# Exchange Rate Coordination in Asia: Evidence using the Asian Currency Unit

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**Abstract**

This paper evaluates the extent of exchange rate coordination among Asian economies using a hypothetical Asian Currency Unit. Rising interdependence among Asian economies makes it vital for these economies to have a certain degree of exchange rate stability. However, the empirical evidence using an Asian Currency Unit suggests a widening deviation in exchange rate movements of the Asian currencies. The deviation has been driven by the adoption of different exchange rate regimes by the participating countries indicating diverse policy objectives. There are a number of institutions in the region that can assist exchange rate coordination and greater economic and financial integration. These institutions, including a multilateralized swap arrangement, a regional surveillance mechanism, and a bond fund; have to be significantly strengthened for them to play a role in fostering greater economic cooperation. The denomination of financial assets in the Asian Currency Unit in transactions involving these institutions would also enhance exchange rate cooperation.

**JEL classification: F36, F55, F15**

In this report, $ refers to US$, unless otherwise stated.

# Contents

# 1.  INTRODUCTION

Economic integration in Asia has evolved in a significantly different manner than it did in Europe. In Europe, economic integration was driven by a top down approach through coordinated initiatives and the creation of regional institutions with the objective of creating a united front across various countries. In contrast, in Asia, market forces have driven economic integration. The market forces have taken the form of individual firms deciding on the location of business, the sourcing of parts and raw materials, the destination of the final product, and the hiring of workers, among others. This has led to a rise in intraregional trade reflecting intra-industry processing and assembly through vertically integrated production. IMF (2007) shows that while trade flows in the rest of the world increased by 3 times between 1990 and 2006, in emerging Asia inter-regional trade rose by 5 times, and intraregional trade increased by 8.5 times. By 2006, trade between the emerging Asian economies had increased to more than 40%, from 30% of total exports in 1990. A supportive economic policy initiated by Asian governments to open up the economy, attract investment, and promote exports has hastened the integration. The trade and investment nexus has been greatly enhanced by the pursuit of the "flying geese" pattern, and this has played an important role in fostering growth in the region.[1]

The rising interdependence among Asian economies is making it paramount to ensure a degree of exchange rate stability among the Asian economies. However, this will be challenging in a global environment that has been increasingly volatile since the subprime crisis in the United States in 2007. The lure of developing Asia's strong fundamentals along with the uncertainty in the global environment reducing global investors' risk appetite will lead to increased volatility in capital flows. In this context, greater exchange rate flexibility vis-à-vis the developed economies will help countries to maintain macroeconomic and financial stability. Thus Asian economies could gain from pursuing a strategy whereby they maintain relatively stable exchange rates within the region and allow greater flexibility against extra-regional currencies. This would require a certain degree of exchange rate policy coordination (Kawai 2010).

One way to go about greater exchange rate coordination is to have a regional currency as the anchor. Given the size of their economies, Japan and People's Republic of China (the PRC) could possibly take on this role. While Japan is one of the dominant economies of the region and has a currency that is fully convertible, its growth rate since the early 1990s has been an issue of concern. On the other hand, the PRC has experienced rapid growth over the past two decades, and has taken steps towards internationalization of the yuan. However, the yuan continues to be tightly managed and has a long way to go before it can become fully convertible. Hence, as pointed out in several studies such as Kawai and Takagi (2005), Ogawa and Shimizu (2007) and Girardin and Steinherr (2008), it would be appropriate to create a basket of appropriately weighted regional currencies.

Most of these studies propose the creation of an Asian Currency Unit (ACU) as a basket of 13 regional currencies, comprising the ten members of the Association of Southeast Asian Nations (ASEAN), the PRC, Japan, and the Republic of Korea (henceforth, Korea). Kuroda and Kawai (2002) point out that such a basket would help to monitor the collective movement of the participating currencies vis-à-vis external currencies as well as the movement of the individual

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[1] The flying geese paradigm, based on global division of labor on the basis of dynamic comparative advantage, argues that the Asian economies will converge to the advanced Western economies through a process of regional hierarchy with production of goods shifting from the more advanced countries to the less advanced ones.

currencies compared to the regional benchmark. The regional benchmark could also be used to denominate regional assets and transactions such as bonds, loans, bank deposits, and foreign exchange deposits. This would also help to mitigate the region's overwhelming dependence on the US dollar that was a proximate cause in accentuating global imbalances in the 2000s.

The theory of an optimum currency area argues that countries that are affected by shocks in a symmetric manner should form a common currency area (Mundell 1961). Countries facing asymmetric shocks can also attempt to form a common currency area, if there is a sufficient degree of price flexibility and high labor and capital mobility to ensure that there are no persistent pockets of unemployment. Other criteria include similarity of preferences over output inflation trade-off and provision of supporting policies like fiscal transfers. However, Frankel and Rose (1998) point out that some of the traditional prerequisites for establishing a common currency area can develop after countries have established a currency area by fixing their exchange rates. The establishment of a common currency area can lead to an increase in the degree of economic integration as well as symmetry of economic shocks. Thus, as long as participating countries exhibit a strong commitment to the coordination of exchange rate policies, their attempt can be successful provided they meet the criteria to some extent initially.

Eichengreen and Bayoumi (1999) focus on trade and foreign direct investment (FDI) integration and the speed of adjustment to shock and symmetric supply and demand disturbances, and conclude that the region satisfies the standard criteria. Kawai and Motonishi (2004) point out that a number of East Asian countries have witnessed a rapid increase in intraregional trade. Another prerequisite is the degree of factor market integration. In Asia, there is a great deal of variation in the degree of labor market integration. Economies like Japan and Korea tend to maintain tight restrictions on labor mobility. On the other hand, the Southeast Asian economies of Thailand, Malaysia, and Singapore are characterized by greater labor mobility. Eichengreen and Bayoumi (1999) and Goto and Hamada (1994) note that labor markets are more flexible in Asia than they were in Europe in the early 1990s, when it embarked on a common currency.

Economic fundamentals suggest that some countries in Asia are more suited to undertake greater exchange rate coordination. While greater exchange rate coordination helps in significantly reducing transaction costs involved with international trade as well as reducing exchange rate uncertainty and the scope of speculation on changes in bilateral exchange rates that can result in instability in foreign exchange markets and have negative effects on countries' internal and external balances, it also imposes a constraint on monetary policy, which is an important tool for stabilizing economy. However, the introduction of an ACU as a parallel currency while providing the benefits of exchange rate coordination will alleviate the costs by allowing some degree of monetary policy autonomy.

# 2. AN ASIAN CURRENCY UNIT

A key issue in the formulation of an ACU is the inclusion of participating currencies. The participating currencies have varied across different studies. Most of the studies such as Ogawa and Shimuzu (2005), Ogawa and Yoshimi (2008) and Wyplosz (2010) have focused on the currencies of the ASEAN+3 countries.

This paper expands the set of participating countries to include Hong Kong, China; and India. Hong Kong, China has already established close trade and financial links with other East Asian economies, especially the PRC. Furthermore it has been a part of a number of regional initiatives like the Executives' Meeting of East Asia Pacific Central Banks (EMEAP) and the Chiang Mai Initiative Multilateralization (CMIM). In contrast, India is still not a member of these initiatives and is not as closely linked to the East Asian economies. However, given that the

process of exchange rate coordination is a long process, there is a need to have a dynamic outlook for the region. At its current growth rate, India is expected to be among the top three economies of the region during the next three decades. Furthermore, in recent years India has sought to increase its trade and financial links with other Asian economies. According to the International Monetary Fund's (IMF) Direction of Trade Statistics, India's exports to the region increased from 19% in 2001 to 26.3% in 2011 while its imports increased from 18.2% to 27.7%. Trade links are likely to increase given that India has signed or is negotiating trade agreements with ASEAN, Indonesia, Japan, Malaysia, Singapore, and Thailand. Similarly, several Asian economies including Japan, Korea, and Singapore have invested in India's infrastructure, automobiles, electronics financial, pharmaceutical, logistics, and information technology sectors.

After finalizing the composition of the currency basket, the next step is to assign weights to the various participating currencies. The choice of the economic indicators to assign weights can be complicated, as they would need to reflect both the current and the potential size of the economy, and the extent to which the country will use the ACU. Thus weights assigned are based on the average of the individual country's share in the regional gross domestic product (GDP) measured at purchasing power parity, intraregional trade, and intraregional investment. While GDP measured at purchasing power parity is an indicator of the potential size of the economy, trade and investment based weights provide an indication about the extent to which participating currencies could employ the ACU.

Table 1 highlights the weights accorded to the 15 economies according to the average GDP based on purchasing power parity, intraregional trade, and investment. Thus one unit of the ACU would include $0.23 equivalent of yen, $0.28 equivalent of yuan, $0.12 equivalent of Hong Kong dollar, $0.09 equivalent of won and so forth. Given the bilateral exchange rate between the Asian currencies and the US dollar it implies that the ACU would comprise 25.6 units of yen, 2.2 units of yuan, 0.85 units of Hong Kong dollar, 103.0 units of won, and so on.

Next, to evaluate the collective movement of the participating currencies against the numèraire currency and the relative movement of these currencies against the ACU a base period needs to be identified. The base period is chosen as a year when the deviations among the important macroeconomic indicators are least. The rationale is that members of a common currency area need to follow a coherent set of domestic policies for the common currency area to be stable. The Maastricht convergence criteria for joining the European Economic and Monetary Union were established precisely for the purpose of ensuring coherent policymaking. It focused on convergence of government deficits, government debt, inflation rates, exchange rates, and long-term interest rates. To analyze external and internal stability we focus on these indicators as well as current account deficits and find that the divergence among these indicators was least in 2000 and 2001, and take them as the base period.

