

Developing the bond market(s) of East Asia: global, regional or national?

Robert N McCauley and Yung-Chul Park¹

The various initiatives to develop Asian bond markets tend to draw on a shared analysis of the Asian crisis of 1997-98. It is generally agreed that the mismatch between foreign currency debt and domestic currency cash flows, on the one hand, and short-term debt and long-term investments, on the other, left Asian firms and banks vulnerable to changing evaluations of creditworthiness and to exchange rate depreciation. More controversial is a related argument, which gained force as East Asia, excluding Japan, moved into a substantial current account surplus after the crisis. Asia is thought to be missing an opportunity if its savings flow into global capital markets only to be reinvested in some measure in the region at higher yields and at the discretion of global investors.² The development of a regional bond market or domestic bond markets is promoted to make financial structures more resilient, to diversify sources of financing and to increase the asset menu for investment in Asia.

Discussion of means to promote bond market development in East Asia can lose clarity owing to the very different images of the desired outcome held by the participants. In particular, some participants envision the creation of a regional market in which borrowers from around the region obtain funding in regional currencies from regional investors. Others envision improvement to the markets in which predominantly domestic borrowers meet predominantly domestic investors. For the sake of completeness and of drawing distinctions as boldly as possible, it is also worthwhile to consider a third image, namely that of globalised financial markets in which East Asian borrowers and investors participate as relatively small players.

This paper first defines terms and proceeds to sketch out these three alternative paths: global, regional and national. It then considers where markets currently stand, recognising that reality cuts across the neat ideal types sketched. Next, policies proposed to develop bond markets are lined up with the different images. Finally, we conclude with our own views on the preferred image.

¹ The authors are grateful to Clifford Dammers, Guorong Jiang, Malcolm Knight, Francis Lau, Bob Rankin and Philip Wooldridge for drawing various points to our attention and to Christian Dembierment, Denis Pêtre and Swapan-Kumar Pradhan for statistical assistance. Any errors remain those of the authors. Views expressed are those of the authors and not the Bank for International Settlements.

² This is not the place to analyse these widely shared presumptions in depth. Suffice it to say that Korea's sizeable bond market before the crisis did not prevent a crisis. Moreover, it is not clear, at least at the aggregate level, that Korea suffered a currency mismatch problem. Bond market development can only keep East Asian savings in East Asia on a *net* basis if it increases domestic investment or consumption, leading to higher absorption and narrow current account surpluses. Gross flows are another matter. For development of the currency mismatch question, the prospects for narrower current accounts and two-way capital flows, respectively, see Cho and McCauley (2003), Park (2004) and McCauley (2003a).

1. Defining terms

Asian bonds are defined by residence of issuer. They are interest bearing obligations of Asian governments, financial institutions or corporations, wherever marketed and in whatever currency of denomination.

Bond markets can be classified according to residence of issuer, targeted investors and currency of denomination. For instance, the BIS international securities data cover everything but issues by residents targeted at resident investors denominated in domestic currency (Table 1). Issues by non-residents targeted at resident investors and denominated in domestic currency are part of the foreign bond markets, which go by various colourful names (yankee for United States; samurai for Japan; bulldog for the United Kingdom). Offshore (or “euro” in the old sense) markets involve targeting investors with bonds not denominated in their domestic currency.

Table 1
Classification of BIS securities statistics

| | Issues by residents | Issues by non-residents |
|------------------------------------|--|---|
| In domestic currency | | |
| Targeted at resident investors | Domestic | International (foreign: yankee, samurai, bulldog) |
| Targeted at non-resident investors | International (offshore or euromarket) | International (offshore or euromarket) |
| In foreign currency | International | International |

Source: BIS (2003a), p 14.

Our approach to defining global, regional and national or domestic markets relies primarily on the “who’s who” of issuers and investors and to a lesser extent on currency of denomination. Thus, global markets require broad international participation on the sell and the buy side, but can, conceptually at least, operate in as few as one or as many as all of the world’s currencies. A regional bond market would be defined primarily as one that brings together issuers and investors from a region, and secondarily as one that uses the currencies of the region. Finally, domestic bond markets feature mostly domestic issuers and investors, although foreign investors may play a more or less important role, while the currency of choice is the local currency.

