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## Managing recent hot money inflows in Asia

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## **Managing Recent Hot Money Inflows in Asia**

**Robert N. McCauley**

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**ADB Institute Discussion Paper No. 99**

Robert N. McCauley is Chief Representative, Representative Office for Asia and the Pacific, Bank for International Settlements. The author thanks, Corrinne Ho, Kyungsoo Kim, Guonan Ma, Alisara Mahasandana, Ilhyock Shim, Philip Wooldridge and Jens Zukunft for discussion and Emir Emiray for research assistance.

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**Abstract**

This paper surveys the nature of capital inflows into Asia since the peak of the US dollar in the first quarter of 2002 and the policy responses to them. Portfolio equity flows have become more volatile and more responsive to global equity market developments. Inflows into local bond markets have become important, although they are often immeasurable, virtual investments through derivative instruments. In the market that shows the highest level of direct non-resident holdings, namely that of Indonesia, these seem quite sensitive to global equity volatility. The most important qualitative change over this period involved bank flows. In particular, foreign bank flows have returned to net inflows after five years of pay-down after the 1997-98 financial crisis. Carry trades, although difficult to measure, appear to have become important, with notable growth in transactions in which a long position in one regional currency is taken against a short position in another one. Carry trades also show great sensitivity to global equity volatility.

In the face of such increasingly volatile capital inflows, the authorities in the region have adopted both measures to encourage outflows and to discourage inflows. Outside of Korea, measures to encourage outflows have met with limited response owing to expectations of further strength in the domestic currency and, until recently, buoyant domestic equity markets. Some of the measures to discourage inflows have taken the form of making previous measures to discourage outflows more symmetric, while others have taken the form of reinstating much reduced or eliminated restrictions, while other have taken the form of new adaptations. These limits on capital inflows can be quite effective, but they set back the development of financial markets and clash with ambitions for internationalized currencies in the region.

**JEL Classification: F21, F31, F32, F36, G12**

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## I. INTRODUCTION

Capital inflows into Asia were more puzzling than problematic in the years leading up to the peak of the dollar in early 2002. Into 2002, private capital flows remained mixed, with equity inflows offset to some extent by a private repayment of debts to the international banking system. These private outflows vis-à-vis banks were joined by an official outflow in the form of a build-up of foreign exchange reserves that in retrospect looks modest. While the inflows took the form of a purchase of risky assets, the outflows amounted to a purchase of safe assets, especially the investment of official reserves in prime securities (McCauley, 2003). Rather than an international exchange of assets effecting a symmetric sharing of risks, Asia was operating in the international capital markets to systematically lay off equity risk. Coming on top of generally substantial current account surpluses, Asian economies were battering down the hatches, positioning their international accounts to weather storms.

The flows have shifted since 2002 and have come to pose an increasing challenge to policymakers. This study first provides an updated overview of the pattern of capital inflows into Asia. While portfolio equity flows remain strong, bond markets in the region have entered the radar screens of global investors. Bank flows have turned from outflows to inflows. And currencies feel the effects of positioning in carry trades, in which investments in high-yielding currencies are funded by borrowing in low-yielding currencies. The next section elaborates these differences in the patterns of capital flows.

The following sections then take up in turn portfolio equity flows, bond market flows, bank flows and carry trades. Where possible, the type of non-resident investor is given attention, with a view toward gauging the “heat” of the capital inflows. The final section considers policy responses. The inflow of capital has tended to sharpen policy dilemmas. While opening the capital account to outflows is a general theme, the response can prove sluggish amid expectations of strong performance of domestic assets and the domestic currency. One observes that controls on outflows have often been made more symmetric. In important cases, previous liberalizations have been reversed for a time and even new controls on inflows put in place. Given the challenges posed by capital inflows, the process of opening capital accounts in Asia is not monotonic but instead has a rhythm of two steps forward, one step back.

## II. DIFFERENCES IN THE PATTERNS OF CAPITAL FLOWS SINCE 2002

Prospects for the strong performance of Asian economies have led to an acceleration of equity inflows. At the same time, prospects for appreciation, or at least stability, of Asian currencies have led to debt flows, including flows into local currency bond markets, bank flows and carry trades.

### A. Accelerating Portfolio Flows

Portfolio inflows into the region have accelerated and become more volatile. When global markets have experienced sharp downturns and the price of equity options has soared, Asian markets have seen massive withdrawal of foreign capital.

The usual view is that developments in peripheral markets reflect developments in major markets and evidence from daily cross-border flows in six Asian economies bears out this view. The image is often used of liquidity spilling over from major markets to smaller ones. But the systematic withdrawal of funds from Asia requires a new image: Asian markets *provide* liquidity under stressed conditions to portfolios managed in the major markets.

## **B. Indirect Foreign Investment in Local Currency Bonds**

Three or four years ago it was possible to characterize local currency bond markets in the region as generally parochial affairs (Jiang and McCauley, 2004), but they have become globalized since then. Except in Indonesia, this globalization has not so much taken the form of direct non-resident purchases. Rather, leveraged accounts have become virtual investors through derivatives, and foreign banks within the markets have become important holders, whether to hedge the derivative positions offered to leveraged investors or to hedge forward sales of dollars by exporters.

## **C. Return of Bank Inflows**

The most evident turnaround in capital flows vis-à-vis Asia since the dollar's peak in early 2002 has been the return of bank inflows. Given the history of the Asian financial crisis, the risk is that these flows are taken as a matter of reflex as hot money. That is, one is tempted to consider bank flows as having responded to interest-rate differentials favoring domestic currencies in the context of "excessive" or artificial stability of local currencies against the US dollar: in short, currency mismatches (Goldstein and Turner, 2005).

To a considerable extent, however, the return of bank flows reflects the experience of, or prospects of local currencies gaining against the US dollar. This is very different from the pre-crisis motivation to borrow dollars hoping for exchange rate stability. Where currencies have moved considerably, as in Korea and Thailand, exporters have sought to hedge future US dollar receipts by selling them against domestic currencies. This has drawn in short-term dollar funding, particularly into foreign bank branches, which is swapped for local currency. Thus the Asian banking systems tend to hold on their books a short-US dollar, long-domestic currency position that squares a forward commitment to buy dollars against local currency.

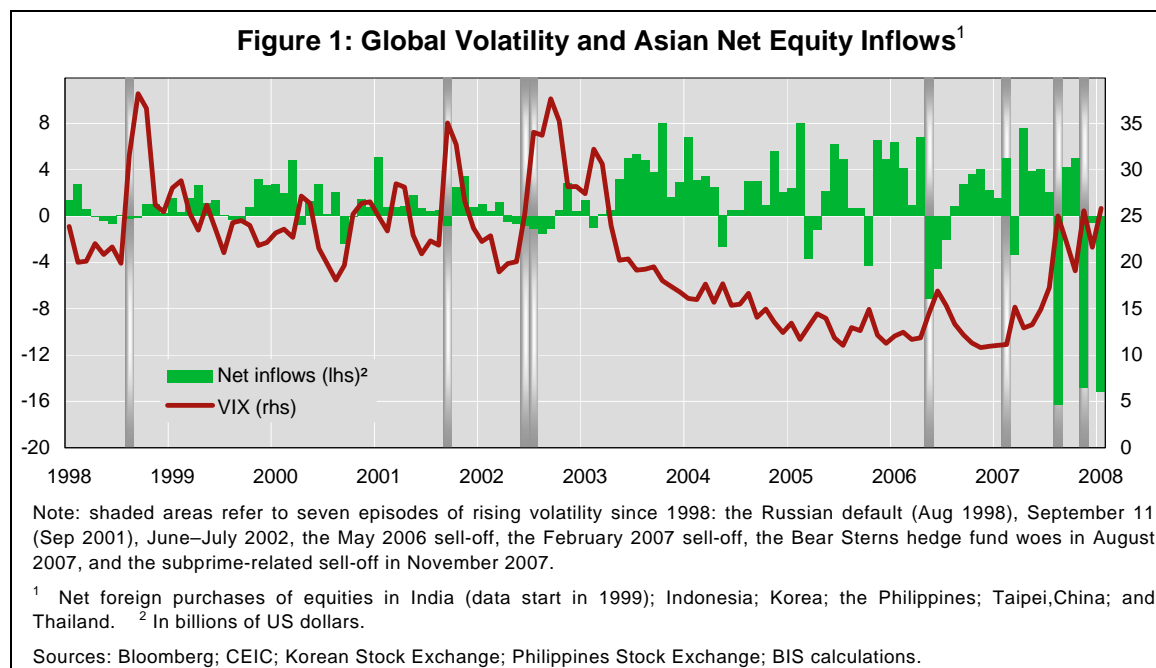
## **D. Carry Trades**

Carry trades have certainly gained in importance in the region in the last five years, although it is generally not possible to measure the stock of outstanding carry trades with any precision. Certainly, currencies in the region have tended to become more internationalized over the past three years, with a greater share of trading taking place offshore, often in non-deliverable form that is less constrained by domestic regulations. A new element is the tendency of market participants to put on carry trade with emerging currencies on both sides of the trade.

### **III. PORTFOLIO EQUITY FLOWS, EQUITY PRICES AND EXCHANGE RATES**

The capital inflows into Asia through purchases of equities have become larger and more volatile over the years. The scale of the pullback by foreign investors from Asian equities in episodes of global volatility in equity markets has gotten larger over the years, as shown below in Figure 1.

The bouts of disinvestment that have occurred since the summer of 2007 have been unprecedented. In the face of losses on mortgage securities, liquidity blockages in major money markets and prospects for decelerating growth, foreign investors liquidated over US\$12 billion in August and November in six Asian markets with daily transaction reporting. These liquidations have reached such levels notwithstanding the fact that global volatility (as measured by the VIX index of option prices on the Standard and Poor's index of US equities) has not climbed to the levels reached earlier in the decade or at the time of the LTCM and Russian defaults.



Even before this most recent episode, these flows have drawn much market commentary and such interest led a number of stock exchanges to release daily data on non-resident flows. This has resulted in a number of careful studies that have shed much light on the relationship between capital flows and equity prices. Two of these are reviewed below. Before turning to this analytic work, let us consider the source by geography and type of investor of the flows vis-à-vis Asian equity markets.

**A. Source of Inflows into Asian Equity Markets**

As for the source of the capital inflows, the national composition points to the importance of the United States and Europe. To be sure, Table 1 is dated, and recent flows within Asia, notably from Japan and Korea into China and India, have become more important.