The US continues to be the dominant trade partner outside the region for most of the economies. The countries of the eurozone are the other major trading partners. The ongoing crisis in the eurozone has created a lot of uncertainty about the prospects of the euro continuing at least in its present form. Nevertheless, given the size of the economies in the eurozone, and their existing trade linkages with the Asian economies, it is evident that these economies will continue to be major trading partners even if some alternative exchange rate arrangement is formulated in the eurozone. Consequently, we include both the US dollar and the euro in the numèraire currency basket. Based on their trade shares between 2004 and 2007 the currency basket is made up of 60% of the US dollar and 40% of euro. It is assumed that 1 unit of the ACU is equivalent to 1 unit of the numèraire currency basket in the base period.

**Table 1: Weights and Shares of Participating Currencies in the Asian Currency Unit**

|  | Average Weights (%) | Base Period Average Exchange Rate | Units |
|---|---|---|---|
| Brunei Darussalam | 0.12 | 1.7 | 0.002 |
| Cambodia | 0.10 | 3697.7 | 3.603 |
| PRC | 27.98 | 8.0 | 2.237 |
| Hong Kong, China | 11.33 | 7.5 | 0.853 |
| India | 8.49 | 44.5 | 3.776 |
| Indonesia | 3.82 | 9006.8 | 343.855 |
| Japan | 23.15 | 110.7 | 25.629 |
| Republic of Korea | 8.82 | 1168.6 | 103.013 |
| Lao PDR | 0.06 | 8219.5 | 4.695 |
| Malaysia | 4.82 | 3.7 | 0.177 |
| Myanmar | 0.24 | 6.3 | 0.015 |
| Philippines | 1.37 | 46.0 | 0.629 |
| Singapore | 5.01 | 1.7 | 0.085 |
| Thailand | 3.53 | 40.9 | 1.443 |
| Viet Nam | 1.19 | 13986.3 | 166.131 |

Lao PDR = Lao People's Democratic Republic;  PRC = People's Republic of China.

Notes: The benchmark exchange rate is the average of the daily exchange rate in terms of the US dollar in 2000 and 2001. The GDP and trade weights are based on average weights between 2004 and 2007.

Sources: World Development Indicators; IMF's Direction of Trade Statistics and Coordinated Portfolio Investment Survey databases. Available at http://elibrary-data.imf.org/ and http://data.worldbank.org/data-catalog/world-development-indicators

(accessed 10 January 2012).

Based on economic size, an exchange rate of the Asian Currency Unit is calculated in terms of the US dollar according to

$$\varepsilon_{\text{ACU,t}}^{Num} = \sum_i w_i \varepsilon_{\text{i,t}}^{Num} \tag{1}$$

where

$\varepsilon_{\text{ACU,t}}^{Num}$ is the value of the ACU in terms of the numèraire currency basket at time t i.e. the number of units of the numèraire currency basket that can be bought with one unit of the ACU,

$w_i$ is the share of the i$^{th}$ currency in ACU, and $\varepsilon_{\text{i,t}}^{Num}$ is the value of the i$^{th}$ currency in terms of the numèraire currency at time t.

Figure 1 shows that the ACU appreciated by about 10% between 2001 and 2011. However, the ACU did not strengthen in a monotonic manner. There was a decline in the value of the ACU vis-à-vis the numèraire basket by about 10% between 2001 and mid 2003. This was largely due to the weakening of the yen and the yuan, which have a combined weight of nearly 50% in the ACU, against the numèraire basket. The ACU was relatively stable between mid-2003 and late 2006. Most Asian currencies were relatively stable vis-à-vis the numèraire basket during this period. The only exceptions were the rupiah, which weakened by 12% and the won, which strengthened by 18.5%.

**Figure 1: Movement of the Asian Currency Unit against the US Dollar**



Source: Author's calculations.

Since late 2006, the ACU strengthened by 17% against the numèraire basket. During this period the yen appreciated against the euro by 39% and against the US dollar by 51%. The yuan, which had abandoned the tight peg in July 2005, also appreciated by 24% against the US dollar between September 2006 and 2011. Other Asian currencies, which experienced significant strengthening against the numèraire basket, include the Singapore dollar, the baht, and the ringgit. The Brunei dollar, by virtue of the currency board arrangement with Singapore dollar, and kip also appreciated during this period. On the other hand, currencies that became weaker over this period include the won, the Indian rupee and the dong.

A regional currency unit would also help to monitor the movement of the participating currencies against the regional benchmark and analyze the co-movement of the participating currencies. To monitor the movement of the participating currencies we use the following arbitrage condition

$$\varepsilon_{i,t}^{ACU} = \varepsilon_{i,t}^{Num} \varepsilon_{Num,t}^{ACU} \qquad (2)$$

The above condition states that the value of a participating currency in terms of the ACU is a product of the bilateral exchange rate between the currency and numèraire basket and the value of the numèraire basket in terms of the ACU. Following Ogawa and Shimuzu (2005) we look at the percentage deviation of these currencies from the ACU relative to the base period to trace the movement of individual participating regional currencies relative to the ACU. We define percentage deviation $D_{i,t}$ as

$$D_{i,t} = \frac{\varepsilon_{i,t}^{ACU} - \varepsilon_{i,0}^{ACU}}{\varepsilon_{i,0}^{ACU}} \qquad (3)$$

Here $\varepsilon_{i,0}^{ACU}$ is the value of the participating currency in terms of the ACU in the base period. The base period value is calculated by taking annual average of the daily values. Figure 2 traces the percentage deviation of the participating currencies vis-à-vis the ACU. It is evident that there is a lot of divergence in the performance of the individual currencies against the ACU.

As evident from Figure 2, due to the high weight accorded to the yuan and the yen in the construction of the ACU, these currencies have remained relatively steady against the ACU through most of the period. The yuan strengthened by about 10% between December 2007 and February 2009, but lost most of this gain by 2011. The yen weakened by nearly 15% between January 2005 and July 2007 but since then has appreciated by over 30%. In December 2011, the yen was nearly 20% stronger vis-à-vis the ACU compared to the base period. The Hong Kong dollar, by virtue of being pegged to the US dollar, depreciated by about 18% between 2006 and 2011. The movement of the ringgit closely paralleled that of the yuan till mid 2005 due to both their currencies being pegged to the dollar. Thereafter the ringgit continued to be relatively stable against the ACU moving in a narrow band. The won strengthened by nearly 24% between January 2004 and December 2006 but depreciated considerably thereafter to be weaker by 23% in March 2009 compared to its base period value. It regained some of these losses in the subsequent years. The baht also appreciated nearly 30% vis-à-vis the ACU between July 2005 and July 2007. While it witnessed some weakening in the aftermath of the global financial crisis, it was nearly 12% stronger in 2011 compared to the base period. The Singapore dollar and the Brunei dollar strengthened by nearly 12% between mid 2005 and 2011 with some moderation during the global financial crisis.

**Figure 2: Nominal Deviation of the Participating Currencies vis-à-vis the**
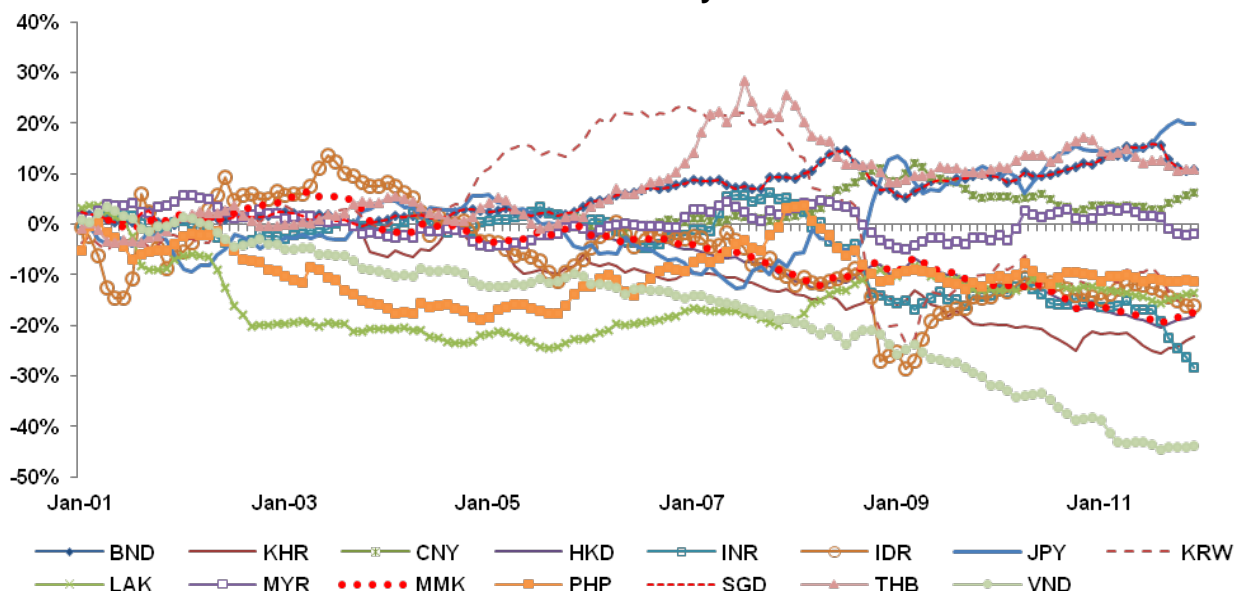
**Asian Currency Unit**



BND=Brunei dollar; KHR=riel; CNY=yuan; HKD=Hong Kong dollar; INR=Indian rupee; IDR=rupiah; JPY=yen; KRW=won; LAK=kip; MYR=ringgit; MMK=kyat; PHP=Philippine peso; SGD=Singapore dollar; THB=baht; VND=dong.

Source: Author's calculations.

