Rather than India signing swaps with other APT countries bilaterally (possibly creating an untidy noodle bowl effect as has happened in trade agreements in Asia), it makes far more sense to include the country within the CMIM framework itself.

While the membership issues need to be effectively resolved, the CMIM has provided much-needed impetus to monetary regionalism in Asia and is an important step in creating pools of liquidity of the type initially recommended by Rajan and Siregar (2004). Ideally, Asian countries should work towards developing reserve pools that involve three tiers of liquidity. The first tier would be owned reserves which offer the highest degree of liquidity and have zero conditionality, but are costly. The second tier would be sub-divided into a country's own reserves placed with a regional pool and other members' reserves with the pool (CMIM).[12] The third tier would be conventional IMF lending via its various facilities. With such a structure the degree of liquidity could be inversely related to the degree of conditionality. Such a regional reserve of insurance pool would help supplement the ongoing restructured/new IMF lending facilities to fortify the regional economies against future financial crises. However, effective deepening of regional monetary integration will not happen until there is considerable strengthening of the regional surveillance mechanism with well worked out surveillance and policy conditionality (thus, the announcement of strengthening of surveillance alongside the creating of the CMIM is an important step).

3. Financial Regionalism in Asia: Asia Bond Fund

3.1 Importance of Bond Markets

While the regional economies are taking noteworthy steps to strengthen, upgrade and integrate their financial systems, the contagious nature of the 1997-98 crisis has led many observers and policy makers to the view that there are positive externalities from cooperating to strengthen their individual financial sectors, to develop regional financial markets, and to diversify their financial structures away from bank-based systems to bond markets. What is wrong with Asia's continued heavy dependence on bank lending as a source of private market financing?

Bond financing is considered a relatively more stable source of debt financing as bank loans are primarily illiquid, fixed-price assets in the sense that the interest rate – which is the price of the loan – does not vary much on the basis of changing market circumstances. Thus, almost all the adjustment has to take place via rises and falls in the quantity of bank lending, which in turn leads to sharp booms and busts in bank flows.[13] These sudden reversals in bank flows had calamitous and long-lasting effects on the domestic financial systems in the East Asian economies in 1997-98.

[12] As Henning (2009) notes, the CMIM was initially called "Self-Managed Reserve Pooling Arrangement" or SRPA.

[13] For instance, see Ito and Park, eds. (2004) and Eichengreen and Luengnaruemitchai (2005). See Hamada et al. (2004) for an overview of Asian bond markets.

The World Bank (2004) has also acknowledged the importance of bond markets compared to bank lending, noting:

> [C]ompared to the bank market, bond markets offers some advantages in terms of longer maturities, tradability, and back-weighted repayment structures that help support equity returns (p.157).

In this regard, two main initiatives have been underway in East Asia. One is the Asian Bond Fund (ABF), established by the eleven members of the Executives' Meeting of East Asia-Pacific Central Bank (EMEAP),[14] and the other is the Asian Bond Market Initiative (ABMI) by the APT economies.[15] The latter, which was endorsed at the APT Finance Ministers Meeting in Manila on August 2003, focuses primarily on developing efficient bond markets in Asia to enable the private and public sectors to raise and invest long-term capital. The activities of the ABMI are primarily concentrated on facilitating access to the market through a wider variety of issuers and enhancing market infrastructure to foster bond markets in Asia. The ABMI has been given a boost by the announcement by APT Finance Ministers in May 2009 of the intention to establish a Credit Guarantee and Investment Mechanism with an initial capital of US$500 million to help bolster the issuance of local currency-denominated corporate bond in the region.[16]

3.2 Evaluating the Asian Bond Fund Schemes

The focus of the remainder of this section is specifically on the ABF which was established in on 2 June 2003. The first stage of the ABF essentially involved the regional governments voluntarily contributing about one percent each of their reserves to a fund dedicated to purchasing regional sovereign and semi-sovereign bonds denominated in US dollars. The initial size of the ABF was about US$1 billion and the fund has been passively managed by the investment management unit of the Swiss-based Bank for International Settlements. The mandate is to invest in bonds in eight of the eleven member countries of EMEAP, the developed countries of Australia, New Zealand and Japan solely being lenders to the ABF. In a noteworthy next step, the ABF 2 (second stage of the ABF) was established in December 2004. The quantum of funds involved was doubled in magnitude (US$2 billion), and its mandate is to invest in selected domestic currency sovereign and quasi-sovereign bonds in the eight countries.

More specifically, the ABF 2 comprises two components (US$1 billion each): (a) a Pan-Asian Bond Index Fund (PAIF); and (b) a Fund of Bond Funds (FoBF). The PAIF is a single bond fund, while the FoBF is a two-layered structure with a parent fund investing in eight single market sub-funds. The International Index Company, a joint venture between ABN AMRO, JP Morgan and Morgan Stanley (iBoxx ABF), has created the benchmark indices for all nine funds. The funds will be passively managed to match the benchmark index. The seed money for single bond funds has been divided on pre-determined criteria and local fund

[14] The EMEAP "is a cooperative organization of central banks and monetary authorities (hereinafter simply referred to as central banks) in the East Asia and Pacific region. Its primary objective is to strengthen the cooperative relationship among its members. It comprises the central banks of eleven economies: Reserve Bank of Australia, People's Bank of China, Hong Kong Monetary Authority, Bank Indonesia, Bank of Japan, Bank of Korea, Bank Negara Malaysia, Reserve Bank of New Zealand, Bangko Sentral ng Pilipinas, Monetary Authority of Singapore, and Bank of Thailand". See http://www.emeap.org/.