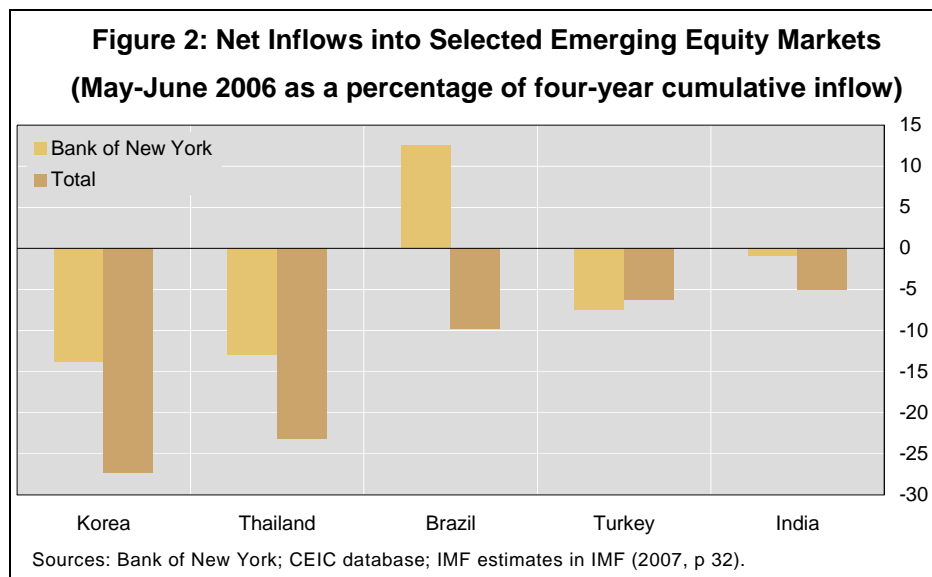
**Table 1: Foreign Equity Holdings in East Asia, End-2003  
(Millions of US dollars)**

Host	United States	Europe	Japan	East Asia including Japan	Total	<i>Memo: % of host GDP</i>
China	13,064	8,944	2,094	19,625	45,788	3.2
Hong Kong	36,210	35,223	5,594	7,901	92,889	59.3
Indonesia	4,406	2,542	89	922	12,597	6.0
Japan	255,496	175,975	-	5,569	493,763	11.5
Korea	49,121	27,702	708	3,579	92,822	15.3
Malaysia	4,075	4,862	296	3,258	14,544	14.0
Philippines	1,634	683	158	325	3,027	3.8
Singapore	21,932	12,579	1,280	4,096	42,857	46.9
Thailand	6,477	6,746	393	4,759	21,291	14.9
Total	392,415	275,256	10,612	50,034	819,578	
Total ex JP as host	136,919	99,281	10,612	44,465	325,815	
<i>Memo: %</i>	<i>42.0%</i>	<i>30.5%</i>	<i>3.3%</i>	<i>13.6%</i>	<i>100.0%</i>	

Note: Europe comprises Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. East Asia comprises the named economies.

Sources: Lee (2006: 32), based on IMF Coordinated Portfolio Investment Survey.

As for the importance of speculative accounts versus real money, the IMF (2007) has offered evidence that speculative accounts have more variable flows. In particular, cumulated inflows captured by Bank of New York, a major depository serving institutional investors like pension funds and mutual funds, in the four years before May-June 2006 proved much stickier in that episode than cumulated overall flows as reported by the stock exchanges (Figure 2). From this it may be inferred that hedge funds and proprietary trading desks account for more than their share of the volatility of flows in such episodes. In particular, it appears that such hot money investors disproportionately respond to higher levels of global volatility by liquidating positions in Asian equities. They might do so because of portfolio losses, higher measured portfolio risk (such as value at risk), induced deleveraging or other reasons.



#### B. Earlier Study of the Relationship between Equity Flows and Prices

Richards (2003) analyzed daily non-resident flows vis-à-vis six Asian equity markets and found that the flows both reflected price developments in major markets and affected price developments in the target markets. He found that for Korean, Taiwanese and Thai equities, a buoyant Standard and Poor's led to net purchase of equities by non-residents. And whatever drove the inflows into the six markets studied, he found that they affected the pricing in the target market. Inflows help to boost these asset prices, while outflows tend to lower them.

#### C. Chai-anant and Ho and the Exchange Rate Connection

The missing element in this earlier study using Asian daily data was the exchange rate. Market participants were interested to know the tendency of foreign purchases and sales of local equities not only in order to anticipate the trend of the local equity market, but also to assess how such flows could affect the exchange rate. Of course, in view of the style of intervention that leans against short-term volatility—particularly in India; the Philippines; and Taipei, China—one might expect the measured impact of portfolio equity flows on currency values to be weaker (in technical terms, one might expect the effect of large flows to be censored).

Chai-anant and Ho (2008) confirm findings of earlier studies that non-residents generally buy into rising regional markets and sell into falling ones. They also find that inflows push up currencies and outflows push down currencies. Their further finding that net equity flows show strong co-movement across six Asian equity markets (which was implied by Richards (2003)) suggests that equity capital flows may subject Asian economies to common shocks.

#### D. Asian Equities as an Option for, and Source of Liquidity to, Global Players?

If foreign investors chase returns in regional equity markets, and affect equity and currency values in the process, some further thinking is required on the procyclical nature of the international risk sharing implied by the substantial global holdings of Asian equities. In a global downturn, global investors do not act like they accept their share of the poor harvest in textbook fashion, but instead head for the exit. In effect, many of the foreign investors in

Asia are trading as if to replicate a long option on Asian growth. In other words, the equity risk that Asia lays off on the rest of the world returns to Asian portfolios under stressed market conditions.

Parallel to questions about the international allocation of Asian equity risk in normal and declining markets are questions about the provision of liquidity by Asia to global portfolios. In stressed markets, when equity markets are falling and credit spreads widening, Asian investors accommodate the liquidity demand of global portfolio managers by shifting into equities. If Asian central banks intervene to support their currencies, as many did in August 2007, they may reduce their domestic sterilization debt. In effect, local investors as a group switch out of risk-free domestic paper into risky equities at times of heightened volatility. To the extent that central banks sell low-risk US Treasury and agency debt (as in August 2007), global investors are able to switch from risky Asian equities to low-risk paper in the major currencies. The world has grown used to the oddity of countries with moderate incomes lending to rich countries. The further oddity of countries with moderate incomes systematically providing liquidity to the global investors in stressed markets needs to be taken on board.

#### **IV. NON-RESIDENT INVESTMENT IN LOCAL CURRENCY FIXED INCOME MARKETS**

Through the turn in the US dollar cycle in early 2002, it was a fair summary to say that local currency bond markets in East Asia remained generally insular (Jiang and McCauley, 2004). For instance, whereas non-resident holdings of Korean equities reached almost half of outstanding market capitalization, the measured holdings of Korean treasury bonds remained less than a percent of outstanding bonds.

Three developments in the intervening years have served one way or another to open up local currency bond markets. The first was the rise in inflation in Indonesia in the course of 2005, which led to a tightening of policy rates. Not only did short-term money-market rates rise, drawing in investors willing to bet against a corresponding depreciation of the rupiah. Also, similarly high bond yields drew in investors seeking both the immediate yield pick-up and an eventual capital gain as subsiding inflation permitted policy rates to return to single-digit levels. The second development took place less visibly in the derivative markets, where non-resident investors gained exposure to fixed income markets in a virtual manner. The third development was the growth of foreign banks in the domestic markets. Under certain conditions, they have emerged as major holders of local-currency government bonds to accommodate the hedging of dollar receipts by exporters.

It is not so much that foreign investors have sought out these markets because the impediments, be they withholding taxes or simply illiquidity, have been reduced (Takeuchi, 2006). Rather, foreign investors and banks have become active in these markets despite these impediments, using derivative markets or a local presence to get around the impediments on cross-border flows.

The following sections necessarily rely on different kinds of data to capture the behavior of foreign investors in the region's local currency bond markets. For Indonesia, data on holdings of short-term *Sertifikat Bank Indonesia* (SBI) and government bonds demonstrate how non-resident investors respond to global volatility. For non-resident investment in the rest of the markets, only indirect evidence of virtual investment can be assembled. In particular, the growth of interest-rate swaps and cross-currency swaps suggest the potential for non-resident activity, despite low measured holdings of government bonds.

## A. Non-resident Investment in the Indonesian Fixed Income Market

Foreign investors were drawn to substantial investment in Indonesian bonds only after the mini-crisis of 2005. That year, higher oil prices led to a deterioration of the government budget deficit, given subsidies. In addition, market participants perceived a slow monetary policy response to the inflationary challenge of higher energy prices. Eventually, a vigorous monetary tightening that saw the policy rate rise from less than 8% to 12.75% stabilized the exchange rate. Bonds offering similar yields amid expectations of a return to single-digit inflation and policy rates drew foreign investment despite challenging liquidity (e.g., a wide bid-ask spread) and a withholding tax.<sup>1</sup> By end-2005, foreign investors held 8% of Indonesian bonds and 12% of SBIs.

**Table 2: Foreign Investment in Rupiah Government Bonds and SBIs**

	Dec-05	Dec-06	Sep-07
1) Total SBI stock (IDR tn)	121.3	207.4	255.5
2) SBIs owned by foreigners (IDR tn)	14.8	18.1	31.2
3) % owned by foreigners = 2 ÷ 1	12.2%	8.7%	12.2%
4) Total IDR government bond stock (IDR tn)	399.8	418.8	466.1
5) Bonds owned by foreigners (IDR tn)	31.1	54.9	76.3
6) % owned by foreigners = 5 ÷ 4	7.8%	13.1%	16.4%
7) Total foreign-owned SBI and bonds = 2 + 5 (IDR tn)	45.9	73.0	107.5
8) Total foreign-owned SBI and bonds in USD bn	4.7	8.1	11.8

Sources: Ministry of Finance and Bank Indonesia

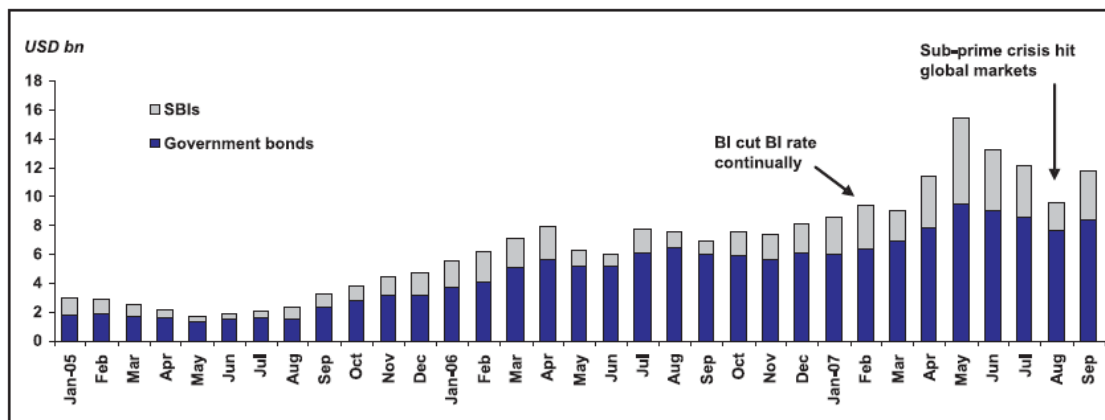
Foreign investors have not monotonically increased their holdings of Indonesian bonds and paper, as one might expect if the globalization of portfolios were the only force at work. Instead, one observes foreign investors selling into a declining market. Four episodes have been revealing: mid-2005, May-June 2006, February-March 2007 and July-August 2007.

As noted, in the middle of 2005, the sell-off in the Indonesian market was idiosyncratic, owing to concerns about Indonesian policies. Foreign investors reduced their holdings gradually in the first half. Holdings of SBIs started to recover before the exchange rate bottomed in August 2005 at 12,000 rupiah/dollar, while bond holdings only resumed their expansion in the following month.

The following three episodes were global in origin. They featured sell-offs in equity markets and rises in equity and exchange rate volatility. Investment in Indonesian fixed income instruments responded as one might expect speculative investors to behave in the face of losses elsewhere in their portfolios and/or an increase in risk as measured by such popular metrics as value-at-risk. In May and June 2006, foreign investors reduced their exposure to Indonesian fixed income instruments in a much sharper and more concentrated manner than they had in mid-2005, when Indonesian policies were at issue. The subsequent disturbance of February-March 2007 had a smaller effect in Indonesia (as elsewhere). The decline of holdings in June-August 2007 may have started from concerns that policy rates had been lowered too far or too fast. But the global events arising from losses in US mortgage lending, spreading to a disabling of leveraged financing more generally, led foreign investors to reduce holdings sharply in August.

<sup>1</sup> Ichsan (2007) also cites market participants' view that Indonesia might be upgraded to "investment grade" after the 2009 elections."

**Figure 3: Foreign Investment in Rupiah Government Bonds and SBIs**



Sources: Ministry of Finance and Bank Indonesia

Source: Ichsan (2007).

While different in origins, these latter three episodes send a consistent message. Foreign investment links the Indonesian fixed income market and the rupiah’s exchange rate to global equity and credit developments. As with equities above, fixed income flows respond to global developments and move the local market. Further, there appears to be an element of stop-loss trading. Thus, downward movement of the Indonesian bond market and the rupiah may induce selling, putting further pressure on both.