The Philippine peso had weakened by nearly 19% between 2001 and December 2004, but regained most of these losses prior to the onset of the global financial crisis. However, since mid-2008, the Philippine peso has again depreciated by 12% vis-à-vis the ACU. The rupiah exhibited considerable volatility between 2001 and 2003 and strengthened by nearly 14% during this period. However, subsequently, it witnessed a steady depreciation and was nearly 24% weaker in February 2009 compared to the base year period. In recent years it has witnessed some appreciation. The Indian rupee had been relatively stable against the ACU during 2001 to 2007. However, since the onset of the crisis, the Indian rupee has witnessed a continuous
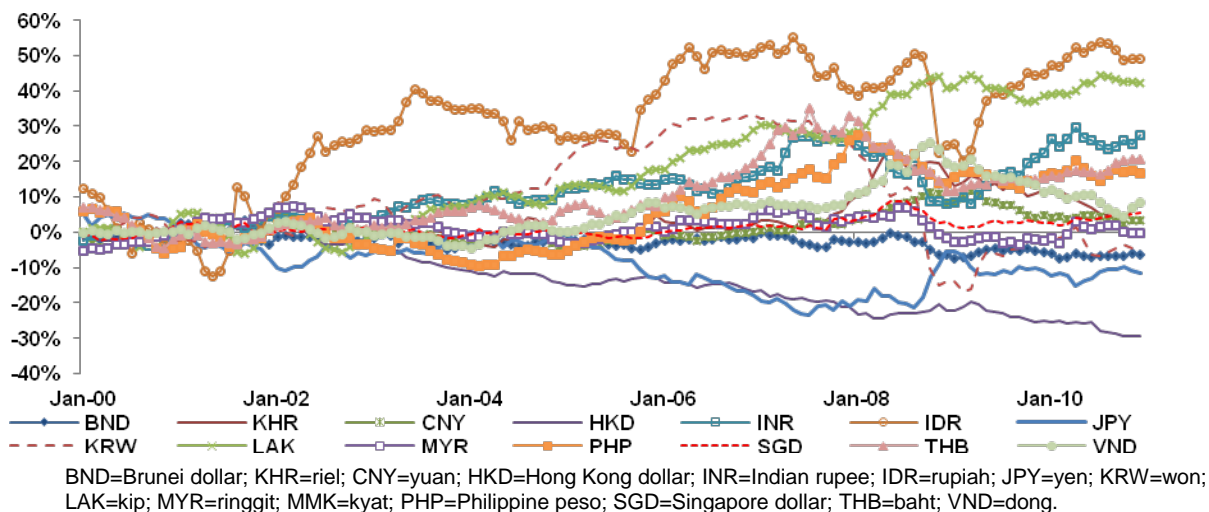
decline weakening by nearly 29% between 2008 and 2011. The riel declined nearly 24% between 2004 and 2011, having remained relatively steady against the ACU during 2001 to 2003. In contrast, the dong experienced sustained depreciation pressures through the period covered and weakened by more than 45% between 2001 and 2011. Some of the other currencies such as the kip and the kyat also depreciated moderately against the ACU.

One possible reason for the large disparity in exchange rate movements of the participating currencies could be varying inflation rates in these countries. Many countries might aim to have a stable exchange rate and hence use exchange rate movements to compensate for price changes. To analyze this aspect we focus on the real exchange rate deviations of the participating currencies. The real exchange rate is defined as

$$\theta_{i,t}^{ACU} = \varepsilon_{i,t}^{ACU} \frac{P_t^{ACU}}{P_t^i} \qquad (4)$$

where $\theta_{i,t}^{ACU}$ is the real exchange rate, $P_t^{ACU}$ is the weighted average price level for the region, $P_t^i$ is the price in country i. Thus, following Ogawa and Shimuzu (2007), the extent of real exchange rate deviation is calculated by looking at the difference between nominal exchange rate deviation and the inflation differential between the region and the individual country. Inflation is constructed using the consumer price index (CPI). To obtain the inflation for the ACU region we construct a weighted average of the CPI for the region using weights based on GDP measured in purchasing power parity, intraregional trade and intraregional investment. Since CPI data are available at a monthly frequency the real exchange rate deviation indicators are constructed at a monthly frequency.[2]

**Figure 3: Real Deviation of the Participating Currencies vis-à-vis the Asian Currency Unit**



BND=Brunei dollar; KHR=riel; CNY=yuan; HKD=Hong Kong dollar; INR=Indian rupee; IDR=rupiah; JPY=yen; KRW=won; LAK=kip; MYR=ringgit; MMK=kyat; PHP=Philippine peso; SGD=Singapore dollar; THB=baht; VND=dong.

Source: Author's calculations.

In the case of real exchange rate deviation, domestic inflation rates higher than the weighted average for the region adds to the appreciation pressure while lower inflation results in depreciation pressure. Figure 3 shows that the extent of real exchange rate deviations, which take into account inflation differentials, are considerably different from the nominal exchange

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[2] Data on Consumer Price Index are obtained from the Global Economic Monitor and websites of the central banks and monetary authorities of the participating countries. Owing to a large difference between the weighted inflation rate for the region as a whole and Myanmar, Myanmar is removed from the sample.

rate deviations. The yen, which had appreciated strongly in nominal terms, shows a sustained depreciating trend in real terms due to extremely low and sometimes negative inflation rates prevailing in the Japanese economy during this period. The large weight accorded to Japan in the creation of the regional price index has meant that a number of countries have witnessed inflation rates that are considerably higher than the regional average. The rupiah, the Philippine peso, and the Indian rupee, which experienced sharp depreciation in nominal terms, exhibited an appreciating trend in real terms due to relatively higher inflation. In the case of the baht, the appreciation trend gets accentuated when inflation differentials are taken into account. In contrast, due to Hong Kong, China experiencing inflation levels lower than the regional average, the depreciating trend of the Hong Kong dollar has increased in real terms.

Next, the paper focuses on whether the extent of the deviation among the participating currencies has increased or declined over time. We look at the movement in the weighted averages of the nominal and real exchange rate deviation during the period. As described in Equation (5) the weighted average is equal to the weighted sum of absolute deviation of the participating currencies or

$$WD_{i,t} = \sum_i w_i \left| D_{i,t} \right| \tag{5}$$

where $\left| D_{i,t} \right|$ is the absolute percentage real or nominal deviation for currency i at time t. and $w_i$ is the relative weight on currency I, which is the average of weights based on trade, investment, and GDP measured in purchasing power parity

## Figure 4: Weighted Average Deviation
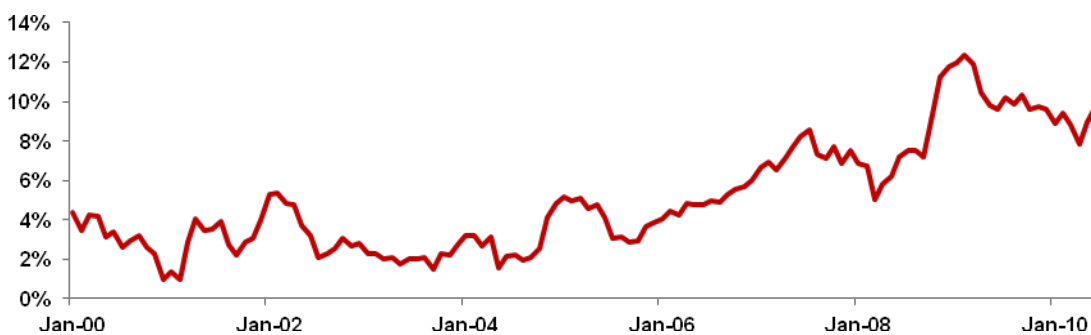


a. Nominal Exchange Rates
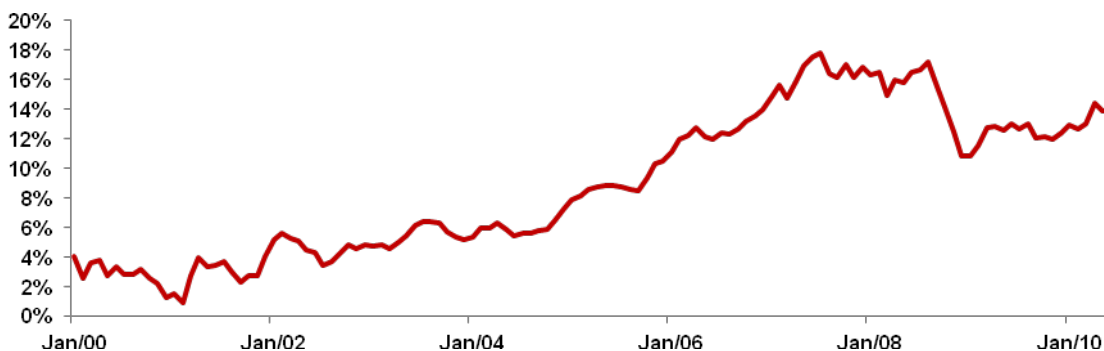


b. Real Exchange Rates

Source: Author's calculations.

Figure 4a indicates that the deviation among the nominal exchange rates was relatively stable between 2000 and 2004. However, since early 2004 there was a sharp increase in the extent of deviation, which peaked prior to the onset global financial crisis. Between late 2008 and end 2009 a number of countries were impacted in a symmetrical manner by global events. The initial flight to safety of foreign capital in the second half of 2008 led to the weakening of many Asian currencies, especially against the US dollar. With signs of recovery since mid-2009, these economies started witnessing an inflow of capital, which allowed many Asian currencies to appreciate. The extent of the deviation among these currencies again started increasing since 2010. In the case of real exchange rates also there was a persistent trend of widening deviation between 2001 and the global financial crisis (Figure 4b). The subsequent dip in the extent of real exchange rate deviation was largely due to drop in nominal exchange rate deviation and reduction inflation differential. The strengthening of commodity prices prior to the collapse of Lehman Brothers, and the subsequent dip in commodity prices, had an analogous impact in most of the economies. Much of the movement in the weighted average deviations has been driven by the yen and the won. In recent years there has been increasing contribution from the Hong Kong dollar and the Indian rupee due to these currencies experiencing greater volatility than before.