[15] More information on all these and other initiatives is available on the portal created and maintained by the Asian Development Bank (ADB) http://asianbondsonline.adb.org/.

[16] http://www.aseansec.org/22536.htm.

managers have been appointed to manage the respective funds (see Ma and Remolona, 2005, p.86).

The specific criteria for market weights in each sub-fund (and distribution within PAIF) are based on (a) the size of the local market; (b) the turnover ratio in that market; (c) the sovereign credit rating; and (d) a market openness factor. The market weights will be reviewed annually, with market openness being a particularly important factor in the allocation of weights (Ma and Remolona, 2005). The parent fund is limited to investments by EMEAP member central banks only. While the initial phase of PAIF was confined to investments by EMEAP central banks only (US$1 billion), it was opened up to investments by other retail investors in Phase 2.

In broad terms, the objectives of the ABF are four-fold. The first is to diversify debt financing from bank lending to bond financing by developing regional financial/capital markets by reducing supply side constraints, introducing low cost products, raising investor awareness and broadening investor base on the demand side. The second is to encourage a convergence in financial and capital market policies, and accelerate improvements in financial market infrastructures. The third is to recycle regional funds intraregionally and also reduce the region's vulnerability to "fickle" international investors. The fourth is to lessen the extent of currency and maturity mismatches (that is, "double mismatches"). Since we have already discussed the first two objectives (also see Ma and Remolona, 2005 and Hamada et al., 2004), we elaborate on the latter two objectives below.

As is commonly noted, Asia as a whole holds the bulk of the world's savings. The excess of savings over investment along with quasi-managed exchange rates has given rise to large current account and overall balance of payments surpluses. Historically, the lack of sufficiently liquid financial instruments has led to much of Asia's savings being rechannelled outside the region, especially to the United States. In relation to this, it is often noted that one of the reasons for the intensification of the regional financial crisis of 1997-98 was the fickleness of international investors, many of whom were extra-regional ones who did not have much knowledge about regional economies or differences in economic fundamentals between the economies. There was significant "panic herding" during that period as international creditors and investors chose to reduce exposures to all regional economies *en masse* once they were spooked by the crisis in Thailand and Indonesia, leading to a massive international bank run. Insofar as the ABF proposal promotes greater intraregional financing, this might make the region somewhat less susceptible to extra-regional "investor ignorance" which is said to have contributed to an indiscriminate and disorderly withdrawal of funds from regional markets in 1997-98.

Another source of vulnerability made apparent by the 1997-98 financial debacle arose due to large-scale accumulation of uncovered external debt. To the extent that a relatively larger proportion of a country's liabilities is denominated in foreign currency vis-à-vis its assets (so-called "liability dollarisation"), a currency devaluation could lead to sharp declines in the country's net worth, with calamitous effects on the financial and real sectors (so-called "balance sheet" effects).[17] On the part of the developing Asia-Pacific economies, the ability to issue bonds in domestic currencies mitigates the concerns about currency mismatches (that is, borrowing and interest payments in foreign currency but assets and revenue streams in

[17] The macroeconomic implications of these balance sheet effects have been explored by Bird and Rajan (2004) and Rajan (2009, Chapter 7).

local currency) which in turn could negatively impact the project's solvency in the event of a currency devaluation. Thus, while the ABF 1 was solely focused on foreign currency bonds, the ABF 2 is notable in that it involves transacting solely in local currency bonds.

While the ABF is a welcome move for regional financial cooperation, it is important not to oversell the initiative. Why? First and foremost is the quantum of funding available. Second, if the supply of good quality sovereign and quasi-sovereign paper is limited (which appears to be the case), it could merely crowd out private bond purchases, hence leading to no new net financing.[18] This in turn implies the need to support "public providers of infrastructure services in achieving commercial standards of creditworthiness to access capital markets on a sustainable basis over the long term" (World Bank, 2004, p.161). Third, as noted, the ABF to date is only limited to the APT countries. Serious Consideration should be given to expanding it to all the members of the EAS, particularly since the three additional countries of Australia, New Zealand and India have fairly well developed financial markets and expertise that is missing in much of developing East Asia.

4. The Asian Currency Unit

While the Asian Bond Fund initiatives are modest steps in the right direction, a recent suggestion has been floated for an Asia Basket Currency (ABC) Initiative. The basic idea is that while the ABF merely purchases and holds on to sovereign and quasi sovereign bonds, the ABC corporation would also create and issue basket currency bonds (weighted combination of regional currencies of the underlying national bonds) backed by regional sovereign bonds. If successful, the ABC could provide a fillip for the eventual creation of an Asian Currency Unit (ACU). The ACU is, in a general sense, a weighted average of regional currencies *a la* the European Currency Unit (ECU) which was created in March 1979 under the European Monetary System (EMS) and remained in operation until the launch of the Euro in January 1999.[19]

4.1 Rationale for the Asian Currency Unit

At the micro-level the rationale for an ACU is to afford the opportunity for regional economic agents to invoice regional financial and trade transactions in the ACU, hence reducing the region's dependence on the US dollars and other external currencies. If successful, intra-regional intermediation of savings may be promoted, in the process possibly reducing the region's exposure to external shocks as discussed previously. However, in reality, it is unlikely that the ACU will be used on a widespread basis for some time to come.

The experience of Europe is instructive in this regard. The initial creation of the ECU did not lead to a widespread use of the unit. Even in the 1990s, until the actual creation of the Euro, the vast majority of intra-European financial and trade transactions were not in ECUs but in US dollars primarily and other sovereign national European currencies. So it is not just the creation that is important; there has to be a coordinated agreement by regional bodies to start transacting in the new unit, failing which no one will want to take the first step.[20] The ACU

[18] For a more detailed and forceful critique of such regional bond initiatives, see Eichengreen (2004) and Eichengreen and Luengnaruemitchai (2005).