What is strikingly consistent across all the episodes is that the foreign investment in SBIs is more responsive to uncertainties (whether in Indonesia or globally) than that in government bonds. One is tempted to associate SBI investment with more leveraged accounts and bond investment with more “real money” accounts. There maybe something to this supposition. But it must also be recalled that the liquidity and thus the overall cost of a cycle of selling and buying differs across money and bond markets. Thus leveraged or real money accounts alike that hold both may face a cost incentive to reduce exposure by selling SBIs rather than government bonds. The fact that government bonds attract a withholding tax while SBIs do not works in the same direction. To the extent that the tax liability is managed through structured notes bought offshore from market-makers, unwinding the bond position may require a transaction with the market-maker that produced the structured note, possibly resulting in lower liquidity and higher cost trading than the underlying government bond itself.

The evidence of greater heat in the flow into SBIs has led to a debate in Indonesia whether inflows into these securities should be in some manner or another discouraged. The discussion of policy below takes up a change in policy along these lines.

**B. Virtual Bond Investment through Derivatives**

While other bond markets in Asia have received little in the way of cash investment from non-residents, the development of fixed-income derivative markets has allowed considerable indirect participation by non-residents in the region’s bond markets.<sup>2</sup> A foreign investor that foresees a decline in long-term interest rates in a given market may find it inconvenient, from the standpoint of taxation or liquidity, to buy a local-currency government bond. Much the

<sup>2</sup> For a description of derivatives markets in the local bond markets, see Hohensee and Lee (2006).

same position can be taken in the cross-currency swap market: the investor can contract to receive a stream of fixed-rate payments in the local currency against floating-rate payments in US dollars. Should monetary policy be unexpectedly eased and were long-term interest rates to fall (or were long-term rates to fall for any other reason), the position could be closed out at a profit. If the currency exposure were not desired, the investor could use the interest-rate swap market to contract to receive fixed-rate local currency payments against floating-rate local payments. Such positioning would be currency-neutral, but would put downward pressure on long-term interest rates all the same.

Preliminary data from the 2007 triennial central bank survey point to generally strong growth of the derivative markets that permit non-resident investors access to Asian markets (Table 3). A tripling of daily volumes in currency swap markets was not uncommon. Only in the New Taiwan dollar and Thai baht was a decline in currency swaps observed. Even then, interest-rate swaps in the baht expanded briskly, in line with the trend elsewhere.

The participants in the region's virtual bond markets vary across markets and over time. For instance, at the time of the Thai coup d'état of September 2006, multinationals in Thailand were said to have sold forward their Thai baht profits against US dollars, using the cross-currency swap market. This would make most sense in the case of multinationals selling into the home market, seeking to hedge the dollar (or eventually the yen) value of baht profits. On the other side of the market were hedge funds that were betting that the Bank of Thailand would ease, perhaps before the Federal Reserve, in the face of the appreciation of the currency and lagging government investment spending.<sup>3</sup>

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<sup>3</sup> Because the multinationals contracted to pay fixed-rate baht against receipt of floating-rate dollars (a cross-currency swap), while hedge funds contracted to receive fixed-rate baht against receipt of floating-rate baht (an interest-rate swap), the arranging investment bank would square the deal by selling floating-rate baht against floating-rate dollars (a series of forward sales of baht against dollars or a so-called basis swap).

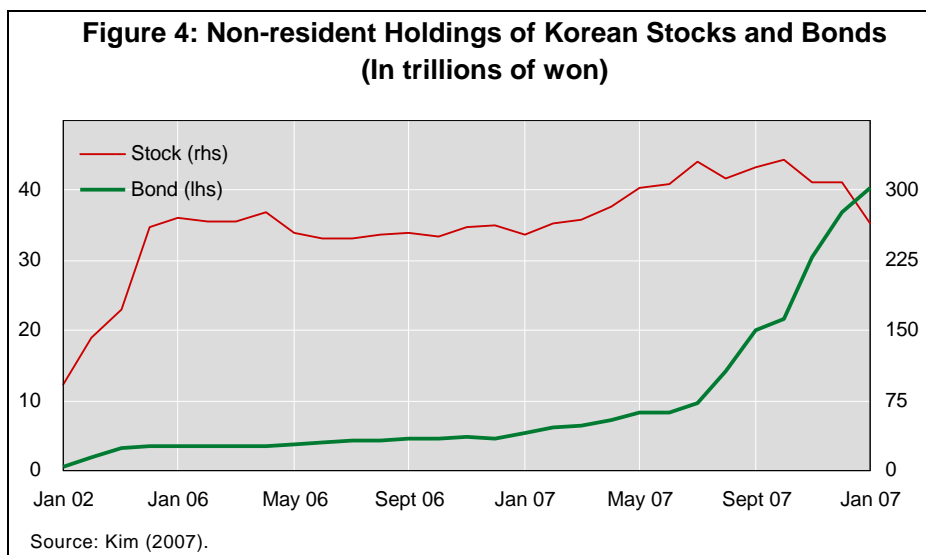
<b>Table 3: Turnover of Interest-Rate Swaps and Currency Swaps in Asia-Pacific Currencies</b>				
<b>(Daily averages, in millions of US dollars)</b>				
	Interest Rate Swaps		Currency Swaps	
	April 2004	April 2007	April 2004	April 2007
Australian Dollar	6,609	14,060	1,573	1,824
Chinese Renminbi	n.a.	151	4	133
HK Dollar	3,819	8,778	293	420
Indian Rupee	396	3,329	97	411
Indonesian Rupiah	14	17	24	148
Japanese Yen	35,433	109,682	3,354	3,495
Korean Won	301	3,942.	342	1,303
Malaysian Ringgit	26	166	11	37
New Zealand Dollar	1,072	5,550	80	474
Philippine Peso	1	3	4	13
Singapore Dollar	1,588	2,291	54	154
New Taiwan Dollar	355	891	102	99
Thai Baht	96	321	246	59

Source: BIS, Triennial Central Bank Survey, 2005, 2007.

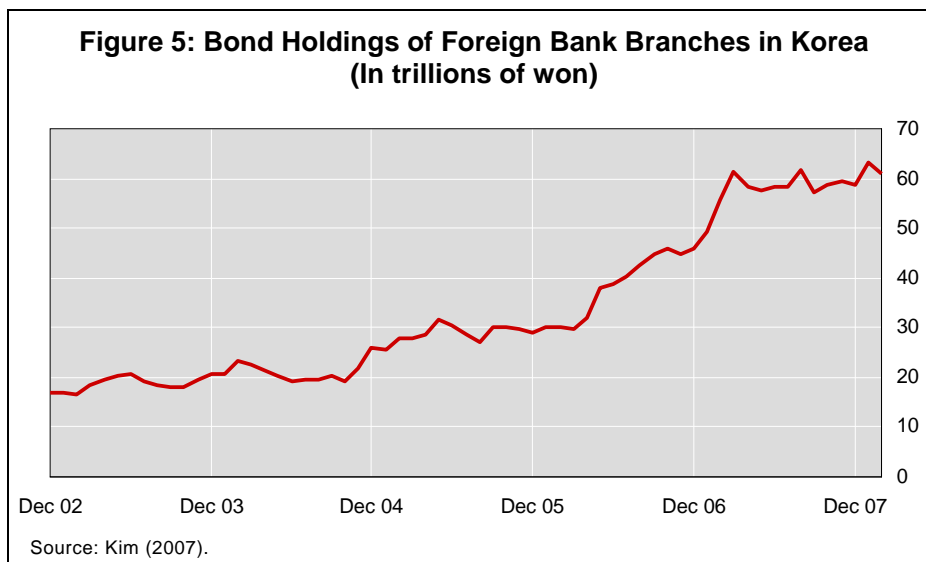
A more recent example is from the Korean bond market (Carrillo-Rodriguez and Hohensee, 2007). There, shipbuilders are said to be hedging US dollar revenues to be earned on deliveries of ships scheduled for two or three years from now (Bank of Korea and FSS (2008)). They are in effect borrowing in US dollars and investing the proceeds in won bonds. Unlike in Thailand in September 2006, this hedging demand did not have a speculative counterparty. Instead, to some extent, it was matched by Korean companies that sold medium term notes in US dollars and swapped the proceeds into won. (These companies would in effect cheapen their won fixed-rate borrowing by selling the dollar paper and contracting to pay won and receive dollars to pass on to the medium-term note holders.) In addition, however, foreign banks in Korea accommodated the shipbuilders' forward sales of dollars by borrowing dollars from affiliates outside of Korea, swapping the proceeds for won and investing the won in the Korean bond market. This is taken up in the next section.

### **C. Bond Investment by Foreign Banks**

Korea serves as a prime example of a government bond market that has become globalized thanks to the participation of foreign banks. Holdings of Korean bonds by non-residents remain very low, at less than 2%. This is in striking contrast to the one-third share that non-residents hold of Korean equities (Figure 4).



It can thus be said that the Korean bond market is not internationalized. At the same time, however, foreign banks in Korea have become significant holders of Korean government paper (Figure 5). Kim (2007) reports that foreign investors and foreign bank branches in Korea together hold a quarter of government bonds and monetary stabilization bonds outstanding.



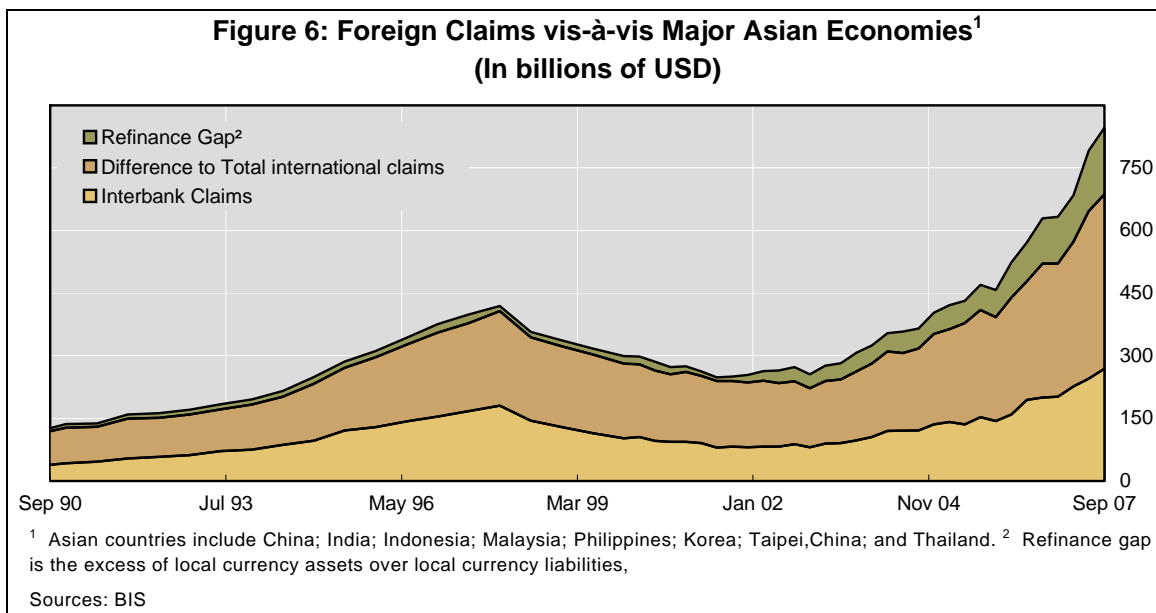
**D. Summing Up**

In various ways, the bond markets in East Asia are falling under the influence of global fixed income developments. In Indonesia, the market has hosted significant direct holdings by non-residents (as well as further investment through structures sold offshore by foreign banks with a local presence). In places like Thailand and India, foreign investors have gained access to the local bond market through derivatives to an extent that eludes measurement. And in Korea, foreign bank branches have become important holders of government bonds as they have accommodated the long-term forward sales of Korean exporters.