A common approach to examine convergence of a series is to apply the unit root test to examine whether the difference is stationary. The rejection of the unit root hypothesis implies that the time series is stationary and will converge in the long run. However, if these tests fail to reject the hypothesis then the series follows a random path.

To evaluate the extent of nominal and real convergence among participating currencies we employ both the Augmented Dickey Fuller and the Phillips–Perron test. However, as pointed out by Fan and Wei (2006) a constraint of these tests is that they have low power in the sense that they tend to reject overly the stationarity hypothesis of a time series. To account for this shortcoming we also focus on panel unit root tests.

The benchmark test of exchange rate convergence is based on the stochastic model given by Equation (6) below:

$$D_{i,t} = \alpha_i + \rho D_{i,t-1} + \mu_{i,t} \tag{6}$$

where i is country index, $\alpha_i$ is the idiosyncratic factor in country i and $\mu_{i,t}$ is a white noise error term. This can be reformulated as Equation (7)

$$\Delta D_{i,t} = \alpha_i + \psi_i D_{i,t-1} + \sum_{j=1}^{\rho_i} \xi_j \Delta D_{i,t-j} + \mu_{i,t} \tag{7}$$

Here $\psi_i > 0$ implies an explosive process, $\psi_i = 0$ describes random walk behavior, and $\psi_i < 0$ implies stationary process and convergence. To test the stationarity, we employ two methodologies developed by Levin, Lin, and Chu (2002) and Im, Pesaran, and Shin (2003). The methodologies in both these tests have been developed from a multivariate generalization of the ADF test. A limitation of the Levin–Lin–Chu test is that it imposes a cross-equation restriction on the first order autocorrelation coefficients. In contrast, Im–Pesaran–Shin test allows the autocorrelation coefficients to differ across panel members. Moreover, the Levin–Lin–Chu test requires the panels to be strongly balanced, while the Im–Pesaran–Shin test works with unbalanced panel. To ensure that the panel is balanced we restrict our dataset on nominal deviation between January 2001 and September 2011 and for real deviation between January 2001 and December 2010.

Table 2 focuses on the extent of nominal exchange rate convergence. The null hypothesis that the averaged weighted deviation has unit root over the entire sample from 2000 to 2011 cannot be rejected. Next, the sample is split on a yearly basis and it is observed that in 2001 and 2002 there was some evidence of exchange rate convergence, but in the subsequent years there is no such evidence. The panel unit root tests also provide similar conclusions.

**Table 2: Convergence among Participating Currencies in Nominal Terms**

|  | Averaged Weighted Deviation | | Panel Unit Root Test | |
|  | Augmented Dickey–Fuller | Phillips–Perron | Im–Pesaran–Shin | Levin–Lin–Chu |
| --- | --- | --- | --- | --- |
| 2000–2011 | -0.328 | -0.342 | 1.616 | 2.767 |
|  | (0.92) | (0.92) | (0.95) | (0.99) |
| 2000 | -1.44 | -1.916 | 1.794 | 1.205 |
|  | (0.56) | (0.32) | (0.96) | (0.88) |
| 2001 | -1.360** | -1.344* | -0.756** | 0.480** |
|  | (0.04) | (0.06) | (0.03) | (0.02) |
| 2002 | -1.218* | -1.177* | -0.859* | -0.797** |
|  | (0.07) | (0.08) | (0.08) | (0.02) |
| 2003 | -2.37 | -2.733** | 3.013 | 1.995 |
|  | (0.15) | (0.05) | (0.99) | (0.97) |
| 2004 | -0.604 | -0.493 | 2.589 | 3.152 |
|  | (0.87) | (0.89) | (0.99) | (1.00) |
| 2005 | -1.555 | -1.794 | 0.827 | -0.359 |
|  | (0.51) | (0.38) | (0.79) | (0.36) |
| 2006 | -1.007 | -0.682 | -1.332** | -1.759*** |
|  | (0.75) | (0.85) | (0.04) | (0.01) |
| 2007 | -2.148 | -2.226 | 1.926 | 1.222 |
|  | (0.22) | (0.19) | (0.97) | (0.89) |
| 2008 | -0.486 | -0.514 | 1.985 | 141 |
|  | (0.89) | (0.89) | (0.97) | (0.56) |
| 2009 | -1.651 | -1.577 | 0.225 | 0.887 |
|  | (0.45) | (0.49) | (0.59) | (0.81) |
| 2010 | -1.235 | -1.177 | -0.115 | -0.609 |
|  | (0.66) | (0.68) | (0.45) | (0.27) |
| 2011 | -0.059 | -0.033 | 0.229 | 0.42 |
|  | (0.95) | (0.96) | (0.59) | (0.66) |

P-values in brackets. ***, **, and * imply significance at 1%, 5% and 10% respectively.

Source: Author's calculations.

Table 3 looks at the extent of real exchange rate convergence. Since real exchange rate deviation is available only on a monthly basis, to ensure adequate degrees of freedom, the data is split by including data for two years at a time. A similar result is obtained where for the entire period as well as the sub samples, there is little evidence of convergence. Some evidence of convergence is observed during 2008–2010. As discussed above, this might be due to the simultaneous weakening of most currencies during the global financial crisis, and their subsequent revival once capital flows resumed. Moreover, the rise in commodity prices prior to the crisis and their subsequent slump could also have affected these economies in a coordinated manner.

**Table 3: Convergence among Participating Currencies in Real Terms**

| | Averaged Weighted Deviation | | Panel Unit Root Test | |
|---|---|---|---|---|
| | Augmented Dickey–Fuller | Phillips–Perron | Im–Pesaran–Shin | Levin–Lin–Chu |
| 2000–2011 | -1.177 | -0.888 | 0.603 | -0.148 |
| | (0.68) | (0.79) | (0.73) | (0.44) |
| 2000–2001 | -1.81 | -1.916 | -1.734** | -1.547* |
| | (0.37) | (0.32) | (0.04) | (0.09) |
| 2002–2003 | -1.857 | -1.273 | -1.563 | -2.891 |
| | (0.35) | (0.64) | (0.15) | (0.19) |
| 2004–2005 | -0.227 | -0.191 | 2.687 | 0.681 |
| | (0.93) | (0.94) | (0.99) | (0.75) |
| 2006–2007 | 0.138 | 0.084 | 2.581 | 0.803 |
| | (0.97) | (0.97) | (0.99) | (0.79) |
| 2008–2010 | -2.453* | -2.787* | -1.009** | -3.089*** |
| | (0.10) | (0.06) | (0.05) | 0.00 |

P-values in brackets. ***, **, and * imply significance at 1%, 5% and 10% respectively.

Source: Author's calculations.

# 3. EXCHANGE RATE REGIME DIVERSITY

The diverse movement in participating countries' currencies is explained primarily by the different exchange rate regimes followed by these countries. This divergence in exchange rate regimes signals the difference in the priorities of the monetary and exchange rate policy. In a number of Asian economies the exchange rate serves as the nominal anchor or intermediate target of monetary policy. In these countries, the monetary authority intervenes in the foreign exchange market to maintain the exchange rate at its predetermined level or within a range. In these countries, the domestic currency can be tied to a major global currency like the US dollar, a basket of currencies, or some regional currency.[3]

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[3] The Brunei dollar is tied to the Singapore dollar in a 1:1 ratio.

**Table 4: Classification of Exchange Rates Regimes and Monetary Framework**

| | | Exchange Rate Arrangements | | | | |
|---|---|---|---|---|---|---|
| | | Currency Board | Other Conventional Fixed Peg Arrangement | Crawling Peg | Managed Float with no Predetermined Path | Independently Floating |
| **Monetary Policy Framework** | Exchange Rate Anchor US Dollar | Hong Kong, China | Viet Nam | People's Republic of China | Cambodia, Lao PDR, and Myanmar | |
| | Composite | | | | Singapore | |
| | Others | Brunei Darussalam | | | | |
| | Monetary Target | | | | | |
| | Inflation Targeting | | | | Indonesia and Thailand | Korea and Philippines |
| | Others | | | | India and Malaysia | Japan |

Source: IMF's De Facto Classification of Exchange Rate Regimes and Monetary Framework (2009).

Many of the developed and some of the emerging economies of the region have resorted to inflation targeting. This requires a greater degree of exchange rate flexibility as monetary policy decisions are guided by the deviation of forecasts of future inflation from the announced inflation target. Finally, some countries do not resort to a single explicit nominal anchor but monitor various indicators in conducting monetary policy. Table 4 lists the exchange rate regimes practiced by the participating countries according to the IMF's de facto classification of exchange rates regimes and monetary framework.

Since 2000, a small amount of literature on data-driven methods for the classification of exchange rate regimes has developed (Reinhart and Rogoff 2004; Levy-Yeyati and Sturzenegger 2005). This literature has classified exchange rate regimes in operation using a variety of alternative algorithms. Such a classification helps in analyzing the evolution of a country's exchange rate regime over a period. Figure 5 highlights the evolution of exchange regimes in the participating countries during 2000 to 2007 according to the Reinhart and Rogoff (2004) classification. Apart from the fact that exchange rate regimes in these participating countries continue to be quite diverse, except for India, Lao PDR, and Malaysia, all other countries have witnessed virtually no change in their exchange rate regimes.

These databases, though quite useful for many analyses, have limited success in measuring the finer structure of intermediate regimes. As an example, the Reinhart and Rogoff classification does not identify a break in the PRC's exchange rate regime after July 2005, when it announced a move towards pegging of the yuan to a currency basket.