We fine-tune our definitions of global, regional and national or domestic markets to East Asia and play down the distinction between onshore and offshore markets. Global bond markets would mostly feature dollar or euro bonds underwritten in London, placed in Asia and Europe and housed in Euroclear or Clearstream, as well as truly global bonds, which are also SEC-registered, offered simultaneously offshore and in the United States and housed in both the offshore depositories and the US Depository Trust Company.³ Yen issues by Asian borrowers are taken to be examples of regional bonds whether they are legally sold offshore (relative to Japan) as euroyen bonds, onshore as samurai bonds or onshore as private placements. Issues by Asian borrowers non-resident in Hong Kong SAR or Singapore denominated in Hong Kong or Singapore dollars (foreign bonds rather than offshore bonds) are also termed regional bonds. It should be clear, therefore, that we consider that there are potentially several regional bond markets in East Asia. Further, one can imagine domestic regulations or withholding taxes

³ As well as the near-global bonds, underwritten offshore and placed in the United States under the SEC Rule 144a.

favouring Thai or Korean borrowers selling Thai baht or Korean won bonds in Tokyo or Hong Kong. Such an offshore market would also count as a regional bond market, owing to issuers and investors sharing East Asian residence and the use of a regional currency.

2. Global bond markets

East Asian issuers and investors could integrate themselves into global bond markets. Global markets require cosmopolitan participation of issuers and investors, but could function with one or many currencies. At one extreme, global markets might operate with only one currency, or only with major currencies like dollar, euro and yen. At the other extreme, global markets might be very accepting of different currencies.

Global bond market integration with few currencies

The extreme of one or few currencies would maximise the liquidity of bonds issued by East Asian issuers and the liquidity of bonds bought by East Asian investors. With well developed derivatives markets, issuers could swap the proceeds of their bond issues back into domestic currencies; similarly, investors could contract asset swaps to transform bonds denominated in major currencies into domestic currency assets.

The example of Canada is more to the point than that of any emerging market. When the issuers from an emerging market borrow in major currencies, the presumption is often made that they have no choice. That is, it is assumed that international investors, and perhaps domestic investors as well, will not buy bonds denominated in the home currency. Controversy attaches to whether this is a result, as it were, of natal curse (“original sin”) or is rather the reaction of investors to a history of variable inflation and less subtle violations of creditors’ rights. With Canada, by contrast, there is obviously a choice, although that choice has increasingly favoured the greenback rather than the loony.

Canadian corporations’ bond issues show an evolution to this first version of globalised markets. In the mid-1970s, Canadian firms denominated 80% of their bonds in the home currency. This proportion declined over the next 10 years, but recovered as Canadian firms sold Canadian dollar bonds in the eurobond market (moving from the domestic bond market to the global bond market in the second sense). This offshore demand for Canadian dollar bonds was associated with the higher interest rates on Canadian dollar bonds than on US dollar bonds at the time. As Canadian interest rates converged to US interest rate levels in the 1990s, the offshore demand dropped off and the Canadian dollar share started to fall again. By 2001, Canadian firms used the US dollar as much as the Canadian dollar to denominate their bonds.