### V. RETURN OF BANK INFLOWS

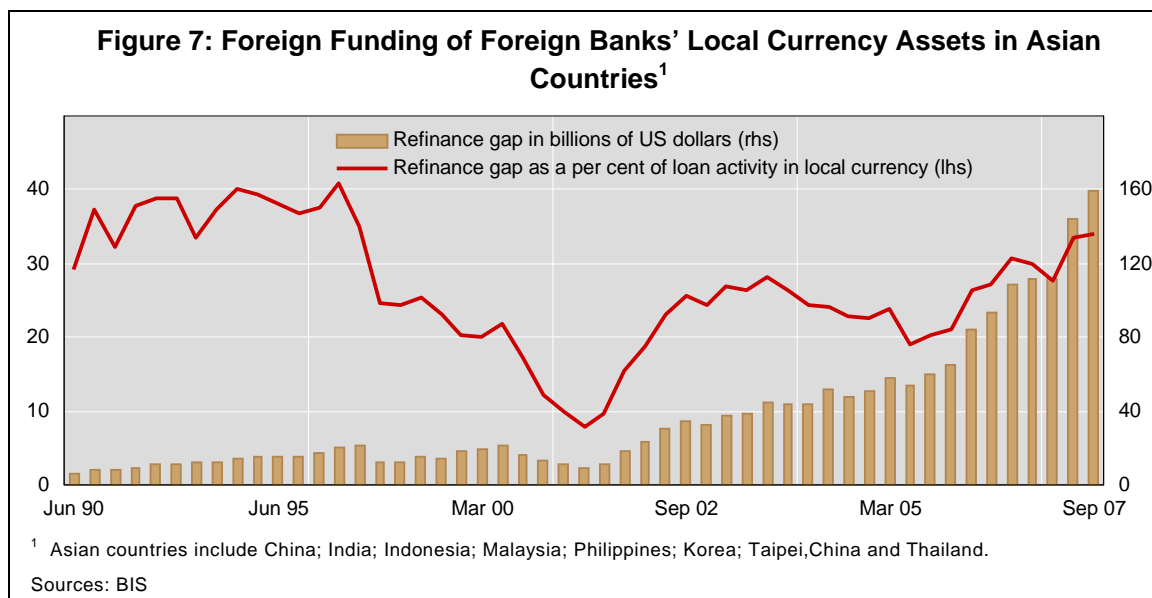
Since the peaking of the dollar in early 2002, the claims of Bank for International Settlements (BIS)-area banks on the major Asian economies have bottomed. The rise has been observed across the different categories of foreign claims: cross-border interbank claims, other international claims and net local claims in local currency (the refinance gap).



In the early years of this decade, one could consider the growth of local claims as a development apart from the evolution of cross-border loans.<sup>4</sup> Indeed, after the crisis, Asian firms and banks repaid cross-border debts while increasing their borrowing in local currency from foreign banks. And these in turn mobilized local funding to finance the bulk of their local currency assets.

This has changed. As Figure 7 below shows, the refinancing gap, or the difference between foreign banks' in-country domestic currency assets and liabilities, has grown. In short, at the margin, foreign banks have come to depend heavily on funds borrowed from their affiliates abroad and swapped for local currency. By September 2007, a third of foreign banks' local assets were funded cross-border in these major Asian economies.

<sup>4</sup> Or even as reflecting different strategies. See McCauley, Ruud and Wooldridge (2002).



## VI. CARRY TRADES

Carry trades refer to positions taken across currencies that seek to profit from interest rate differentials in excess of currency movements over the holding period. Such trades can be defined narrowly to include only speculative positions, or more broadly to include in some sense overweighted positions in high-coupon currencies in “real money” portfolios.

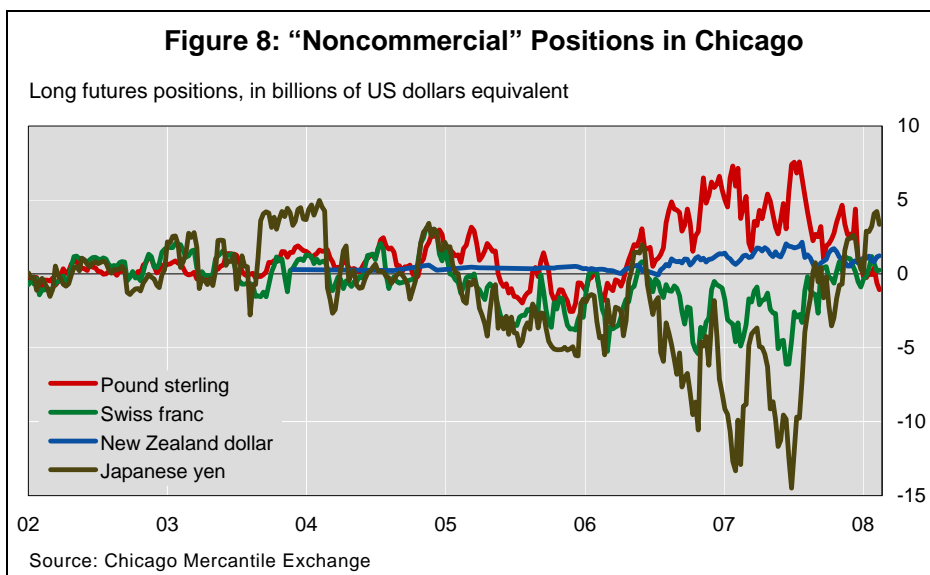
### A. Measuring Carry Trades<sup>5</sup>

One would like to know the scale of such positions and thus obtain some idea of the potential market movement should the positions be reversed. To recognize the salience of such measures, one only has to recall how in late 1998 the dollar/yen experienced a double-digit move over several days as hedge funds, proprietary trading desks and institutional investors bought back yen that they had previously sold short.

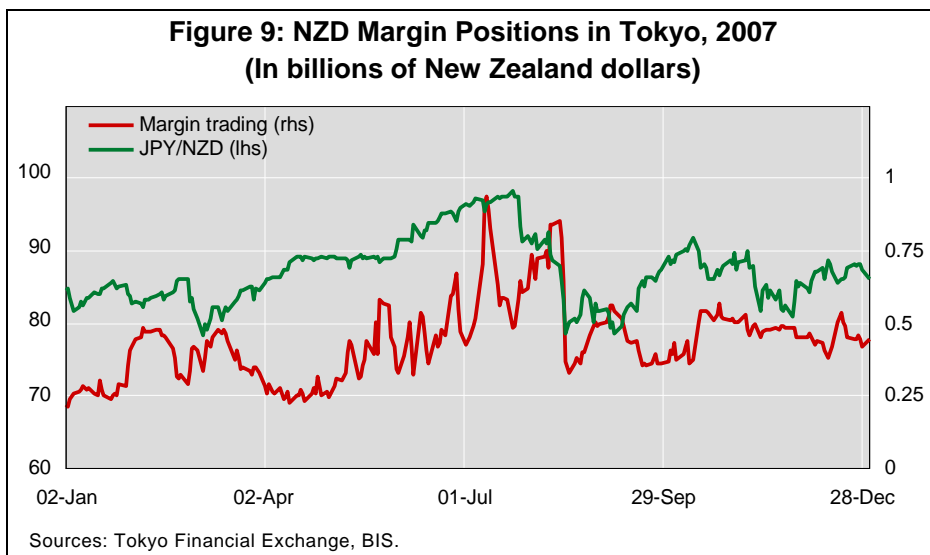
Unfortunately, the scale of carry trades eludes measurement. Data on the positioning of different classes of traders in the Chicago currency futures markets are perhaps the most often referred to data (Figure 8). Yet the Triennial Central Bank Survey of foreign exchange trading for 2007 has once again underscored the fact that futures trading is a small corner of the overall market for foreign exchange (BIS, 2007). Moreover, given the selection process for participants in this market, which substitutes exposure to the exchange as a whole for individual counterparty exposure, there is no reason to believe that positions taken in futures can be taken as representative of broader positioning.

All that said, these data give the flavor of the reversal since last year of carry trades. Short positions in the yen and the Swiss franc have been cut back sharply, and long positions in sterling and the New Zealand dollar have likewise been much reduced.

<sup>5</sup> This section draws on Galati et al (2007).



Within Asia, the positioning by Japanese individuals in forward trades has similarly gotten a lot of attention. These data showed a sharp abandonment of long positions in high-yielding Antepodean currencies in August 2007. The decline in margined holdings of New Zealand dollars was very sharp last summer as the currency plunged against the yen (Figure 9). This observation is consistent with a market practice of closing out losing positions automatically rather than issuing margin calls. But again, these positions add up to only several hundred billion yen.

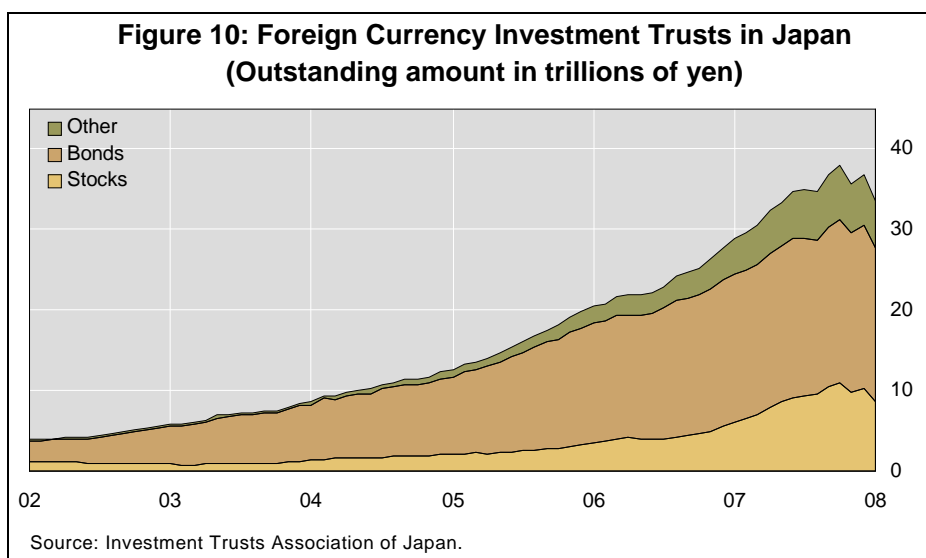


Broader efforts to use flows of fund or international banking data from McCauley and Kleist (1998) to Galati et al. (2007) or Hattori and Shin (2007) cannot be judged successes if the goal is to provide a convincing measure of the scale of carry trades. The basic difficulty is that, while one can think of a carry trade being constructed through a speculator borrowing yen from a bank and selling it in the spot market in order to buy a higher-yielding asset, in practice the transaction need not take this form and thereby leave a yen asset for a bank to

report.<sup>6</sup> Large speculative players are more likely to preserve their balance sheets and to achieve much the same end by swapping dollars for yen and then selling the yen, in effect setting up a short forward position. A position in the Brazilian real, South African rand or Indonesian rupiah funded with yen can be established with a short position in the yen versus the US dollar and a long position in one of these currencies against the US dollar.

Thus the positions that one can measure through yen loans might be part of a larger position including unmeasured forwards. And, over time, measured positions might be substituting for unmeasured forward positions.<sup>7</sup>

If one widens the definition of carry trade to capture real money overweight positions in high-yielding currencies, then measurement becomes more possible. Thus, data from the Japanese securities firms can be used to measure the outflow of Japanese funds into foreign bond and equity funds. These data show massive outflows into bonds and equities amounting to tens of trillions of yen, not the hundreds of millions into the forward positions examined above (Figure 10). Data in recent months show a downturn of holdings. This suggests at minimum that new inflows have not offset valuation losses as the yen has appreciated and equity markets have corrected.