[19] The weights in the ECU were determined primarily by each member's shares in EC-wide GDP, intra-regional trade and total quota of EMS financial support system.

[20] This inertial effect of existing currencies (that is, advantage of incumbency) is based on the concept of "network externalities" or "lock in" effects, whereby there are limited incentives for economic agents to

has a better chance of success (in terms of becoming a significant regional vehicle currency) if a larger set of countries is included in the basket. In this regard it is imperative that the ACU be broadened from the proposed APT countries to also include India, Australia and New Zealand (the other members of the EAS), all of which have significant financial market depth.

It has been suggested that the ACU could be used as a means of enhancing *internal* exchange rate stability if the regional central banks begin to stabilise their respective currencies to the regional unit (that is, helping reduce the possibility of regional competitive devaluations). The notion of stabilisation vis-à-vis an internal basket *a la* Europe's Exchange Rate Mechanism (ERM) is distinct from stabilisation vis-à-vis an external unit which would require that the ACU in turn be pegged in some way to external currencies such as the US dollars or Euro, or some weighted average thereof.

Of course, internal stability does not require the latter and in fact may exacerbate external currency stability. This may happen if regional countries substitute the use of external currencies for the ACU, hence being less concerned about fluctuations of their currencies relative to the external currencies. Conversely, effective external stability requires internal stability in the sense that if regional central banks do not explicitly or implicitly manage their currencies to the ACU, it is irrelevant whether the ACU *per se* is managed against the external currencies, as the proposed ACU will remain purely a theoretical construct. Indeed, the stated aim of the ADB at this stage is for the ACU to serve mainly as a means of benchmarking the extent of currency movements/deviations. As the ADB president, Haruhiko Kuroda, noted:

> The ACU…could be used to monitor the stability of participating currencies and would tangibly demonstrate the need for greater exchange rate coordination. What Asia needs here is basically an exchange rate that is flexible toward the rest of the world but relatively stable within the region (Kuroda, 2005, p.5).

Focussing on the notion of stabilisation vis-à-vis an internal basket (that is, regional currencies benchmarking movements to the ACU), while the potential microeconomic benefits noted above do not require internal stabilisation, the latter could promote the more widespread use of the ACU. This is so as the regional central banks will automatically begin to use the ACU more extensively as a reserve and possibly even intervention currency, thus providing an additional inducement for private agents to intensify use of the unit in invoicing and transactions (also see Eichengreen, 2006).

Needless to say that the long-term viability of internal stabilisation in an era of open capital markets requires there be an enhancement of regional policy dialogue and surveillance, a degree of policy coordination, and an augmentation of regional liquidity arrangements (CMIM noted above). Nonetheless, given the divergence in economic and institutional structures in the region, absent macroeconomic policy coordination and mechanisms for automatic intraregional fiscal transfers, any attempt at formal exchange rate coordination – let alone a full-fledged monetary union – is far too risky and premature, and will likely be a failure, setting back prospects for other forms of economic integration.

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unilaterally take on a new currency (particularly for invoicing transactions). The network aspects of the internal currency status have been analyzed theoretically by Matsuyama et al. (1993).

4.2 Computation of the Asian Currency Unit [21]

While the ACU cannot be viewed as an attractive nominal anchor for Asian currencies in the near-term, it could potentially have a role to play in Asian monetary cooperation in the future.[22] Given its potential usefulness, it would be advantageous to explore the issues surrounding its construction.

Broadly speaking, there are two issues that must be addressed in the construction of a regional currency unit based on currency baskets. First, a decision has to be made as to which national currencies should be included in the currency basket. Second, a decision has to be made as to the weights that are to be accorded to the national currencies included in the currency basket. With regard to the first issue, while there is good reason to start with a sub-set of countries in Asia, it is unclear why this initiative (as well as the ABF and CMIM) should be restricted to the APT. This said, we consider alternative country configurations of the ACU – from the narrow (ASEAN) to the broad (ASEAN+6). The principal interest of this study is the application of a technique that determines the optimal weights in a regional currency basket [23]

Most estimates of the ACU currency weights have been based on some economic indicators across countries. For instance, in a widely cited paper in East Asia, Ogawa and Shimizu (2005) proposed the construction of an Asian regional currency basket as a weighted average of regional currencies *a la* the ECU. They calculate the weights of the national currencies included in the currency basket as an arithmetic average of the country's respective shares of PPP-based GDP and foreign trade.[24]

Hovanov, Kolari and Sokolov (2004) showed that the values of any given currency (for example, British pounds) depend on the base currency chosen (for example, US dollars, Euros, Japanese yen), which creates ambiguity in the valuation of a currency and makes it difficult to examine the dynamics of the time series of currency values. As a matter of caveat, the choice of base currency is critical to obtain a stable exchange rate. For example, using the US dollar as a base currency as opposed to the Japanese yen changes the relationship between the Euro and the British pound. To overcome this base currency problem they proposed a *reduced* (to the moment t_0) *normalised value in exchange* of *i*th currency:

$$\mathrm{RNVAL}_i(t/t_0) = \frac{c_{ij}(t)}{\sqrt[n]{\prod_{k=1}^{n} c_{kj}(t)}} \Bigg/ \frac{c_{ij}(t_0)}{\sqrt[n]{\prod_{k=1}^{n} c_{kj}(t_0)}} = \sqrt[n]{\prod_{k=1}^{n} \frac{c_{ik}(t)}{c_{ik}(t_0)}} \qquad (1)$$

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[21] This section is based on joint work with Victor Pontines (see Pontines and Rajan, 2008).