## Figure 5: De Facto Exchange Rate Regimes
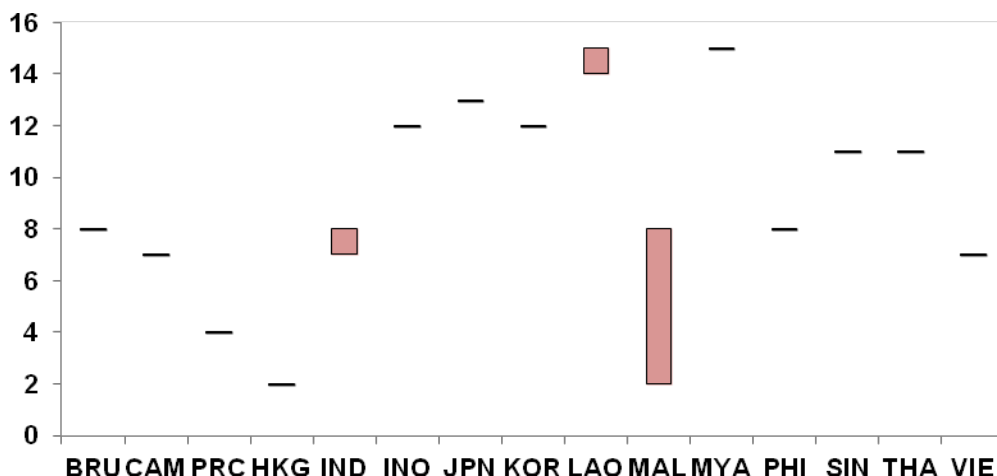


Notes:

| | | |
|---|---|---|
| 1. No separate legal tender | 2. Currency board arrangement | 3. Pre announced horizontal band = ±2% |
| 4. De facto peg | 5. Pre announced crawling peg | 6. Pre announced crawling band = ±2% |
| 7. De facto or crawling peg | 8. De facto crawling band | 9. Pre announced crawling band = ±2% |
| 10. De facto crawling band = ±5% | 11. Moving band = ±2% | 12. Managed floating |
| 13. Freely floating | 14. Freely falling | 15. Dual market in which parallel market data is missing |

BRU=Brunei Darussalam; CAM=Cambodia; PRC=People's Republic of China; HKG=Hong Kong, China; IND=India; INO=Indonesia; JPN=Japan; KOR=Korea, LAO=Lao PDR; MAL=Malaysia; MYA=Myanmar; PHI=Philippines; SIN=Singapore; THA=Thailand; VIE=Viet Nam.

Source: Reinhart and Rogoff (2004).

Given the wide dispersion among the exchange rate regimes prevailing in various Asian economies, an empirical analysis is conducted to investigate the extent their linkage with the three major global currencies: the US dollar, the euro, and the yen. The methodology outlined by Frankel and Wei (1994) is used to analyze these linkages. Frankel and Wei assume the Swiss franc as a numèraire in the denomination of exchange rates. Daily data of exchange rates are used to conduct regression of log differences of the local currency (in terms of the Swiss franc) on log differences of the three major currencies (in terms of the Swiss franc).

The regression equation is as follows

$$\Delta \log \varepsilon_{i,t}^{CHF} = \alpha_0 + \beta_1 \Delta \log \varepsilon_{USD,t}^{CHF} + \beta_2 \Delta \log \varepsilon_{EUR,t}^{CHF} + \beta_3 \Delta \log \varepsilon_{JPY,t}^{CHF} + \mu_{i,t}$$

(8)

where $\varepsilon_{i,t}^{CHF}$ is the value of currency i vis-à-vis the Swiss franc and $\varepsilon_{USD,t}^{CHF}$, $\varepsilon_{EUR,t}^{CHF}$ and $\varepsilon_{JPY,t}^{CHF}$ are the values of the dollar, euro, and yen in terms of the Swiss franc. The coefficients are considered to represent the weights of the respective currencies. We look at the recursive least squares estimate from January 2001 to September 2011. The recursive estimates are generated by running the above regression iteratively using a moving window of data by

dropping old observations as new ones are added. Figure 6 plots the coefficients of the recursive estimates.

While most Asian currencies showed a high degree of linkage with the US dollar, the won, rupiah, and the Philippine peso indicate the importance of other factors in their currency regime. The won's linkage with the dollar exhibited a decreasing trend between 2001 and 2005 when it dropped to below 0.6 compared to 1.05 in 2001. Subsequently, there was an increase in the linkage with the dollar, which again reversed after the onset of the global financial crisis. The linkage with the yen hovered around 0.2 during 2001 to 2006 but has significantly declined since then, turning negative since mid- 2007. Since 2007, there has been an increase in the linkage with the euro, although the linkage was not significant for all the periods.

The extent of linkage of the rupiah and the baht with the dollar dropped from being over unity and around 0.8 respectively in 2001 to below 0.6 in 2007, after which there was some increase in the extent of linkage. While the rupiah's linkage with the euro increased sharply between 2006 and 2008 it stayed below 0.2 in case of the baht. In both cases the relationship exhibited considerable volatility and was not always statistically significant. Moreover, in the case of the rupiah the extent of the linkage also dropped considerably since the global financial crisis, while the baht remained relatively steady. In case of both the baht and the rupiah, the coefficient on the yen increased between 2001 and 2005 but declined thereafter to be close to zero

The Brunei dollar is linked with the Singapore dollar in a currency board arrangement and hence both these currencies exhibit similar movements against the major currencies. The Monetary Authority of Singapore targets a basket of currencies giving relatively higher weight to the US dollar. However, there has been a decline in the weight accorded to the US dollar between 2001 and 2006, after which there has been a moderate increase. On the other hand there has been a sharp increase in the linkage with the euro, which has been offset by a decline in its linkage with the yen.
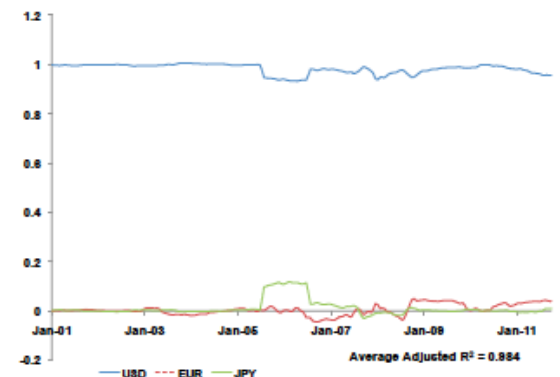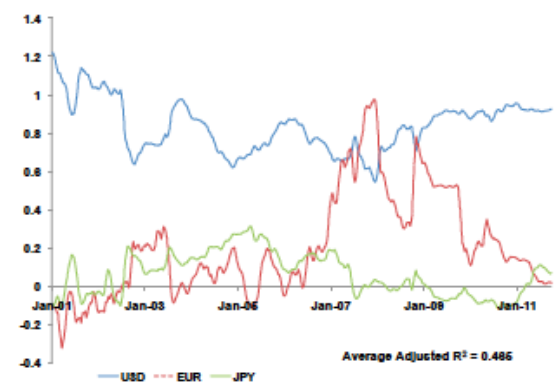
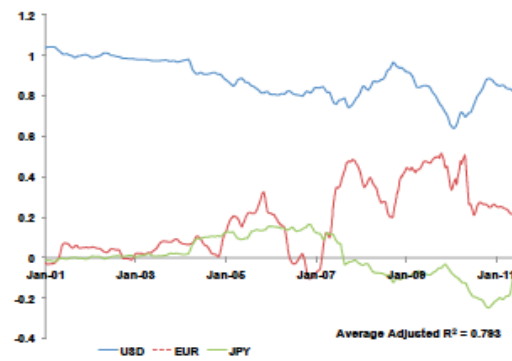**Figure 6: Recursive Least Square Estimates for Participating Currencies**
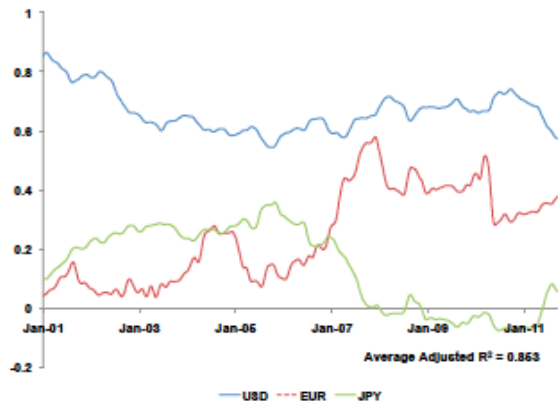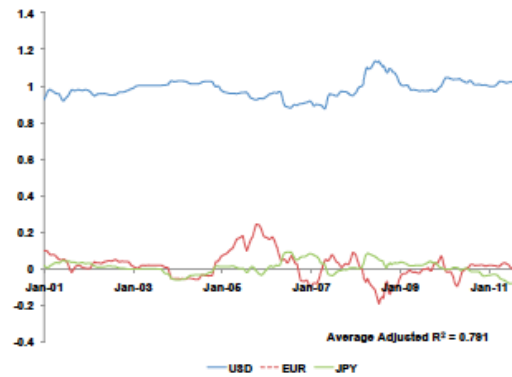