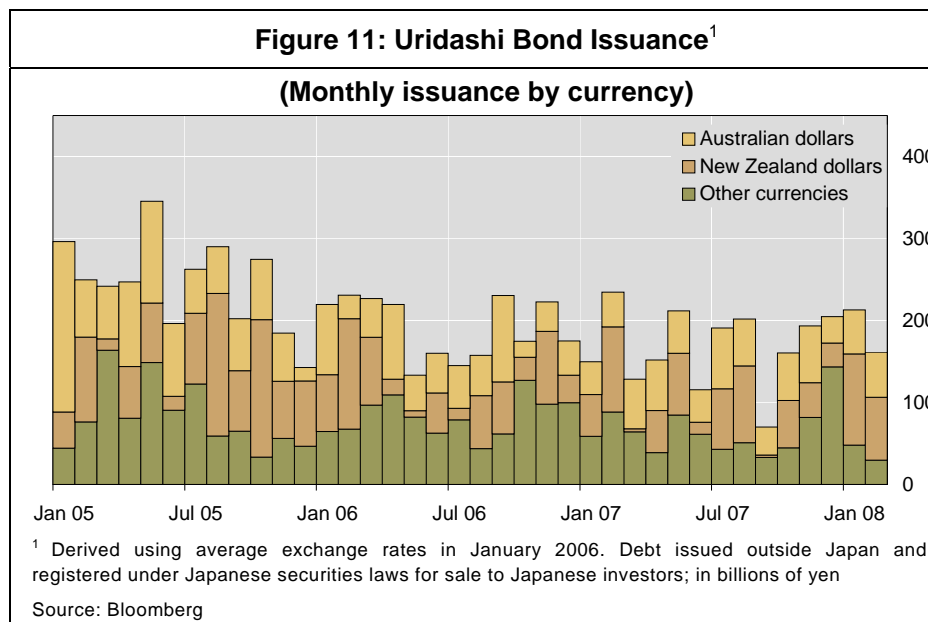


In addition, one can look to the primary market and measure the higher-coupon international bonds that are marketed directly to households and other investors under the Uridashi rules (Nishi and Vergus (2006)). Market participants in Australia and New Zealand track these data against the backdrop of scheduled redemptions for possible pressures on the Australian and New Zealand dollars. In fact, in August 2007 as the AUD/JPY and NZD/JPY sank precipitously, the primary market did dry up entirely for the New Zealand dollar and

<sup>6</sup> In the case of carry trades in government bonds, Borio and McCauley (1996) were able to use repo transactions as a measure of the funding of holdings of bonds. Short-term money-market positions can be established, by contrast, with forward positions that cannot be similarly measured.

<sup>7</sup> Hattori and Shin (2007) infer an expansion of carry trades from outflows of yen from the Japanese banking system to the rest of the world. Recall, however, that for a time Japanese banks' credit standing was such that they had difficulty borrowing dollars outright and thus resorted to foreign exchange swaps. These put yen into the hands of foreign banks, some of which ended up as deposits with the Bank of Japan. As Japanese banks have regained access to direct dollar funding, foreign banks may have had to obtain yen directly as well. To the extent that on balance-sheet yen borrowing by foreign banks substituted for obtaining yen through swap transactions, the outflow that Hattori and Shin measure may not be associated with an increase in yen funding of carry trades.

largely for the Australian dollar (Figure 11). Many would presume that the proceeds of maturing bonds were converted into yen and that therefore the long position of Japanese investors in the two currencies took a dip. In percentage terms, this decline would be nothing like that observed in the forward trading of Japanese households, but, in value terms, it would be comparable.



A wider definition of the carry trade to include portfolio diversification that favors high-yielding currencies is necessary to consider foreign holdings of Bank Indonesia paper as a measure of carry trade activity. That is, included among holders of such paper would be international bond funds for institutional and individual investors, not just leveraged accounts.

**B. Carry Trades across East Asian Currencies**

A recently popular form of the carry trade has been to set up positions across emerging market currencies. Such trades are particularly attractive if the currency pairs are seen to react in similar fashion to broader price movements, such as dollar/yen, equity prices or equity volatility. Thus, one trade that was recommended early in 2007 was a long position in Indian rupee against a short position in the Chinese yuan. Since both legs would be set up in nondeliverable contracts, calling the renminbi the “funding” currency is a figure of speech more than a description. This recommendation could be seen as a bet that the Reserve Bank of India would have a harder time sterilizing capital inflows amid booming bank lending, very rapid growth of corporate capital spending and a current account deficit than the People’s Bank of China. In the event, of course, the rupee has been allowed to rise substantially against the US dollar, while the People’s Bank of China has contained the rise in the renminbi.

More recently, Hohensee (2007) has argued that the persistence of interest rate differentials in East Asia against the backdrop of currencies showing an increasing stability against the currencies of their trading partners creates opportunities for carry trades. The analogy is drawn to the lead-up to monetary union in Europe, when the carry trade was dubbed the convergence trade in light of the commitment to exchange rate stability and inflation and interest rate convergence. Carry trades along these lines would use low-yielding currencies

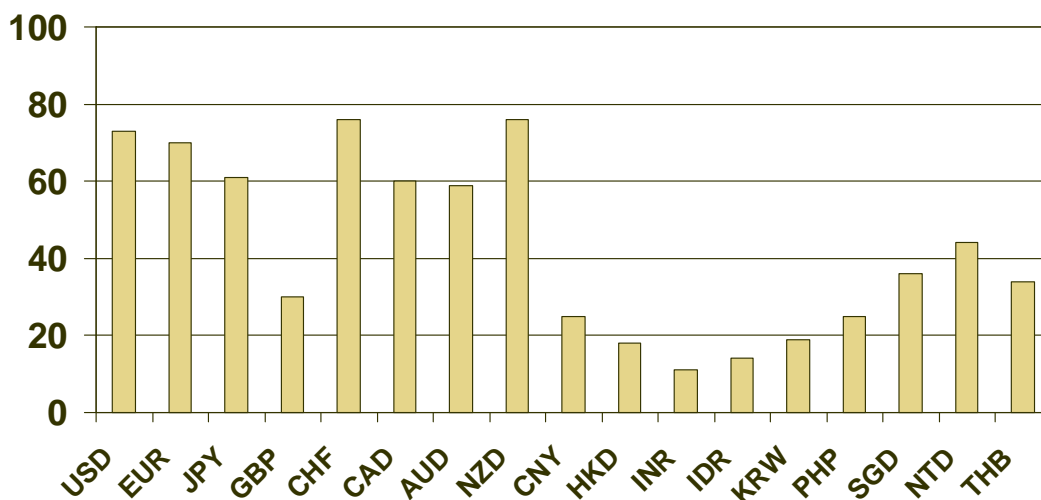
like the Singapore dollar or New Taiwan dollar to fund positions in higher yielding currencies like the Indonesian rupiah or Philippine peso.

**C. Evidence from the Triennial Survey**

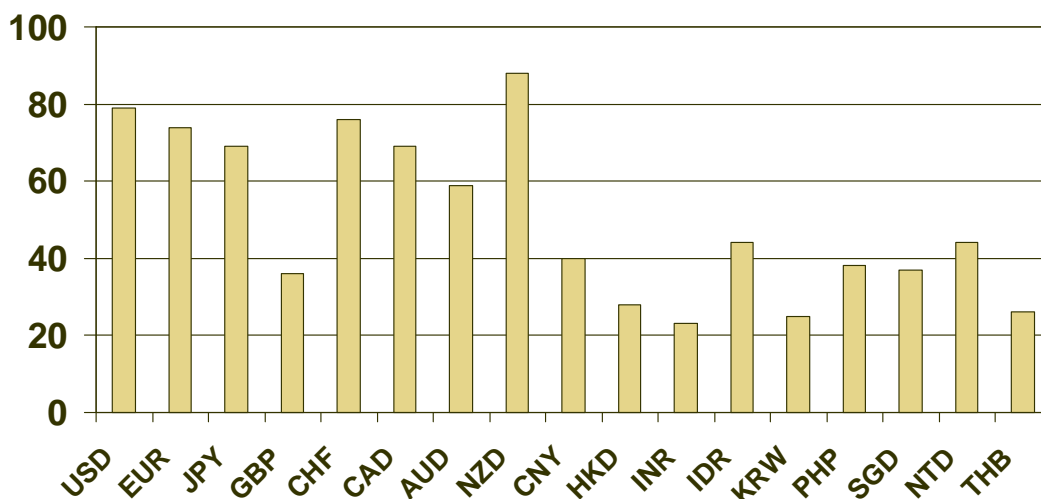
Judging from the results of the April 2007 Triennial Central Bank Survey of foreign exchange markets (BIS, 2007), activity offshore in Asian currencies tended to grow faster than that onshore. As a result, these currencies tended to become more internationalized (Figure 12). While a similar phenomenon is observed across a wide range of currencies, in much of East Asia, this shift occurred in the face of restrictions on deliverability of the currency offshore. This set of observations is consistent with the supposition that carry trades are becoming relatively more important in regional foreign exchange markets.

**Figure 12: Offshore Trading as a Share of Total Trading of Currencies**

April 2004



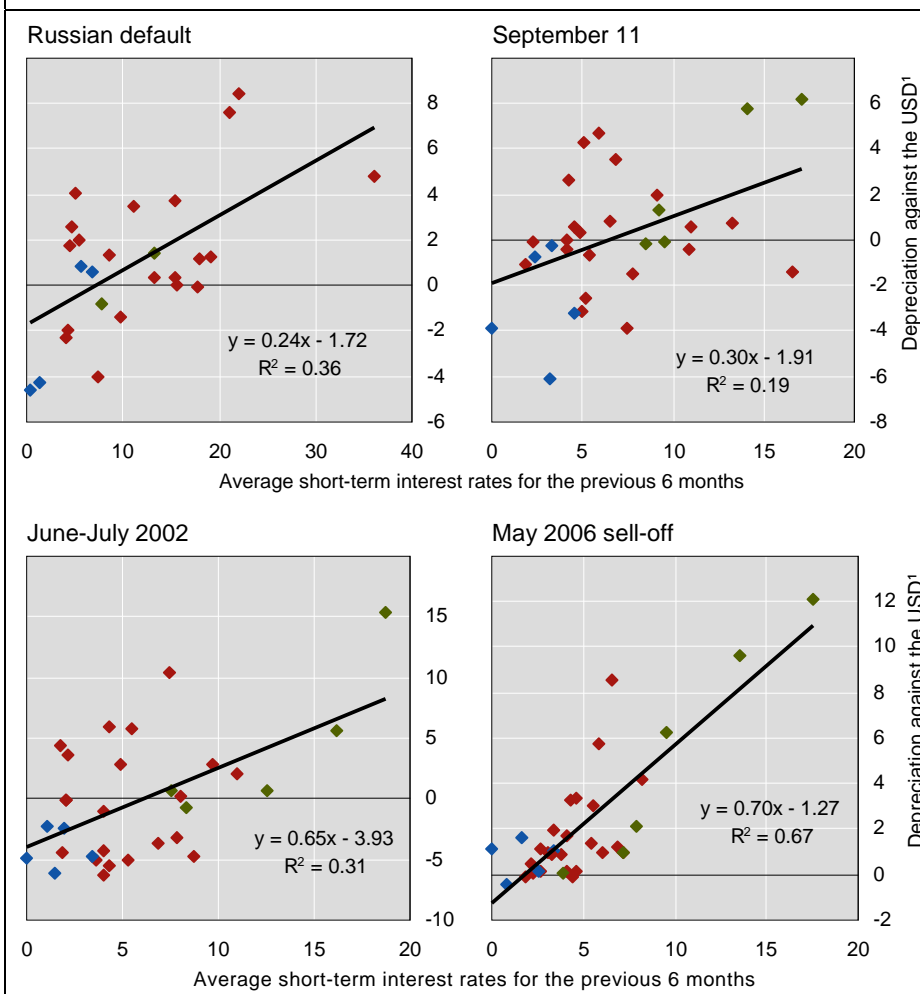
April 2007



**D. Inferring Carry Trades from Currency Performance and Global Volatility**

If the carry trade cannot be measured, it can be inferred from price action. Cairns et al. (2007) looked at the relationship between currency performance and equity market volatility. One can think of rises in equity volatility as forcing deleveraging of speculative positions through a number of channels. Higher volatility will raise values at risk; or higher volatility can be taken as a proxy for risk aversion; or higher volatility can be associated with lower wealth or capital since volatility tends to rise as equity markets sell off. Whatever the channel, Cairns et al. (2007) found an association between equity volatility and currency performance that is in turn most closely associated with interest rate levels. This relationship is found in the overall time series and in episodes of spikes in equity volatility. These latter lend themselves to graphical presentation (Figure 13 and 14).