[22] For instance, Moon, Rhee and Yoon (2007) have argued in favour of the creation of an Asian Exchange Stabilization Fund (AESF). As they observe:

> The objective of the AESF is more comprehensive in that it includes exchange rate stability in addition to liquidity support. In fact, the case of the EMS suggests that three pillars be combined into one institution: ECU, Provision of liquidity, and ERM. Thus, in Asia, once the (A)CU is created and once the provision of emergency liquidity can be strengthened through the CMI, then the next natural step will be to set up an appropriate exchange rate system. This could be carried out with the establishment of the AESF (p. 20).

[23] Also see Sen Gupta and Patel (2008) who independently study the feasibility of the ACU and stress that the initiative should be expanded to include India in particular, but also Australia and New Zealand.

[24] Regular updates of their computations are available here: http://www.rieti.go.jp/users/amu/en/.

where $c_{ij}(t)$, $i,j = 1, \ldots, n$, are cross-currencies of exchange rates of n currencies at the moment t. By dividing through by the geometric mean of a basket of currencies, the value of any currency is the same regardless of the base currency chosen. This *reduced normalised value in exchange (*$\text{RNVAL}_i(t/t_0)$) of a currency is useful in comparing the movements of individual currencies and basket currencies. Why? Typically, one makes statements like "the US dollar appreciates against the yen but depreciates against the Euro". In contrast, if the *reduced normalised value in exchange* of the US dollar rises, it means that the value of the US dollar rises on average against the national currencies used in the computation of the geometric mean of the basket of national currencies (Hovanov, Sokolov and Kolari, 2004).[25]

4.3 Empirics

We relegate details of the model to the Annex and focus here on the results. The data are sourced from the Pacific Exchange Rate Service website (fx.sauder.ubc.ca) and monthly cross rates of Asian and Pacific currencies are generated for the period January 2000 to June 2007. We consider alternative sets of Asian and Pacific national currencies to be included in a regional currency basket – ranging from a smaller core of ASEAN 5 countries (Indonesia, Malaysia, Philippines, Singapore and Thailand) all the way to a much broader set of coverage of national currencies that include the ASEAN 5 + 3 (China, Korea, Japan) + India + Australia + New Zealand. We also consider a regional currency basket that excludes Japan from the set of countries, as it is unclear whether the Japanese yen should be treated as an 'insider' or as an 'outsider' (external) currency in a future regional currency basket arrangement (Kriz and Thai, 2006 and Ogawa and Kawasaki, 2006).

The detailed list of each of the national currencies that comprise a particular currency basket as well as their respective calculated optimal basket weights (w^*) are shown in Table 1. The reported optimal basket weights arise from the optimisation method with Eq. (2) in the Annex as the objective function. In other words, we are minimising the variance of any alternative set of national currencies that comprise a certain regional currency basket (such as those listed in Table 1), wherein the values of these same alternative set of national currencies are cast in terms of their *reduced normalised value in exchange* (which is a concept not dissimilar to effective exchange rates). An examination of the results suggests four discernible patterns.

First, when the core consists of ASEAN 5 only, there is a high degree of uniformity in weights, with each of the currencies constituting around 20 percent of the regional currency basket.

Second, when the currency basket is made up of the core ASEAN 5 + 2 (China + Korea), the Singapore dollar is assigned the highest weight of 19.3 percent, while the Philippine Peso and Malaysian ringgit has the lowest weight of 11.4 percent. China and Korea together constitute about 30 percent of the currency basket. However, once the Japanese yen is treated as an insider in the basket (ASEAN 5 + 3), the Singapore dollar is still accorded the highest weight of 15.3 percent, though this time the Indonesian rupiah is accorded the lowest weight of 10 percent. China, Korea and Japan now constitute around 40 percent of the currency basket.

Third, irrespective of whether the Japanese yen is treated as an insider or as an external currency, when the currency basket is enlarged to include the Indian rupee, interestingly, the

[25] The concept is, therefore, not too dissimilar to that of the effective exchange rate.

weights across countries are fairly even at around 10-15 percent each. When Japan is excluded, China, Korea and India constitute around 40 percent of the currency basket. When Japan is included, these four countries constitute about 55 percent of the regional basket.

Fourth, in a broader currency basket that includes ASEAN plus China, Korea, India, Australia and New Zealand, the Indian rupee and Singapore dollar are accorded the highest weights while the Philippine Peso and Malaysian ringgit gets the lowest weight (again, this is so regardless of whether the Japanese yen is included or excluded from these currency baskets). Australia and New Zealand constitute between 15 and 20 percent of the regional basket.

By no means are we suggesting that the above methodology is fool-proof. The relevant point is that one needs to consider issues relating to risk and stability (proxied by variances and covariances) along with more conventional measures such as relative size of economies, trade, etc. Ideally, some combination of the two, that is, size and stability, should be considered in determining appropriate (if not optimal) currency weights of the ACU.[26]

5. Conclusion

There are a number of factors that have motivated monetary and financial regionalism in Asia.

The first has been the financial crisis of 1997-98 and the perceived inadequate response to it from extra-regional players. Added to this are the ongoing concerns about under-representation of Asia in IMF quota distribution (despite marginal adjustments to increase China's share) and Asia's apparent lack of voice in international monetary affairs, along with the belief that Asia has ample resources for regional self-help. As noted by Henning (2005):

> Dissatisfaction with the multilateral regime is not likely to be sufficient to produce substantial movement toward financial regionalism. Convergence of preferences with partners, the ability to come to agreement, the physical or financial capacity to launch common projects, and a degree of economic interdependence are also likely to bear on regionalism. Thus, regions are likely to respond in different ways to a common multilateral environment. Nonetheless, dissatisfaction with the systemic context is a necessary requirement for investment of energy and political resources in regional projects; if the multilateral regime satisfies governments, regional projects would be superfluous (p.5).