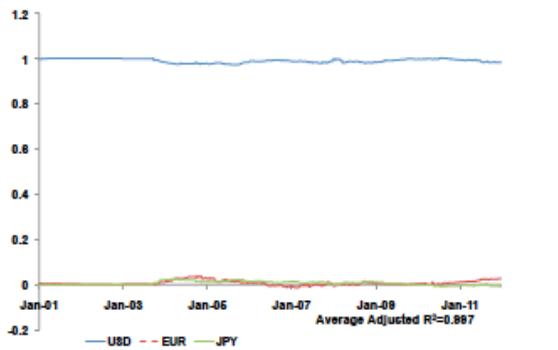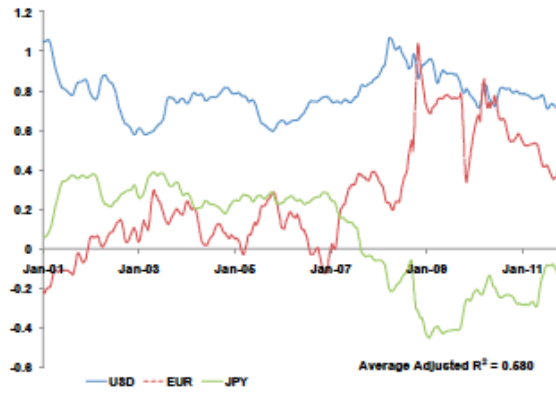Brunei Dollar　　　　　　　　　　　Cambodian Riel　　　　　　　　　　　PRC Yuan

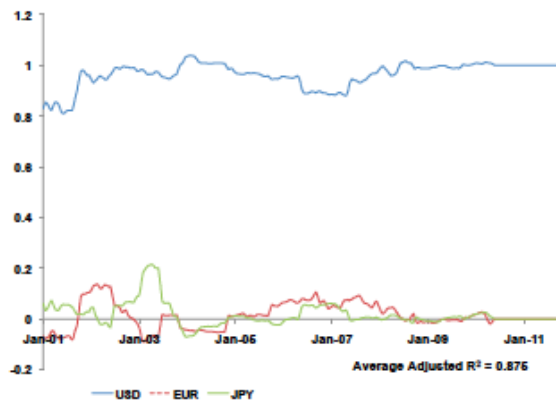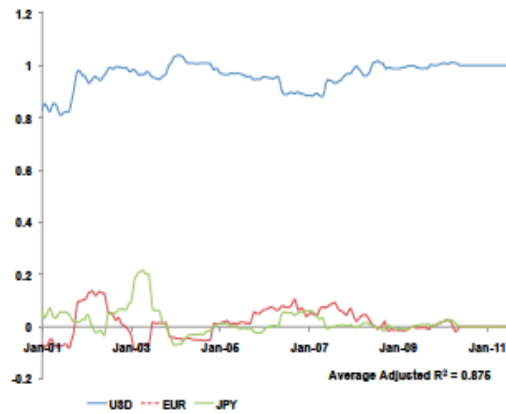## Hong Kong Dollar

## Indian Rupee
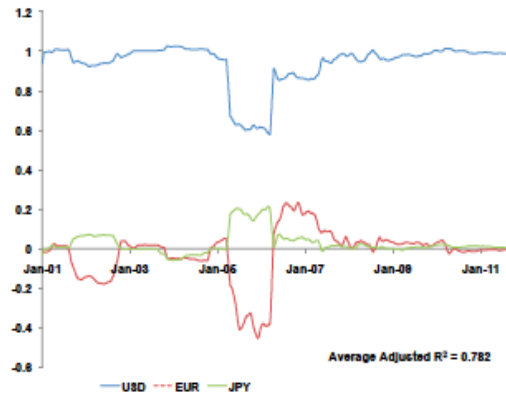
## Indonesian Rupiah
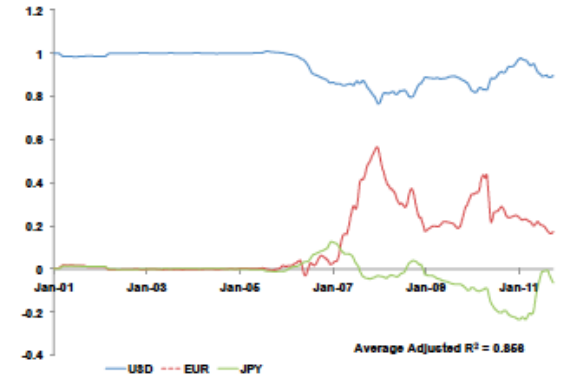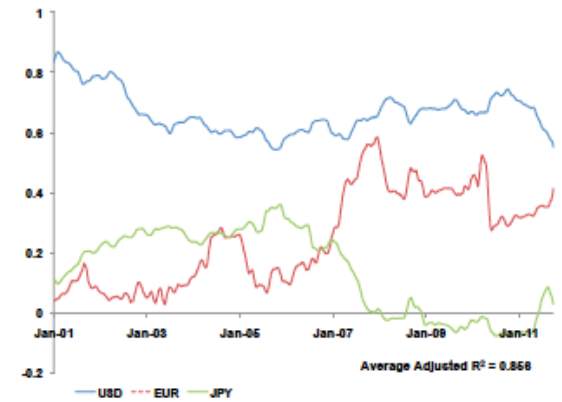
## Korean Won

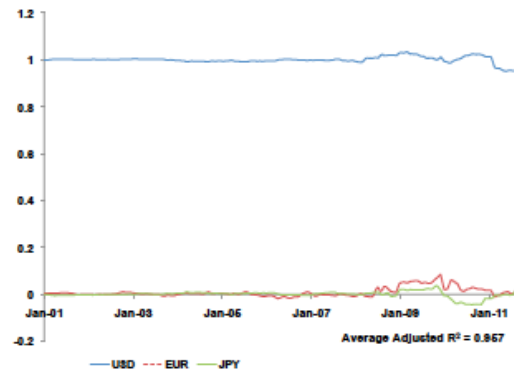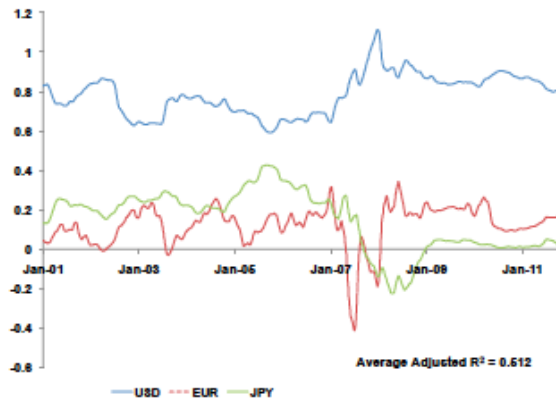## Lao PDR Kip

## Malaysian Ringgit

## Myanmar Kyat

## Philippine Peso

## Singapore Dollar

Thai Baht                                    Viet Nam Dong

Notes: PRC = People's Republic of China; Lao PDR = Lao People's Democratic Republic.

Source: Author's calculations.

The yuan was perfectly linked to the US dollar from 2001 to the middle of 2005 with the coefficient on the dollar being 1.00 prior to 2005. After the PRC government announced in July 2005 to move from a dollar peg to a currency basket peg, there was a marginal decline in the linkage with the dollar and an increase in the linkage with yen. However, this was a short-term phenomenon as soon the linkage with the dollar increased to be in excess of 0.98. Through most of the period the linkage of the yuan with the euro has been statistically insignificant. In contrast, the ringgit, which was delinked from the US dollar in July 2005, has shown a substantial reduction in linkage with the dollar. The linkage dropped below 0.8 towards end 2007, although after the global financial crisis there was an increase in the linkage till 2010. On the other hand, linkage with the euro significantly increased in 2007 and has continued to be relatively high since then. Thus Malaysia seems to have made the successful transition from a US dollar peg to a currency basket peg. While the average adjusted $R^2$ for the yuan was in excess of 0.98, in the case of the ringgit it was around 0.88.

The Philippine peso continued to exhibit a strong linkage with the US dollar, with the linkage varying between 0.73 and 1.01 between 2001 and 2005. This was higher than most other Asian economies. There was an increase in its linkage with the euro in 2007 but this declined sharply during the subsequent months. Moreover, the linkage was not always statistically significant. The Philippine peso also exhibited intermittent increase in linkage with the yen. The linkage between the Indian rupee and the dollar exhibited a downtrend between 2001 and 2007. However, there was an increase in the degree of linkage prior to the collapse of Lehman Brothers and again through most of 2010. After 2007, there was an increase in the linkage with the euro, but the there was a great deal of volatility in the extent of relationship, and it was not statistically significant across all periods. The extent of linkage between the Indian rupee and the yen has been relatively low and insignificant through most of the period.

Among the other ASEAN members, the kip, the riel, the kyat, and the dong have been largely fixed to the dollar during 2001 to 2011. Almost across the entire period, the euro and the yen exerted an insignificant impact on the currencies of these countries.

# 4. INSTITUTIONAL ARRANGEMENTS TO FACILITATE EXCHANGE RATE COORDINATION

## 4.1 Enhanced Trade Integration

Intricate production networks and supply chains have fostered regional integration. Intraregional trade has increased from 20% in 1950s to well over 50% in 2008. Most of this trade is concentrated in intermediate products, with about 58% of Asia's trade in parts and components being sourced from within the region. Much of this integration is focused in East Asia, with South Asia and Central Asia accounting for a small part of such trade, although South Asia's manufacturing trade has been increasing rapidly (ADB 2010).

The rise in intraregional trade has been associated with a proliferation of regional free trade agreements (FTAs). Some of these FTAs have been driven by a desire to liberalize sectors that were earlier ignored at the multilateral negotiations and are described as "WTO-plus," while others have resulted in restoration or creation of newer markets.[4] Table 5 highlights the number of FTAs the participating countries have engaged in. While these FTAs have a significant potential in creating trade, there is also a potential cost associated with them. The creation of a web of overlapping FTAs can lead to the "spaghetti-bowl" effect, under which the

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[4] WTO-plus refers to obligations exceeding the existing requirements of the World Trade Organization agreements.

inconsistencies between agreements (such as conflicting standards, different exclusion standards, and varying tariff phase out schedules) increase the cost of doing business and welfare losses associated with trade diversion. Some of these costs can be mitigated and the benefits enhanced by increasing the width and depth of the FTAs (Kawai and Wignaraja 2009).