**Figure 13: Unwinding of Carry Trades: Selected Episodes during Heightened Volatility**



Note: Blue markers represent generally low-yield currencies (JPY, CHF, SGD, TWD and EUR), while green markers represent relatively high-yield ones (TRY, IDR, BRL, RUB, PHP and INR). Currencies with interest rates above 40% and those fixed to the USD are excluded. HKD 12-month forward and CNY 12-month NDF are used to represent HKD and CNY respectively. For Russian default, inclusion of RUB, IDR, TRY, ARS and BRL results in slope of 0.1266 and  $R^2$  of 0.0393. For September 11, inclusion of TRY, ARS and MYR results in slope of 0.1201 and  $R^2$  of 0.2390. For June-July 2002, inclusion of TRY, ARS and MYR results in slope of 0.2399 and  $R^2$  of 0.2735. Interest rates are either money market rates (60b) or treasury bill rates (60c) from the IMF.

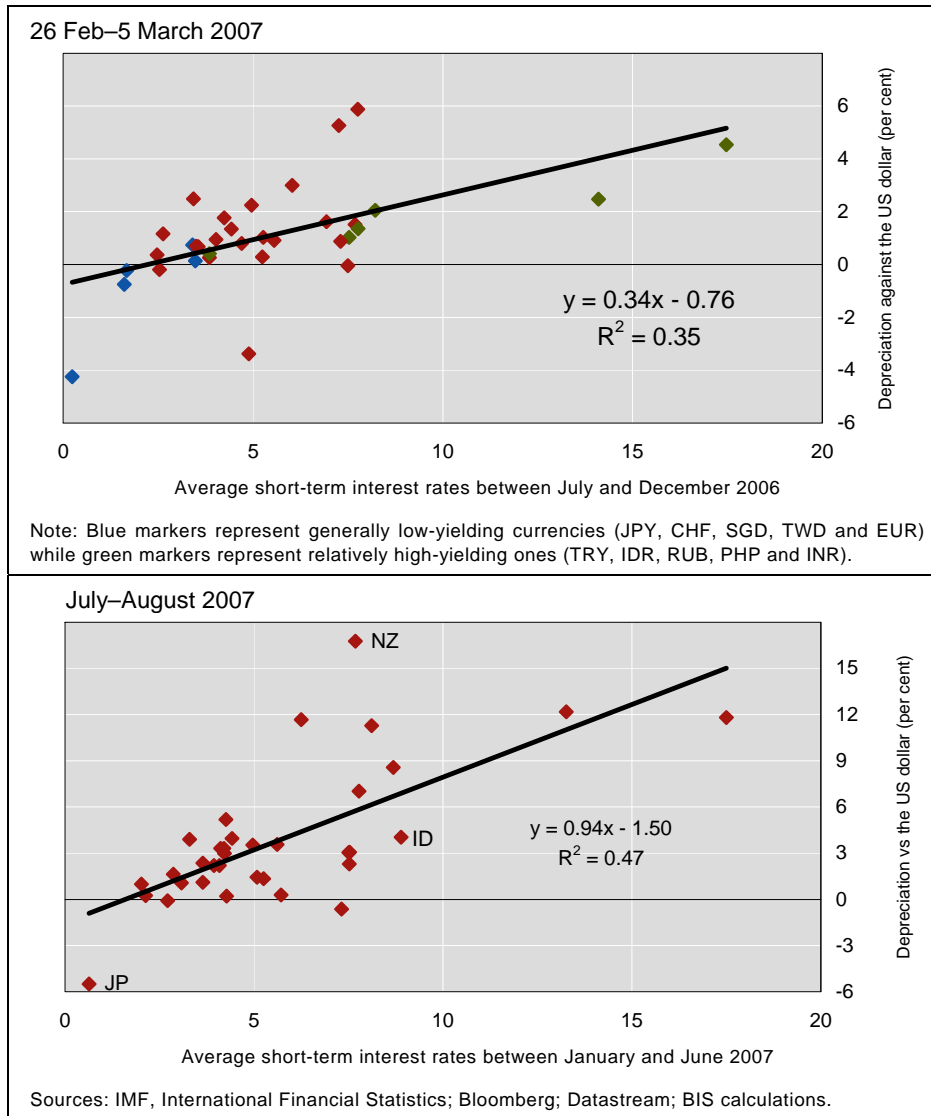
<sup>1</sup> In percent.

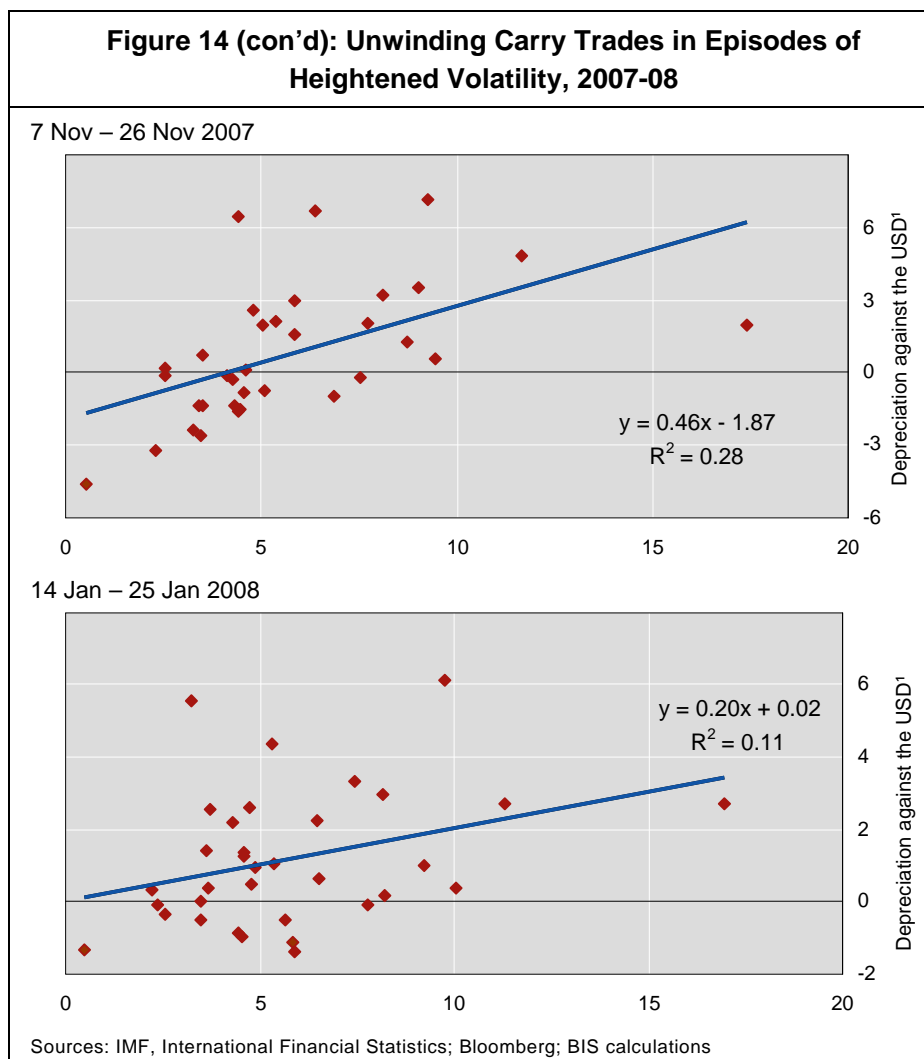
Sources: Bloomberg; IMF, *International Financial Statistics*; BIS calculations.



Since the publication of Cairns et al., four further spikes have confirmed out of sample the cross-sectional relationship between interest rate levels and currency performance at times of heightened volatility. It might be noted that the relationship was not all that strongly in evidence in the spike of volatility in January-February 2008.

**Figure 14: Unwinding Carry Trades in Episodes of Heightened Volatility, 2007-08**





**E. Summing Up**

In summary, carry trades elude measurement but form an important class of capital flows into and within East Asia. An ability to measure speculative positions subject to stop-loss management, such as the forward trading of Japanese households, represents an exception to the general rule of unobservable positions. Still, there are strong indications that carry trades involving Asia-Pacific currencies are substantial. There are more limited indications that carry trades across emerging market currencies are gaining in popularity.

**VII. POLICY RESPONSES**

Grenville (2008) reviews the full range of policy responses to abundant capital inflows. This section focuses more narrowly on policies toward capital flows.

Many economies in the region have responded to the inflow of capital by liberalizing capital outflows. The market timing of such liberalization, however, has tended to work against an immediate strong response by private parties. If domestic asset prices are performing well and pressure on the currency to appreciate is evident, why invest abroad now?

The authorities of a number of major economies have also responded to strong capital inflows by restricting certain capital inflows, particularly bank inflows. Below, these measures are described and the prima facie evidence of their effects is consulted.

### **A. Liberalizing Capital Outflows**

In response to strong capital inflows, the authorities in a broad range of Asian economies have liberalized capital outflows. These measures have been taken since the dollar peaked in 2002 but their adoption has accelerated in recent years in Korea, China, India, the Philippines and Thailand. These measures simultaneously signal the authorities' comfort with their international liquidity position and their discomfort with adding to official reserve holdings. The following is by no means an exhaustive account, but describes some of the measures taken.

In mid-2005 Korea's Overseas Investment Activation Plan abolished ceilings on overseas finance and insurance business investment by non-financial institutions and raised the limits on real estate acquisition abroad and overseas direct investment by individuals. The May 2006 Foreign Exchange Liberalization Plan further accelerated the schedule of an earlier plan (announced in 2002) to liberalize foreign exchange transactions by Koreans. In 2007, limits on outward investments were eased further and the process of making such investments was made less burdensome.

In April 2006, the Chinese authorities put in place the Qualified Domestic Institutional Investors (QDII) scheme. Households and firms were allowed to invest in fixed income products through licensed banks and fund managers to the extent permitted by pre-set quotas. A year later, investment in equities was permitted. With an expansion of quotas for banks, insurance companies and investment funds in 2007, the total amount authorized stands at US\$42.1 billion at writing. At the same time, individuals have been allowed to convert renminbi into dollars in the amount of US\$50,000 per year (Ma and McCauley, 2007, p. 21).

Since 2006, India has also eased the limits on various institutions and individuals to invest abroad. Listed companies may invest up to 35 percent of their net worth in portfolios abroad, mutual funds up to US\$4 billion and individuals up to US\$100,000 a year.

Early last year, the Philippines allowed residents to invest abroad without prior central bank approval, and doubled the limits to US\$12 million per year (Yap, 2008, p. 24). Net open position limits on banks' foreign currency holdings were relaxed to allow them to hold substantial long positions in dollars so as to make the foreign exchange more liquid.