The second has been external developments in regionalism, particularly the deepening and broadening of the European Union (EU). To be sure, many economists have remained circumspect about the potential benefits of deeper monetary integration in Asia (do the microeconomic benefits outweigh the macroeconomic costs arising from loss of monetary policy sovereignty?), and there are signs of emerging tensions within the EU regarding the net benefits of a single currency. Nevertheless, there is no doubting the inspiration that many

[26] For instance, see the critique of the Hovanov, Sokolov and Kolari (2004) methodology by Siegmann (2004). We have also excluded the other ASEAN members (Brunei, Cambodia, Laos, Myanmar and Vietnam) because of the lack of data.

Asian policy makers have drawn from the deepening and broadening of European regionalism, especially in the monetary and financial areas.

The third has been the growing *de facto* economic interdependence (so-called "market driven regionalism") as well as the regional nature of spillovers ("contagion"). The sudden and vicious contagion from the financial crisis in the developed world (the United States and the United Kingdom, in particular) to emerging markets in Asia and elsewhere (especially post Lehman Brothers collapse in September 2008) has reiterated the need to ensure that countries have adequate pools of liquidity as a crisis insurance mechanism.

At a global level, the IMF has clearly recognised the need for such liquidity facilities with the creation of Flexible Credit Line (FCL) in 2009.[27] The FCL is described on the IMF website as follows:

> The FCL is for countries with very strong fundamentals, policies, and track records of policy implementation and is particularly useful for crisis prevention purposes. FCL arrangements are approved for countries meeting pre-set qualification criteria. The length of the FCL is six months or one year (with a mid-term review). Access is determined on a case-by-case basis, is not subject to the normal access limits, and is available in a single up-front disbursement rather than phased. Disbursements under the FCL are not conditioned on implementation of specific policy understandings...There is flexibility to draw on the credit line at the time it is approved, or it may be treated as precautionary.

However, it is not clear how willing emerging Asian economies will be to avail themselves of this new IMF facility in view of the problems some of them had with the IMF during the Asian crisis of 1997-98. Separately, the United States has also signed bilateral swap arrangements with fourteen central banks, including Japan, Korea and Singapore in Asia (currently set to expire on October 2009).[28]

In parallel with all of this, or possibly motivated by these initiatives, the APT Finance Ministers finally agreed to expand and multilateralise the CMI – so-called CMIM – something they had been talking about doing for a number of years. The creation of a *de facto* reserve pool is an important step but will only be truly effective and credible if regional surveillance is significantly enhanced, and plans appear to be underway to do just that. If the CMIM becomes a regional reserve pool and gradually expands in size and membership, it should help reduce the need to continue to build-up reserves aggressively, implying less need to undervalue currencies and would be consistent with the move towards focusing more on domestic and regional demand. If such a set of policies is pursued, that, along with the rise in United States household savings, ought to help reduce the size of the global macroeconomic imbalances and consequently ensure that the next growth cycle is more sustainable

The Asian countries should also persist with attempts to develop well-functioning financial markets and institutions. In particular, countries need to deepen and upgrade national and regional government and corporate bond markets as a means of reducing the region's heavy

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[27] See http://www.imf.org/external/np/exr/facts/howlend.htm. This is the IMF's third attempt at creating such a liquidity facility, the first two attempts being the Contingent Credit Line in 1999 and the Short-Term Liquidity Facility (SLF) in 2008. Both found no takers and were eventually terminated.

[28] See http://www.boj.or.jp/en/type/release/adhoc09/un0902a.pdf .

reliance on banks. Greater attention needs to be given to lowering transactions costs in regional financial markets. In this regard it is important to note that discussions have been underway in the region about the possible creation of regional financial infrastructure (clearing and settlements systems, credit agency) as well as harmonisation of withholding tax policies and capital account policies. While the ABF initiatives are modest steps in the right direction, it is important that it be expanded in size and membership. With regard to the latter, not all the ASEAN countries nor India are part of EMEAP and therefore are not part of the ABF. Expansion of all forms of financial and monetary regionalism in this manner is justified by the fact that the APT countries as well as India, Australia and New Zealand are founding members of the EAS. Apart from economic rationale (such as risk diversification), expansion of regionalism to these economies will also reduce the likelihood of the region experiencing the risk of hegemonic domination by one or two large players over time.

There have been growing calls for greater exchange rate and monetary coordination among Asian economies. It is in this context that there has been active discussion in the region – more specifically the East Asian sub-region – about the possibility of an ACU as a means of promoting a degree of explicit exchange rate stability. Clearly it would be far too premature to consider harmonisation of Asian exchange rate and monetary policies to a common currency basket at this stage (let alone a currency union based on the ACU) when neither the economic nor the political preconditions exist to do so. Attempting rigid policy coordination before the necessary preconditions are met would be like putting the cart before the horse; it is doomed to fail. This said, there remains much interest in the region on examining the role of an ACU and its possible uses, including circulation as a parallel currency, particularly in view of ongoing concerns about the future prospects of the US dollar.