The rising amount of trade integration provides an opportunity to promote the use of the ACU by denominating regional crossborder trade in the ACU. This would lead to a lowering of transaction costs as well as providing a defense against sharp exchange rate volatility. With trade being denominated in the ACU, the central banks can be persuaded to hold a fraction of their reserves in the ACU. Such a move will help in alleviating global imbalances.

**Table 5: Trade Agreements of Participating Currencies**

| COUNTRY | Proposed | Framework Agreement Signed/Under Negotiation | Concluded | | Total | Within Region | Outside Region |
|---|---|---|---|---|---|---|---|
| | | | Signed but not In Effect | Signed and In Effect | | | |
| Brunei Darussalam | 4 | 3 | 0 | 8 | 15 | 9 | 6 |
| Cambodia | 2 | 1 | 0 | 6 | 9 | 8 | 1 |
| PRC | 6 | 6 | 0 | 12 | 24 | 11 | 13 |
| India | 8 | 12 | 0 | 13 | 33 | 13 | 20 |
| Indonesia | 6 | 5 | 1 | 7 | 19 | 12 | 7 |
| Japan | 6 | 2 | 1 | 12 | 21 | 15 | 6 |
| Republic of Korea | 14 | 7 | 1 | 8 | 30 | 14 | 16 |
| Lao PDR | 2 | 1 | 0 | 8 | 11 | 10 | 1 |
| Malaysia | 6 | 6 | 2 | 10 | 24 | 13 | 11 |
| Singapore | 4 | 10 | 3 | 18 | 35 | 15 | 20 |
| Thailand | 6 | 7 | 0 | 11 | 24 | 16 | 8 |
| Viet Nam | 5 | 3 | 0 | 7 | 15 | 10 | 5 |

Lao PDR = Lao People's Democratic Republic;  PRC = People's Republic of China.

Source: Asia Regional Integration Centre Database. http://aric.adb.org/FTAbyCountryAll.php (accessed 15 January 2012).

## 4.2  The Chiang Mai Initiative

To ensure greater exchange rate cooperation, it is important to have a mechanism that will collectively defend participating currencies when they come under a speculative attack. The Chiang Mai Initiative (CMI) was created primarily to address this concern. The CMI is made up of two components. The ASEAN Swap Arrangement (ASA) came into being in 1977 with the ASEAN 5 countries establishing a reciprocal currency or swap arrangements.[5] The primary objective of this mechanism was to provide liquidity support against balance of payments difficulties. When the CMI was announced at the ASEAN+3 Finance Ministers' Meeting in 2000, the ASA was expanded to all current ASEAN members, although the swaps with the PRC, Japan, and Korea (the +3 countries) were restricted to the original five members.

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[5] The countries involved under the ASEAN Swap Arrangement were Indonesia, Malaysia, Philippines, Singapore, and Thailand.

The 2008–2009 global financial crisis renewed the calls for greater Asian financial cooperation. The need for a greater amount of resource pooling and the need to transform the system of bilateral swaps into a regional pooling arrangement of collectively managed reserves was realized. Consequently, in 2010 the existing institutional mechanism was transformed into the CMI multilateralization (CMIM). The CMIM involved a new approach to contributions by participating countries to the common pool, a new decision-making mechanism to govern the fund, and the conduct of a new regional process. In the CMIM, the "+3" countries volunteered to provide 80% of the funds. As shown in Figure 7, Japan and the PRC agreed to contribute $38.4 billion (32%) each, with the PRC's share including $4.2 billion from Hong Kong, China. Korea is the next largest donor with $19.2 billion (16%). The East Asian economies of Indonesia, Singapore, Thailand, Malaysia, and the Philippines each agreed to provide $4.55 billion (3.79%). The CMIM has an intrinsic bias in favor of the smaller countries with the PRC and Japan being able to borrow only up to 50% of their contribution from the fund and Korea being able to borrow an amount equivalent to its contribution. The larger ASEAN members can borrow up to 2.5 times their contribution while the smaller economies can borrow up to 5 times.

**Figure 7: Contribution and Borrowing Arrangements under the Chiang Mai Initiative Multilateralization**
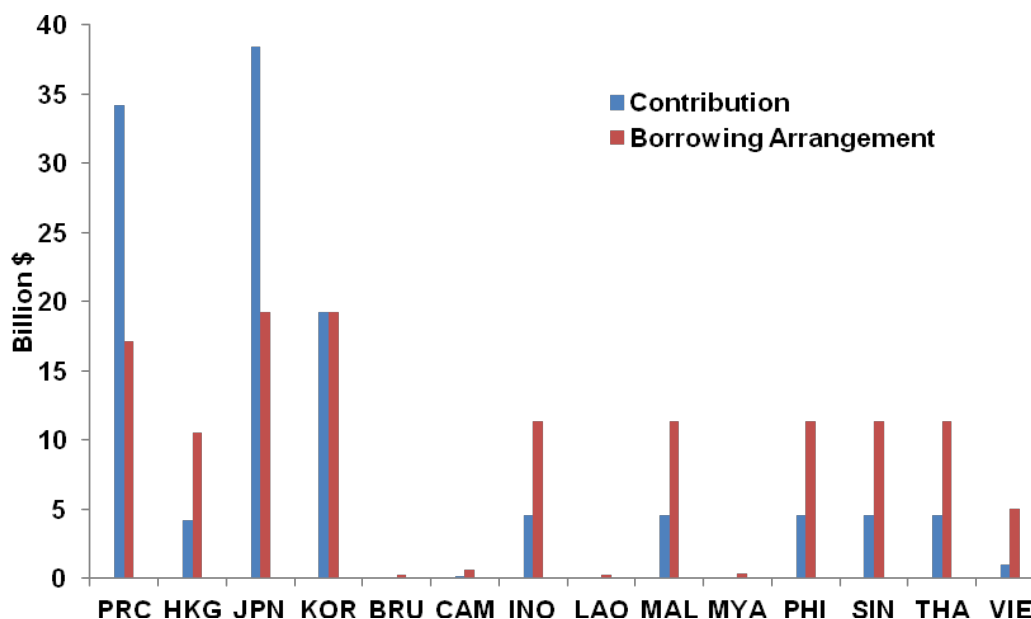


Notes: BRU=Brunei Darussalam; CAM=Cambodia; PRC=People's Republic of China; HKG=Hong Kong, China; INO=Indonesia; JPN=Japan; KOR=Korea, LAO=Lao PDR; MAL=Malaysia; MYA=Myanmar; PHI=Philippines; SIN=Singapore; THA=Thailand; VIE=Viet Nam.

Source: Capannelli (2011).

However, despite the recent reforms of the CMIM, there are continuing concerns. The first is to do with the amount of funds available. While the amount has been increased to $120 billion from around $84 billion at the end of 2010, it might still be inadequate to meet the liquidity needs of the Asian economy. Capannelli (2011) argues that during the global financial crisis the Asian economies required about $40 billion to $60 billion in liquidity support, while under the CMIM they are eligible for less than $12 billion. Moreover, countries like Korea and Singapore, which had access to CMIM funds opted for bilateral support lines from the US Federal Reserve, instead of activating the CMIM. Many countries also find the close link of the CMIM with the programs of the IMF contentious. Under the current financing agreement, mobilization of more than 20% of an individual country's quota has to be reviewed by the IMF, which can apply

conditionality rules linked to the program. There has been demand to increase the amount of money the participating countries can access without being subject to IMF conditionality.

If the CMIM is to prove itself as a viable alternative there is a need to expand both in terms of resources available as well as the number of participating countries. The resource pool could be enlarged by greater commitment of resources from the existing members as well as inviting new members. The CMIM could also help in promoting the use of the ACU by denominating a certain fraction of the contributions as well as borrowing arrangements in the ACU.

## 4.3 ASEAN+3 Macroeconomic Research Office

Another critical requirement for countries attempting exchange rate coordination is the need for an effective regional surveillance mechanism. Such a mechanism should monitor the national policies of the participating countries and ensure that no country follows a policy that could destabilize the region. The original regional economic review and policy dialogue (ERPD) had several inadequacies as the final reports that were brought out under it were largely inoffensive and did not underpin countries following regionally destabilizing policies. The newly instituted ASEAN+3 Macroeconomic Research Office (AMRO) is expected to address some of these inadequacies. The AMRO will serve as the independent regional surveillance unit of the CMIM. It will ensure timely monitoring and analysis of the participating countries that will help in early detection of risks and swift implementation of remedial actions. During the recent global economic crisis, one of the reasons why the CMI swaps could not be used was the absence of a surveillance unit to conduct due diligence. In the absence of such a mechanism, the countries in the region were not willing to lend to each other as a result of which Korea and Singapore had to rely on national reserves or trigger their swap agreements with nonregional and regional countries outside the CMI.

During normal times the AMRO is expected to regularly consult with the member countries and prepare reports on the macroeconomic assessment of the ASEAN+3region and individual member countries. However, during episodes of crisis, the AMRO is expected to prepare recommendations on any swap request based on its macroeconomic analysis of the requesting member. As pointed out by Kenen and Meade (2008) and Girardin (2003) a noticeable characteristic of Asian economies is the pursuit of a policy of not intervening in affairs of other countries. This needs to change as with increased integration and enhanced exchange rate coordination shocks can quickly transmit from the originating country to the region. Kenen and Meade (2008) and Grenville (2004) suggest a mechanism whereby an independent surveillance team would review the performance of an economy and submit a report, and the member country government would be able to respond to the submission. A healthy debate on major macroeconomic and financial sector issues impacting the reporting country is needed for better surveillance and greater coordination.