In the face of a sharp upward move in the baht in July 2007, the Bank of Thailand relaxed regulations on outward capital flows. The measures include the abolishment of the surrender requirement for Thai exporters. With the abolition of the unreimbursed reserve requirement in March 2008 (see below), the Ministry of Finance announced that state-owned enterprises would be encouraged to swap foreign currency debt into baht, and the government pension fund, the social security fund and domestic financial institutions would be encouraged to invest more abroad.<sup>8</sup> The Securities Exchange Commission approved another US\$12 billion in overseas portfolio investment quotas.<sup>9</sup>

Korea has no doubt enjoyed the greatest success in promoting capital outflows. On top of the fairly steady outflow of direct investment, not least to China, have come recently liberalized portfolio outflows. Outflows favored Chinese and Indian shares. Kim and Yang

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<sup>8</sup> The Ministry of Finance also pledged to favor baht debt in the financing of the "mega-projects" for infrastructure. Note that reducing government debt denominated in foreign currency in favor of government debt denominated in baht is similar in its effect on asset stocks to sterilized intervention by the Bank of Thailand.

<sup>9</sup> Notwithstanding these measures, Wilaipich and Harr (2008) lowered their forecasts of the dollar/baht rate, indicating a stronger baht was expected.

(2008, p. 5) say, “It is surprising that equity investment abroad increased so rapidly in a single year, from \$3.6 billion in 2005 to \$15.2 billion in 2006.” Net private capital flows actually recorded an outflow equivalent to 2% of GDP in 2006. Kim and Yang expect the outflows to continue, ascribing them to risk diversification and profit-seeking, motives which have not exerted the same force elsewhere. Whether the government’s fiscal incentives have played a role remains to be analyzed. While a substantial fraction of the portfolio equity outflows were currency hedged, so that these outflows did not all contribute to a supply of won to the foreign exchange market, the scale of the capital outflows is remarkable.<sup>10</sup>

The lesson would seem to be that liberalization of equity outflows has the greatest potential. This exception may be economies with very low short-term rates, as on the Japanese yen and the New Taiwan dollar, where strong outflows can favor fixed income investments. On this view, the reluctance of the Chinese authorities to allow outflows into equity markets abroad—in part owing to the risk to local share prices of allowing flows into cross-listed shares trading at a discount in Hong Kong—has prevented capital outflows from taking some of the pressure off the currency.

## **B. Restricting Capital Inflows**

Major economies in the region have responded to strong capital inflows with measures to restrict them, embraced not so much in principle as in practice. In different ways, authorities have reached back to formerly used measures, made existing restrictions on capital outflows symmetric, and adopted new restrictions or adapted other policies to serve the felt need for restricting inflows.

Thus, far from a limited exception to a clear trend toward greater acceptance of capital inflows, the Thai measures to restrict inflows into the Thai bond market of late 2006 are of a piece with a series of policies taken in China, India and Korea. Even in Indonesia, where equity, bond and money markets have de facto been among the most open in the region, there is a debate about restricting capital inflows into the money market.

The following sections describe and analyze measures adopted to restrict capital inflows in chronological order: China, September 2006; Thailand, December 2006; Korea, April 2007; and India, August 2007. In each case a description of the measure is followed by an assessment of the apparent effect on the relevant flows, and an assessment of the price impact. The reader is reminded that capital inflows that are blocked through one channel can find another channel, so what follows is no more than a partial assessment. That said, the price evidence should probably be given more weight than the flow evidence.

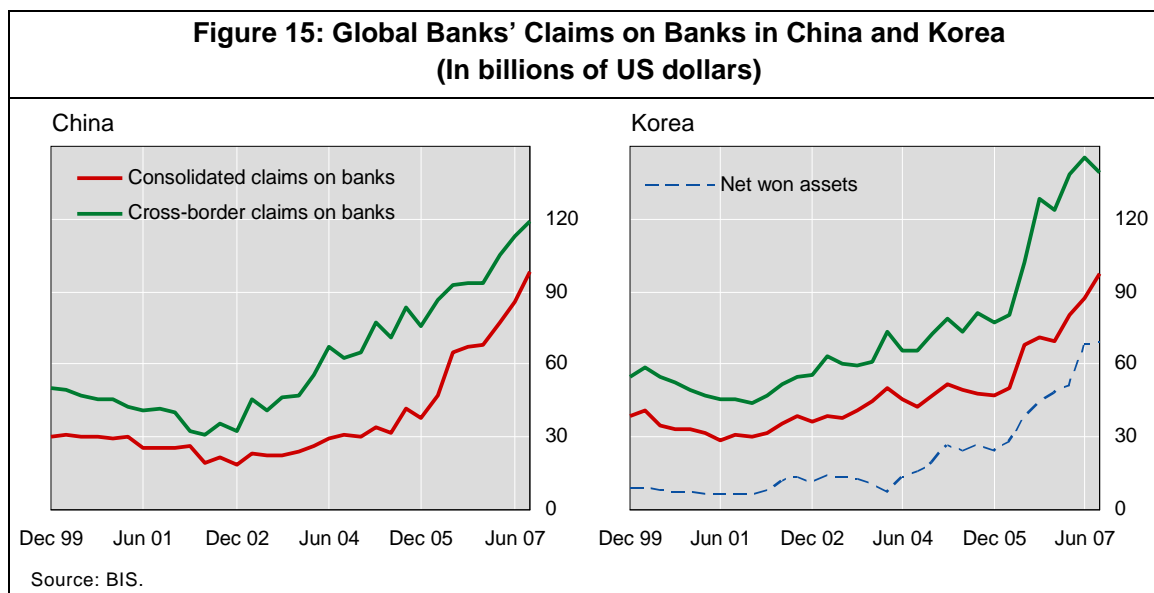
### ***Restrictions on borrowing of dollars by foreign bank branches in China***

In response to the turn in the bank flows, the Chinese authorities extended to foreign banks the long-standing restrictions on the ability of domestic banks to borrow dollars abroad to fund dollar assets in China.<sup>11</sup> This measure has subsequently been reinforced by the requirement that banks meet an increase in bank reserve requirements with US dollar deposits with the central bank.

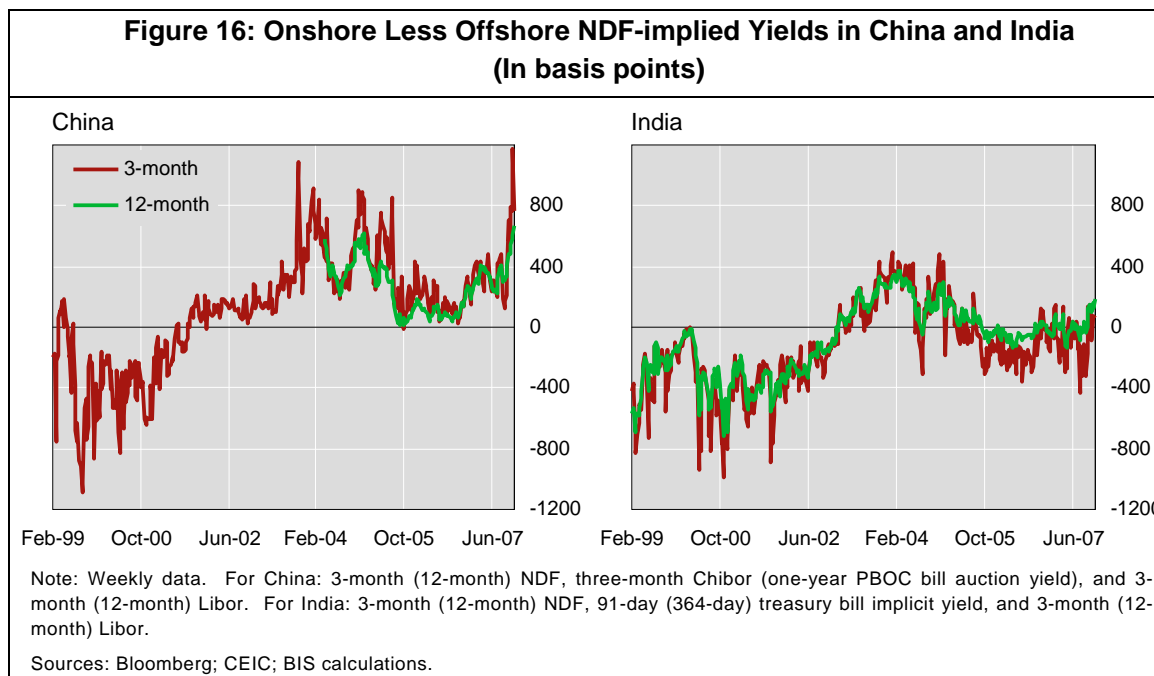
BIS international banking data suggest that inflows into banks in China levelled off for a half a year in response to the measures (Figure 15, left panel). Whether the inflows would have continued to accelerate in the absence of the measures is hard to say.

<sup>10</sup> The Bank of Korea and the FSS (2008, p. 2) report US\$13.5 billion in forward sales by investment funds compared to US\$60.4 billion of forward sales by shipbuilders.

<sup>11</sup> Yu (2008, p. 23) refers to “the ‘extra-national treatment’ [‘super-national’?] given to foreign banks, which allowed them to borrow abroad with fewer restrictions than domestic banks.”



Notwithstanding the resumption of the growth of claims on banks in China, the restrictions appear effective: US dollar interbank rates there exceed those offshore (even in the strained international interbank environment of late 2007, see Green (2007)). And, along with all the other restrictions, limits on banks' ability to bring dollars into China have allowed interest rates implied by offshore forward transactions in the renminbi-dollar exchange rate to fall far below onshore rates of like maturity (Figure 16, left panel).<sup>12</sup>



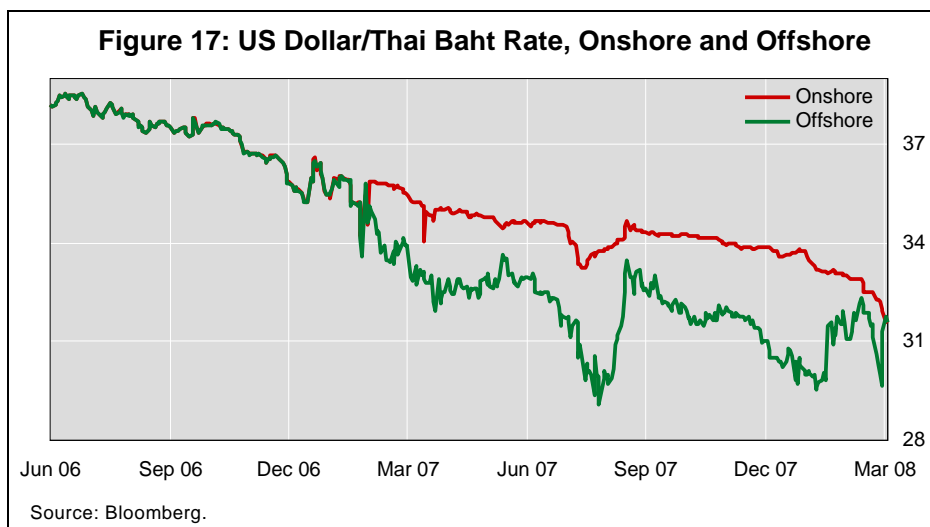
<sup>12</sup> On the non-deliverable forward markets, see Ma et al. (2004) and Ho et al. (2005). For more on the comparison of capital account management in China and India, see Ma and McCauley (2008).

**Unremunerated reserve requirements on fixed income flows into Thailand**

In response to a build-up in non-resident holding of baht bank accounts, in September 2003 the limits on lending baht to banks offshore that dated to early 1998 were generalized to limits on banks in Thailand borrowing baht from offshore parties. Market participants subsequently attempted to get around these restrictions on baht inflows by creating baht debt securities and marketing them to non-residents. After several efforts to limit particular forms of securities, the Thai authorities announced the unremunerated reserve requirements against portfolio inflows. The subsequent adverse reaction of the equity market led the authorities to apply the reserve requirements only to fixed income inflows.