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Annex: Derivation of Minimum Variance Currency Basket[29]

The derivation of the minimum variance currency basket used on Section 4.2 is calculated by searching the optimal weight vector w^* that solves the following optimal control problem:

$$Min\left(S^2(w) = \sum_{i,j=1}^{n} w_i w_j \mathrm{cov}(i,j) = \sum_{i=1}^{n} w_i^2 s_i^2 + 2\sum_{\substack{i,j=1 \\ i<j}}^{n} w_i w_j \mathrm{cov}(i,j) \right) \qquad (2)$$

under the constraints, $w_i \geq 0$, for all $i = 1, \ldots, n$, $w_1 + \ldots + w_n = 1$, where cov(i,j) is the covariance between the *reduced normalised value in exchange rate* or $\mathrm{RNVAL}_i(t/t_0)$ and $\mathrm{RNVAL}j(t/t_0)$, and s_i^2 is the variance of $\mathrm{RNVAL}_i(t/t_0)$ for all i,$j = 1, \ldots, n$ and all $t = 1, \ldots, T$.[30] The optimal weights can also be transformed into optimal currencies' amounts $q_1^*, q_2^*, \ldots, q_n^*$ as follows:

$$q_i^* = \frac{w_i^* \sum_{r=1}^{n} q_r c_{rj}(t)}{c_{ij}(t)}, \qquad \text{Let} \quad \mu = \sum_{r=1}^{n} q_r c_{rj}(t), \quad \text{thus} \quad q_i^* = \frac{w_i^* \mu}{c_{ij}(t)} \qquad (3)$$

Here the positive factor μ can be easily solved from knowledge of the optimal weights $w_1^*, w_2^*, \ldots, w_n^*$ derived from the minimisation of the variance in Eq. (2), and $c_{1j}(t)$, $c_{2j}(t)$, . . ., $c_{nj}(t)$. Substituting μ into Eq. (3) we obtain the optimal currencies' amounts $q_1^*, q_2^*, \ldots, q_n^*$, which constitute the minimum variance currency basket.

What does the technique presented above have to say about the current orthodoxy? For one, a key problem here is that the optimal currency basket weights are dependent on the base currency chosen by the researcher (Hovanov, Kolari and Sokolov, 2004). The use of the concept of the *reduced normalised value in exchange (*$\mathrm{RNVAL}_i(t/t_0)$) of the national currencies included in the regional currency basket avoids the problem of the non-uniqueness of the computed optimal basket weights since their respective *reduced normalised value in exchange (*$\mathrm{RNVAL}_i(t/t_0)$) should be the same irrespective of the choice of base currency.

Accordingly, it follows that the calculation of the optimal weights in a currency basket as determined on the basis of either trade flows, or any arbitrary choice of economic indicators for that matter, invariance to the choice of base currency is not guaranteed to hold. As a result, different optimal weights will be generated for the national currencies included in the currency basket when the US dollar, for instance, is chosen as the base currency compared to when instead the Euro is used as the base currency (for instance, see Sen Gupta and Patel, 2009).

[29] See Pontines and Rajan (2008).

[30] The optimal weights that minimise the variance of a currency basket can be easily computed using familiar optimization methods for diversifying a portfolio of assets. See Hovanov, Kolari and Sokolov (2004) for details.

Since we are minimising a basket or portfolio of assets expressed in terms of national currencies, the currency weights are primarily determined by two main factors, viz. the variance of the *reduced normalised value in exchange (*$\mathrm{RNVAL}_i(t/t_0)$) of the national currencies included in the currency basket; and the covariance of the *reduced normalised value in exchange (*$\mathrm{RNVAL}_i(t/t_0)$) of the national currencies included in the currency basket, and, hence, their correlations.

References

Aizenman, J., and Marion, N., (2003). "The High Demand for International Reserves in the Far East: What's Going On?" *Journal of the Japanese and International Economies*, 17, pp. 370-400.

Bird, G., and Rajan R. S., (2002). "The Evolving Asian Financial Architecture," *Essays in International Economics No.26* (February), Princeton University.

Bird, G., and Rajan, R. S., (2003). "Too Good to be True?: The Adequacy of International Reserve Holdings in an Era of Capital Account Crises," *The World Economy*, 26, pp. 873-891.

Bird, G., and Rajan, R. S., (2004). "Does Devaluation Lead to Economic Recovery or Economic Contraction?: Examining the Analytical Issues with Reference to Thailand," *Journal of International Development*, 16, pp.141-156.

Dayaratna-Banda, O. G., and Whalley, J., (2007). "Regional Monetary Arrangements in ASEAN+3 as Insurance through Reserve Accumulation and Swaps," Working Paper No. 22, The Centre for International Governance Innovation.

Eichengreen, B., (2004). "Financial Development in Asia: The Way Forward," mimeo (January).

Eichengreen, B., (2006). "The Parallel-Currency Approach to Asian Monetary Integration," *American Economic Review*, 96, pp. 432-436.

Eichengreen, B., and Rose, A., (2001). "To Defend or Not to Defend? That is the Question," mimeo (February).

Eichengreen, B., and Luengnaruemitchai, P., (2005). "Why Doesn't Asia Have Bigger Bond Markets?," Working Paper No.10576, NBER.

Frankel, J. and Rose, A., (1998). "The Endongeneity of the Optimum Currency Area Criteria," *Economic Journal*, 108, pp. 1009-1025.

Hamada, K., Jeon, S. C., and Ryou, J. W., (2004). "Asian Bonds Markets: Issues, Prospects and Tasks for Cooperation," paper prepared for the "Korea and the World Economy III" Conference, 3-4 July.

Henning, C. R., (2005). "Systemic Contextualism and Financial Regionalism: The Case of East Asia," mimeo (August).

Henning, C. R., (2009). "The Future of the Chiang Mai Initiative: An Asian Monetary Fund?" Policy Brief No.PB09-5, Peterson Institute, Washington, D. C.

Hovanov, N. K., Kolari, J., and Sokolov, M., (2004). "Computing currency invariant indices with an Application to Minimum Variance Currency Baskets," *Journal of Economic Dynamics and Control*, 28, pp. 1481-1504.