## 4.4 Development of Bond Markets

As stated above, a key factor that has been identified as a driver of the recent financial crisis is the extent of global imbalances, that is, the pattern of large, persistent current-account deficits in the US and, to a lesser extent, in the United Kingdom and some other developed economies, matched by surpluses in emerging markets, notably the PRC. It is widely perceived that the high savings rates and rapid growth in Asian economies led to a large demand for risk free assets. This resulted in a surge of capital flowing into the US, creating an asset bubble that eventually crashed and compromised the financial sector. The primary reason why Asian savings found

their way to the US was the inability of some Asian countries to create savings and investment vehicles to keep up with the rapid growth, due to immature financial markets.

The Asian Bond Market Initiative (ABMI) and the Asian Bond Fund (ABF) were established to help the development of bond markets and strengthen domestic financial sectors to enable the recycling of Asian savings into Asian investment. The ABMI was created in 2002 and became operational in 2003. It facilitates the establishment of credit guarantee mechanisms, propagates information on bond markets, creates new securitized debt instruments, strengthens domestic credit rating agencies, and assesses the feasibility of regional foreign exchange clearing and settlement mechanisms. In 2010, the ASEAN+3 finance ministers agreed to set up a Credit Guarantee and Investment Facility (CGIF), facilitating the development of capital markets. The CGIF is expected to provide credit guarantees to local corporations to allow them to raise long-term funds by improving the conditions to issue bonds.

In the first phase, the Asian Bond Fund (ABF1) invested $1 billion in a basket of US dollar denominated bonds issued by sovereign and quasi-sovereign issuers in EMEAP member countries, with the exception of Australia, Japan, and New Zealand. However, the fact that it could invest only in bonds denominated in US dollars, meant that it was unable to resolve an insolvency crisis of an Asian bond issuer on occasions involving sharp declines in values of Asian currencies vis-à-vis the US dollar leading to the critical problem of "currency mismatch". By borrowing in dollars and investing in domestic projects like housing and irrigation, Asian countries were being asked to take risks similar to the kind they were taking prior to the 1997 crisis. Furthermore there were issues related to maturity mismatch. The majority of the bond issuers are private and use funds for long-term investments. However, foreign lenders mostly lend in the short term, creating the possibility of their withdrawing and reducing risk exposure under adverse business conditions.

Recognizing the need to develop a local currency denominated bond market and to address the maturity and currency mismatches, the second phase of the Asian Bond Fund (ABF2) was launched in 2004. The funds available with this initiative were doubled to $2 billion. ABF2 consists of a Pan-Asian Bond Index Fund (PAIF) and Fund of Bonds Fund (FoBF). The PAIF is a single-index bond fund with $1 billion and invests in sovereign and quasi-sovereign local currency-denominated bonds issued in the eight EMEAP markets. In contrast, the FoBF is a two-tier structure consisting of a parent fund, which in turn invests in eight country funds. These eight single market funds have a combined amount of $1 billion and each of these funds invest in sovereign and quasi-sovereign local currency-denominated bonds issued in the respective EMEAP market. The purpose of these country sub-funds is two fold. While they provide local investors with low-cost and index-driven investment vehicles, they also give regional and international investors the flexibility to invest in the Asian bond markets of their choice.

While these initiatives have helped the growth of the bond market and reduce currency and maturity mismatches there is still a need to strengthen regulatory frameworks, improve market infrastructure, and harmonize rules.

These initiatives and the objective of exchange rate coordination can mutually benefit through greater interaction. While the denomination of local bond issues under these initiatives in the ACU could foster greater exchange rate coordination, it would also significantly add to the lowering of transaction costs and exchange rate uncertainty. Banks can also provide loans and accept deposits in the regional benchmark.

## 4.5  Exchange Rate Coordination

As discussed above, the diversity in the exchange rate regimes of the participating currencies is one of the major reasons for lack of convergence among these currencies. To achieve increased exchange rate coordination, the historical inertia associated with the use of national currencies will have to be overcome. Moreover, countries in the region that have relied on monetary and exchange rate policies to stabilize their economies might be concerned about relinquishing these macroeconomic tools. Thus countries will have to undertake a gradual and calibrated approach towards exchange rate coordination. A policy dialogue needs to be initiated where the participating currencies discuss the implications of currency regimes and misalignment of individual currencies on the region as a whole. The ACU can be a useful indicator to provide information on the degree of flexibility of individual currencies and the degree of misalignment.

Subsequently countries could initiate greater coordination that would involve fostering greater flexibility vis-à-vis external currencies and improved stability within participating currencies. A number of alternatives have been put forward in the literature, but they all have associated costs. Oh and Harvie (2001) propose replicating the European Monetary System's Exchange Rate Mechanism (ERM) in the region. However, with the different characteristics of the Asian economies, an ERM should be adopted in Asia but with notable differences. An ACU similar to the one created in this study can be put in place, with participating members agreeing to float their currencies within a ±15% band of the central parity. This kind of an arrangement will lower inter-regional volatility of both nominal and real exchange rates resulting from intraregional parity changes and result in a greater degree of co-movement of intraregional exchange rates. However, since the target is a basket of member country currencies, realignments between currencies outside the basket are not reflected in bilateral exchange rates.[6]

In an alternate arrangement, Dornbusch and Park (1999) proposed the idea of monetary cooperation among Asian economies with the yen as the anchor currency, a role performed by the Deutsche mark under the ERM. However, given that the Japanese economy has not been very robust since the early 1990s, and the rising economic stature of other economies like the PRC, Korea, and India, it will be difficult to push this proposal. Moreover such an arrangement will entail a loss of competitiveness of Asian exports vis-à-vis other dollar blocs like the Common Southern Market (Mercosur) and the North American Free Trade Area (NAFTA) if the yen appreciates against the US dollar.

Williamson (2005) suggests that the rising intraregional trade relations and a fairly diversified extraregional trade pattern among participating countries make it reasonable to consider adopting a common basket numèraire.[7] Under this arrangement, countries could adopt weights based on their trade shares. On the choice of an individual currency basket and common basket, Williamson (2005) finds evidence of reduced instability of the participating countries'

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[6] For example, if the US dollar depreciates against the euro but not the Japanese yen then exports from countries pegged to the US dollar will become more competitive in the euro area compared to these Asian economies. Similarly, if the Japanese yen appreciates by 10% against the US dollar and Japan has 50% weight in the ACU, then other members of the ACU will witness a 5% appreciation, which may reduce their competitiveness vis-à-vis other dollar bloc countries.

[7] This arrangement argues for the initial exclusion of Japan as if it was included the Japan basket numèraire would exclude the yen. Given the sharp fluctuations of the yen this would imply that the other countries of the region face significant variations in their effective exchange rates even though they stabilized their rates in terms of the dollar-euro basket. Thus the arrangement calls for Japan to use as numèraire a dollar-euro basket with weights proportionate to their weights in the East Asian basket and when Japan is capable of limiting the fluctuations of the yen in terms of that basket to a reasonable magnitude, it would become a candidate for admission to the East Asian basket. It also argues the exclusion of India due to its trade pattern being significantly different from rest of the region.

effective exchange rates in the case of a common basket compared to an individual currency basket.

A major advantage of the basket numèraire is that it is consistent with a wide range of alternative exchange rate systems. It could be used across a diverse set of exchange rate regimes ranging from a narrow-margins peg (the PRC), to a greater commitment to an unchanged rate (Hong Kong, China), to an intermediate regime involving wide margins and the possibility of small changes in the central rate (Singapore), and to a managed float, provided that the country is willing to have its intervention disciplined by its (basket) central rate. The adoption of a common basket will also minimize the threat of losing competitiveness due to changes in exchange rates of third parties. This arrangement could also allow a wide band to provide ample flexibility. Finally, the central rate could also be changed in response to balance of payments disequilibrium or other macroeconomic shocks. However, each individual change in the central rate should be small.

The ACU should continue to serve as an important indicator to monitor the divergence of the participating currencies against a regional benchmark as well as joint movement of these movements against target currencies. With countries gaining greater intraregional stability and enhanced flexibility against the extraregional currencies, further exchange rate and monetary coordination can be possible through the "parallel currency" approach argued by Eichengreen (2006).

# 5. CONCLUSION

Monetary and exchange rate coordination is a long and arduous process. The large diversity among the countries in the region in terms of institutional capability and policy frameworks further obscures this process. While countries like Japan, Korea, Singapore, and Malaysia have fostered trade and financial linkages, the PRC, which has been the focal point of trade integration, has a long way to achieve financial integration. The loss of sovereignty over some aspects of economic policymaking, especially monetary policy, is another stumbling block toward enhanced exchange rate coordination.

A move toward greater monetary and exchange rate cooperation will also require the establishment of certain regional institutions that will promote economic and financial integration. Fortuitously, some of these building blocks are already in place in the region. These include a multilateralized swap arrangement, a regional surveillance mechanism, and a bond fund investing in local currency denominated bonds. However, as pointed out above, all these institutions have inherent drawbacks that need to be addressed before they can provide the foundation of greater regional integration. While the CMIM and ABF needs to be augmented, both in terms of funds at their disposal as well as coverage of countries, the surveillance mechanism needs to be made more effective to ensure that regionally destabilizing policies are not being pursued by individual member countries.

The monitoring of an ACU and the deviation of the participating currencies from this regional benchmark can play an important role in the regional surveillance process. The ACU could also act as a benchmark to initiate policy dialogue on greater exchange rate coordination. The analytical exercise undertaken in this study shows that there has not been a convergence among the participating currencies since 2000. This has been driven by the adoption of various exchange rate regimes by the participating countries. While the smaller members along with the PRC have maintained a close peg with the dollar, other economies such as Singapore, Korea, and Indonesia have reduced the linkage with the dollar. It is important to reduce the divergence among the various exchange rate regimes to move towards a path of exchange rate

convergence. As pointed out in Kawai (2010), the most realistic option is the adoption of a managed float regime that will stabilize intraregional exchange rate stability and at the same time provide flexibility against external currencies.

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