The measure led to a sharp slow-down in fixed-income portfolio flows as captured in the Thai balance of payments. "Other loans," which had shown an inflow of US\$2.9 billion in 2006, reversed to show a net outflow of US\$0.5 billion in the first three quarters of 2007. Meanwhile, portfolio equity inflows accelerated from US\$2.4 billion in 2006 to US\$3.6 billion in the first three quarters of 2007.<sup>13</sup>

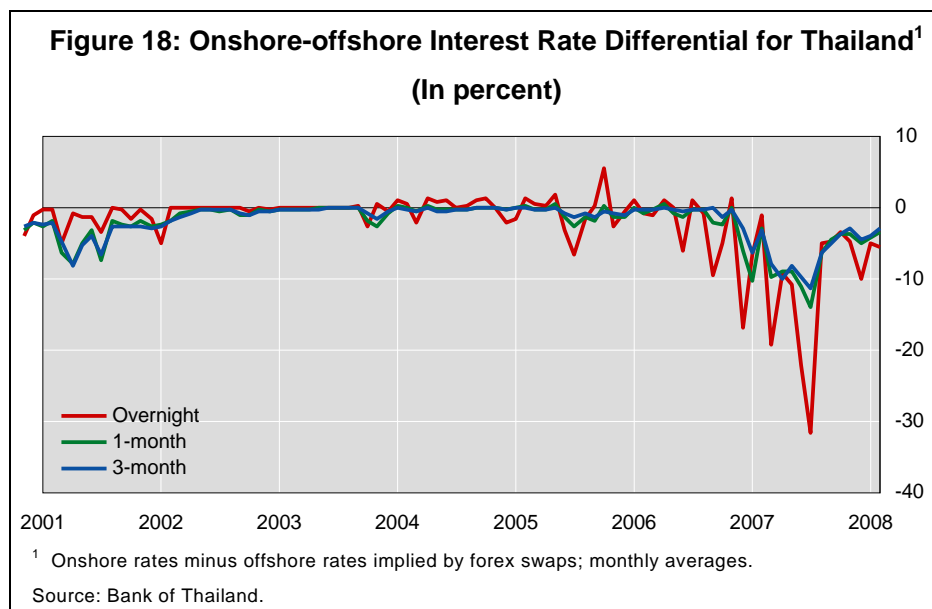
In terms of prices, the effect of the measure was very evident in the gap between the onshore and offshore rate of exchange of the baht against the US dollar. A gap of 2-3 baht (6-9%) pointed unsubtly to the effectiveness of the restriction on non-resident holdings in Thailand. (Indeed, the puzzle is why the gap could be so large, when the cost of the unremunerated reserve requirement would seem to be no more than a third of the interest rate level, or less than 2%.)



The measure led to huge gaps between onshore and offshore interest rates as implied by foreign exchange swaps.<sup>14</sup> The thin offshore market featured higher yields and the absolute value of the gaps hit levels after December 2006 not previously reached in periods of baht weakness into 2002 or periods of baht strength since September 2003.

<sup>13</sup> Net outflows reported by banks in Thailand in 2006-07 must be interpreted with care since the Bank of Thailand has been using forex swaps to sterilize its purchase of dollars. Private banks can end up holding a foreign currency claim on the rest of the world matched against a forward sale of dollars to the central bank, in effect a baht asset.

<sup>14</sup> For an earlier analysis of this onshore-offshore rate differential, see McCauley (2006c).



The Thai authorities removed the unreimbursed reserve requirement as of 3 March 2008, simultaneously taking measures to promote outflows, as described above.<sup>15</sup> As can be seen in Figure 17, the gap between the onshore and offshore exchange rate narrowed in anticipation of the end of the unremunerated reserve requirement and then disappeared at the change in policy. (The interest rate differential shown in Figure 18 remained substantial owing to the use of monthly averages.)

#### ***Restrictions on foreign banks' borrowing dollars from abroad in Korea***

Since April 2007, foreign banks in Korea have been jaw-boned not to respond to strong arbitrage incentives to swap dollars borrowed abroad for Korean won. Moreover, limits on lending in foreign currency to Korean firms, which had been dropped five years ago, were reinstated. Finally, starting in 2008, leverage restrictions originally intended to limit the opportunities for income shifting to offshore affiliates will be reduced, as a further measure to limit bank inflows (albeit only borrowings from affiliates).<sup>16</sup>

In terms of the flow of funds, these measures seemed to slow down foreign banks' funding of their branches in Korea. One can see this in the behavior of the three series plotted in Figure 15, right panel. After the Korean measures in April 2007, international banks' cross-border claims on banks in Korea, including their own affiliates, levelled off in the second and third quarters of 2007. Also, their offshore funding of their won books (the refinance gap dubbed net won assets in Figure 15) has also levelled off.<sup>17</sup> In contrast, consolidated claims on unaffiliated banks in Korea, mostly Korean banks less directly affected by the measures of April 2007, continued to grow.

In price terms, these measures have been remarkably effective.<sup>18</sup> Korean won interest rates implied by foreign exchange forwards and imbedded in cross-currency swaps have fallen to

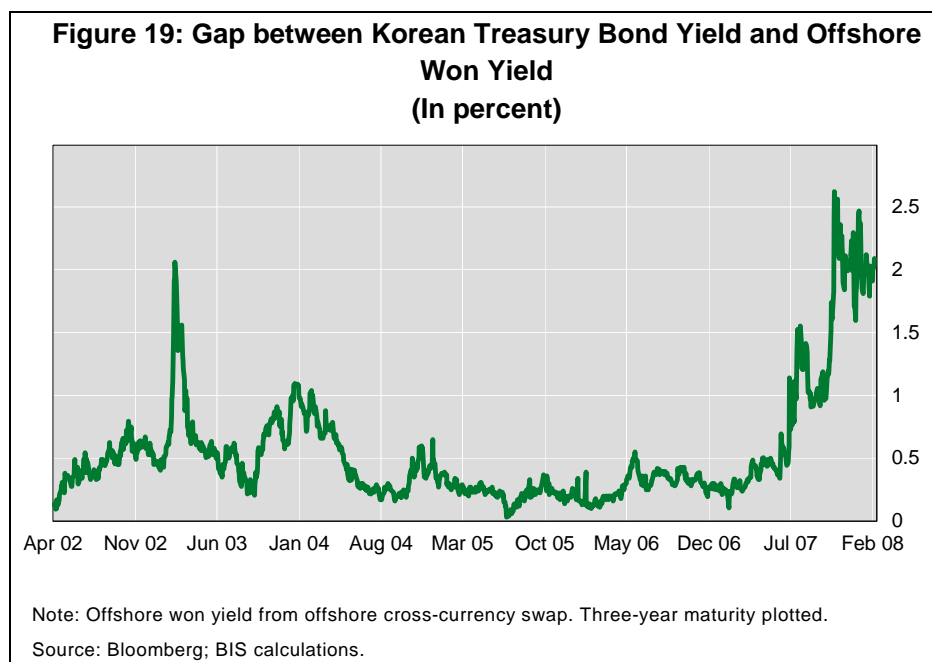
<sup>15</sup> While Wilaipich (2008) titles her piece, "BoT lifts capital controls", she describes how the limits on bank lending to non-residents were lifted from B50 million to B300 million, while limits on bank borrowing from non-residents were reduced from B50 million to B10 million.

<sup>16</sup> See IMF (2007b), Bank of Korea and FSS (2008), Tebbutt et al. (2008) and McCauley and Zukunft (2008).

<sup>17</sup> Note also above in Figure 5, holdings of mostly government bonds by foreign bank branches in Korea levelled off in 2007, consistent with their not adding to positions in which they sell dollars forward, borrow dollars spot, and buy Korean government paper spot.

<sup>18</sup> See Carrillo-Rodriguez and Hohensee (2007).

very low levels relative to the domestic market. Thus, a foreign bank that could borrow US dollars abroad and bring them into Korea can lock in a substantial spread by buying central bank paper or a Korean Treasury bond (Figure 19).



### ***Renewed limits on external commercial borrowing in India***

In India, the limits on external commercial borrowing, which had been very substantially liberalized over the last five years (Jadhav, 2005), were tightened in August 2007. While firms remained able to borrow abroad in foreign currency, their ability to convert the foreign exchange into rupees to finance spending in India was limited to US\$20 million per year, subject to approval (Reserve Bank of India, 2007). This move came toward the end of a half year that saw external commercial borrowing almost double to US\$10.6 billion from US\$5.7 billion.

It is too early to assess the effect of the new measure on the dollar volume of external commercial borrowing. But in terms of prices, since 7 August, the gap between onshore Indian interest rates and the yield implied by non-deliverable forwards traded offshore remained modest—at least by the standards of the similar gap for China (Figure 16).

### ***The debate in Indonesia on policy toward non-resident holdings of SBIs***

In Indonesia, the evidence that non-resident holdings of SBIs are the most flight-prone of such holdings has led to suggestions to ban such holdings. Some proposals cite the purpose or essence of SBIs as monetary control in rationalizing such a ban. Other cite the cost of the carry—the 8% plus cost against the returns of 4-5% on the corresponding reserves assets, and the comfortable position of the reserve holdings. True, taken in isolation, the loss of the US\$3-4 billion of reserves corresponding to non-resident holdings of SBIs would put a modest dent in reserves of over US\$50 billion.

An outright ban on holdings might have the untoward effect, however, of sending the signal that the Indonesian authorities do not welcome foreign capital to a country with large needs for infrastructure spending. Some critics have pointed to the perversity of the SBIs not attracting a withholding tax, while non-resident investment in government bonds does. This



disparity provides a new argument for consolidating the stock of SBIs into government debt (McCauley, 2006a). Such a consolidation would put short- and long-term obligations on the same footing with respect to the withholding tax, without a possibly confusing change of the rules.

### VIII. CONCLUSION

Capital is flowing into East Asia through banks and local bond markets as well as through equity markets and through direct investment. Much of portfolio equity flows and measurable carry trades, such as purchases of short-term Indonesian securities, respond to global volatility in a manner that supports their designation as hot money. But it would be a mistake to understate the role of Asian firms' borrowing dollars in order to protect their cash flow against dollar depreciation. Such corporate hedging has played an important part in drawing funds into the region from the international banking system.

Faced with the upward pressure on currencies from the capital inflows, the authorities in Asia have sought to ease up on restrictions on capital outflows. Over the long haul, more liberal policy toward outflows could lead to a better balance between the private and public sectors' holdings of foreign assets. But in the near term, the outlook for further appreciation of the home currency checks the impulse to invest abroad. Korea's success in encouraging outflows deserves further study and may bear lessons for others in the region.

The authorities in the region have resorted to restrictions on capital inflows to a greater extent than is often recognized. The Thai imposition of unreimbursed reserve requirements in late 2006 is often seen as unique and now, with the announcement of their removal in March 2008, short-lived. But it is the burden of this analysis that the authorities in other large Asian economies have extended restrictions on bank inflows (China), used moral suasion and tax policy against bank inflows (Korea), and reinstated restrictions on converting external bank loans into local currency (India). While we are awaiting evidence from India, evidence from the other economies points to the technical effectiveness of such restrictions.

It would be wrong to let these measures obscure the impulse in the region toward "fuller capital account convertibility," as the second Tarapore report was titled (Reserve Bank of India, 2006). Similarly, it would be wrong to ignore the live, albeit conflicted, interest in the internationalization of regional currencies (McCauley, 2006b). But it would also be a mistake not to recognize that, faced with unenviable choices among an appreciation widely seen as potentially damaging, further intervention with its risks of exchange rate valuation losses and restrictions on inflows, authorities have not excluded restrictions on inflows.

Progress in Asia toward fuller capital account convertibility, therefore, has the character of two steps forward, one step back rather than a monotonic process. With US dollar interest rates headed for levels below those in the early 1990s amid ongoing inflation of food and fuel prices, the choices for policymakers in the region are not getting any easier.

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