Ito, T., (2003). “The ABC of Asian Bonds,” paper presented at the Second PECC Finance Forum Conference (Hua Hin, Thailand, 8-9 July).

Ito, T., and Park, Y. C., eds. (2004). *Developing Asian Bond Markets*, Canberra: Asia Pacific Press.

Kawai, M., (2006). “Creating an Asian Currency Unit,” *The Japan Journal*, 3, September.

Keil, M., Rajan, R. S., and Willett, T. D., (2009). “Financial Interdependence, Capital Mobility and Monetary and Exchange Rate Cooperation in Asia,” mimeo, June.

Kim, J. S., Li, Jie, Sula, O., and Willett, T. D., (2005). “Reserve Adequacy in Asia Revisited: New Benchmarks Base on the Size and Composition of Capital Flows,” in *Monetary and Exchange Rate Arrangement in East Asia*, Seoul: Korea Institute for Economic Policy.

Kriz, P. N., and Thai, Q. T., (2006). “Alternative Monetary Arrangements for Asia: A Perspective from a Multi-Country Model,” mimeo, July.

Kumar, N., (2005). “Towards a Broader Asian Community: Agenda for the East Asia Summit,” Discussion Paper No. 100, Research and Information System for Developing Countries (RIS), New Delhi.

Kuroda, H., (2005). “Towards a Borderless Asia: A Perspective on Asian Economic Integration,” speech by Asian Development Bank (ADB) President at the Emerging Markets Forum (10 December Oxford).

Ma, G., and Remolona, E. M., (2005). “Opening Markets Through a Regional Bond Fund: Lessons from ABF2,” *BIS Quarterly Review*, June, pp. 81-92.

Matsuyama, K., Kiyotaki, N., and Matsui, A. (1993). “Toward a Theory of International Currency,” *Review of Economic Studies*, 60, pp. 283-307.

Moon, W., Rhee, Y., and Yoon, D., (2007). “Regional Currency Unit in Asia: Property and Perspective,” mimeo, Korea Institute for International Economic Policy, Seoul.

Ogawa, E., and Kawasaki, K., (2006). “Adopting a Common Currency Basket Arrangement into the ASEAN Plus Three,” Discussion Paper No. 06-E-028, REITI, Tokyo.

Ogawa, E., and Sakane, M., (2006). “The Chinese Yuan after the Chinese Exchange Rate System Reform,” Discussion Paper No. 06-E-019, REITI, Tokyo.

Ogawa, E., and Shimizu, J., (2006). “Stabilization of Effective Exchange Rates under Common Currency Basket Systems,” Working Paper No. W12198, NBER.

Ogawa, E., and Shimizu, J., (2007). “Progress toward a Common Currency Basket System in East Asia,” Discussion Paper No. 07-E-002, REITI, Japan.

Park, Y. C., (2004). “Beyond the Chiang Mai Initiative: Prospects for Regional Financial and Monetary Integration in East Asia,” paper prepared for meeting on G-24, September.

Pontines, V., and Rajan, R. S., (2008). "The Asian Currency Unit: Exploring Alternative Currency Weights," *Macroeconomics and Finance in Emerging Market Economies*, 1, pp. 269-278.

Rajan, R. S., (2003). "Safeguarding Against Capital Account Crises: Unilateral, Regional and Multilateral Options for East Asia," in de Brouwer, G., (ed.), *Financial Governance in East Asia*, London: Routledge.

Rajan, R. S., (2005). "Asian Economic Cooperation and Integration: Sequencing of Financial, Trade and Monetary Regionalism," in *Asian Economic Cooperation and Integration: Progress, Prospects and Challenges*, Manila: Asian Development Bank.

Rajan, R. S., (2008). "Monetary and Financial Cooperation in Asia: Taking Stock of Recent On-goings," *International Relations of the Asia-Pacific*, 8, pp. 31-45.

Rajan, R. S., (2009). *Exchange Rates, Currency Crisis and Monetary Cooperation in Asia*, Hampshire: Palgrave-MacMillan Press.

Rajan, R. S., and Siregar, R., (2001). "Private Capital Flows in East Asia: Boom, Bust and Beyond," in de Brouwer, G., (ed.), *Financial Markets and Policies in East Asia*, London: Routledge.

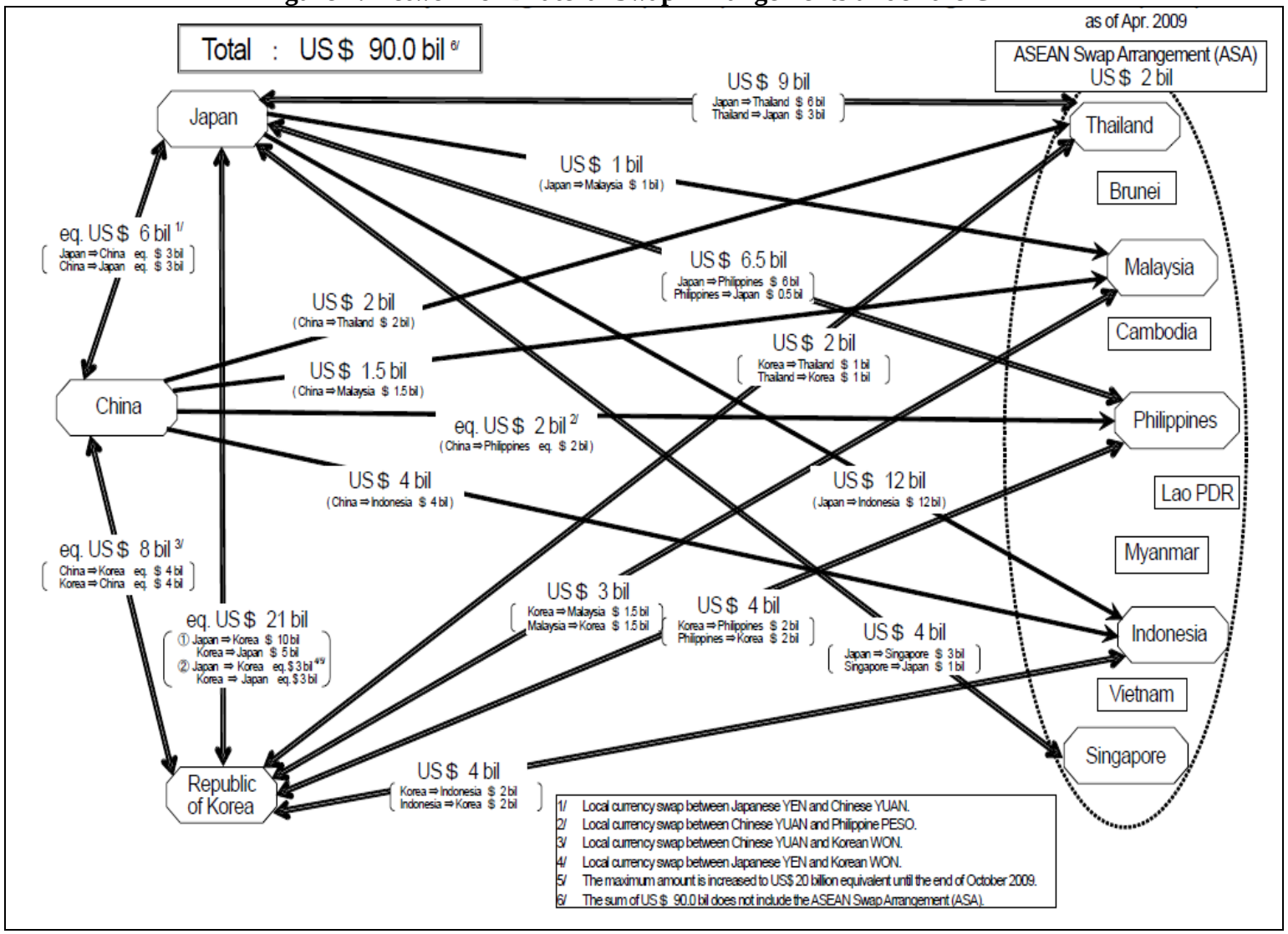
Rajan, R. S., and Siregar, R., (2004). "Centralized Reserve Pooling for the ASEAN Plus Three (APT) Countries," in *Monetary and Financial Cooperation in East Asia*, Palgrave-McMillan Press for the Asian Development Bank.

Siegmann, A. (2004). "Comment on Hovanov, Kolari and Sokolov: A Stable Currency Numeraire?" *Journal of Economic Dynamics and Control*, 28, pp.1505-1510.

Sengupta, A., and Patel, A., (2008). "Feasibility of an Asian Currency Unit," Working Paper No.208, ICRIER, New Delhi.

World Bank (2004). *Global Development Finance*, Washington, D. C.: World Bank.

Figure 1: Network of Bilateral Swap Arrangements under the CMI



Source: http://www.mof.go.jp/english/if/CMI_0904.pdf.

Table 1: Optimal Basket Weights for Various Groupings of Regional Basket Currencies, January 2000 - June 2007 (in percent)

ASEAN 5	Indonesian Rupiah	Philippines Peso	Malaysian Ringgit	Singapore dollar	Thai Baht						
	17.4	18.3	21.8	20.9	21.6						
ASEAN 5 + 2	Indonesian Rupiah	Philippines Peso	Malaysian Ringgit	Singapore dollar	Thai Baht	Korean Won	Chinese Renminbi				
	11.9	12.6	11.4	19.3	13.0	15.0	16.8				
ASEAN 5 + 2 + India	Indonesian Rupiah	Philippines Peso	Malaysian Ringgit	Singapore dollar	Thai Baht	Korean Won	Chinese Renminbi	Indian Rupee			
	10.0	11.2	10.9	15.1	13.2	12.6	13.5	13.5			
ASEAN 5 + 2 + India + Australia + New Zealand	Indonesian Rupiah	Philippines Peso	Malaysian Ringgit	Singapore dollar	Thai Baht	Korean Won	Chinese Renminbi	Indian Rupee	Australian Dollar	New Zealand Dollar	
	7.6	6.8	5.2	13.4	11.7	10.4	11.0	14.2	10.3	9.5	
ASEAN 5 + 3	Indonesian Rupiah	Philippines Peso	Malaysian Ringgit	Singapore dollar	Thai Baht	Korean Won	Chinese Renminbi	Japanese Yen			
	10.0	11.2	11.5	15.3	13.7	12.6	13.3	12.3			
ASEAN 5 + 3 + India	Indonesian Rupiah	Philippines Peso	Malaysian Ringgit	Singapore dollar	Thai Baht	Korean Won	Chinese Renminbi	Japanese Yen	Indian Rupee		
	9.0	9.9	9.8	14.0	11.7	11.1	11.3	10.3	13.0		
ASEAN 5+3+India+ Australia+New Zealand	Indonesian Rupiah	Philippines Peso	Malaysian Ringgit	Singapore dollar	Thai Baht	Korean Won	Chinese Renminbi	Japanese Yen	Indian Rupee	Australian Dollar	New Zealand Dollar
	7.0	6.0	4.5	12.6	10.9	9.6	9.6	8.3	13.7	9.3	8.4

Source: Pontines and Rajan (2008).