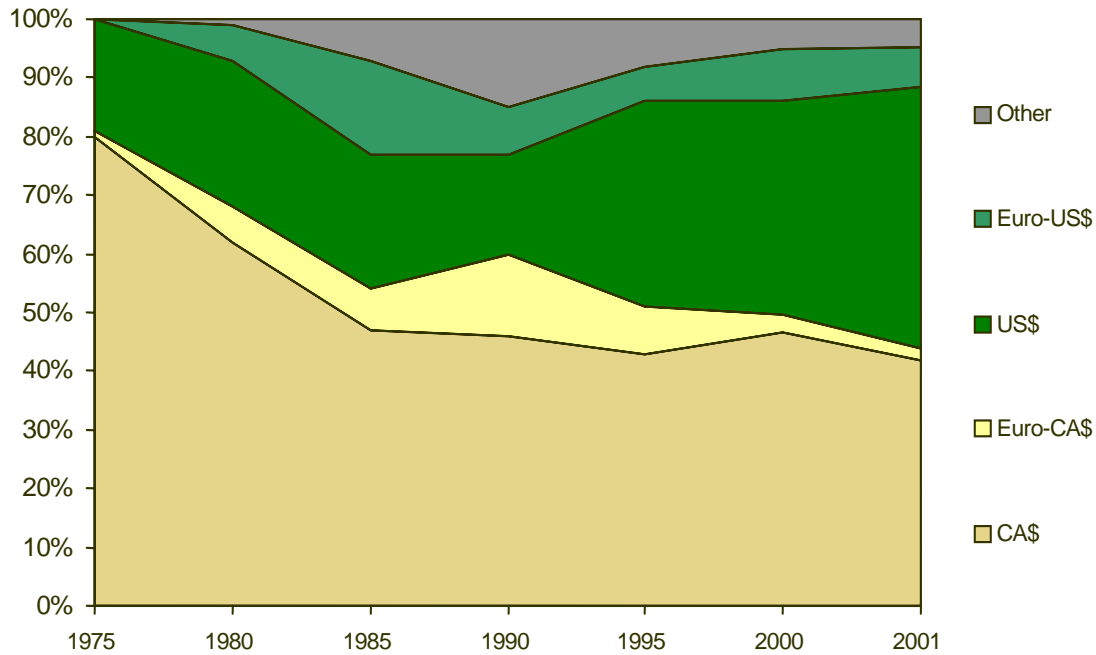
It might be thought that the Canadian corporate sector’s use of the US dollar to denominate its bonds merely reflects the general level of the Canadian economy’s integration with the US economy, and thus the general use of the US dollar by Canadian households and firms. It is important to recognise, however, that the predominant role of the US dollar in the bond market *stands out as an exception* (Murray and Powell (2002)). Canadian holdings of dollars amount to no more than 10% of Canadian holdings of cash or money, and no more than 20% of bank loans or institutional portfolios. Canadian companies denominate their bonds, but not their bank loans, in US dollars because that way their bonds can find a wider market and thus fetch higher prices. To some extent, this wider market depends on differences on the buy and sell side in the readiness to use the derivatives markets. Thus, some managers of US dollar portfolios are not prepared to swap Canadian dollars into US dollars,⁴ while the large Canadian

⁴ In the bank loan market, the major investors, namely banks, are in the swap business, while the smaller firms that rely on bank loans are less ready to manage a swap book.

firms that sell US dollar bonds could all be presumed to be prepared to swap out of the US dollar liabilities into Canadian dollar liabilities to achieve a desired currency mix of liabilities. In addition, the tilt towards the US dollar bond market by Canadian firms would enable their bonds to gain value from the greater depth, breadth and liquidity of US dollar markets, including the superior interest rate hedging and dealer financing capacities in the US dollar.

Graph 1

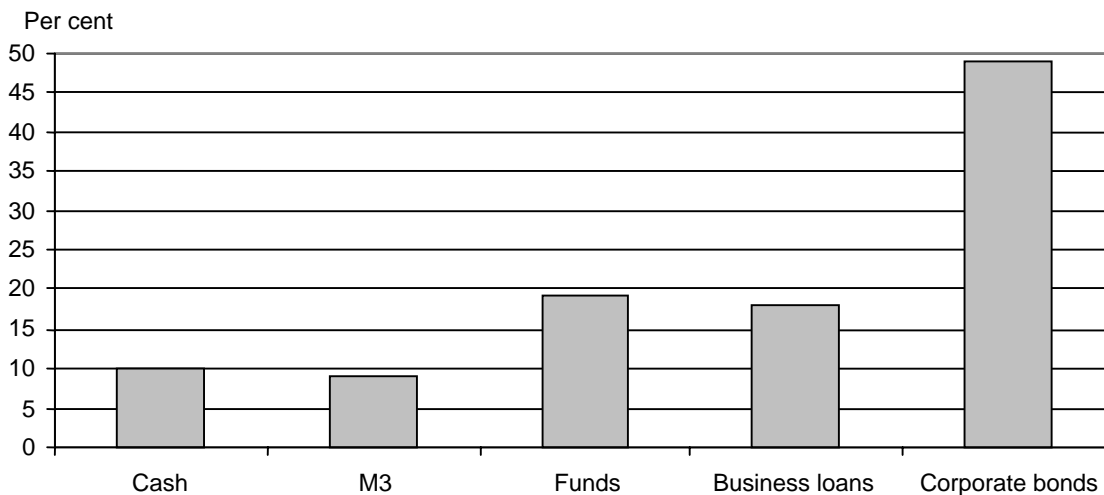
Currency denomination of bonds issued by Canadian corporations



Source: Bank of Canada.

Graph 2

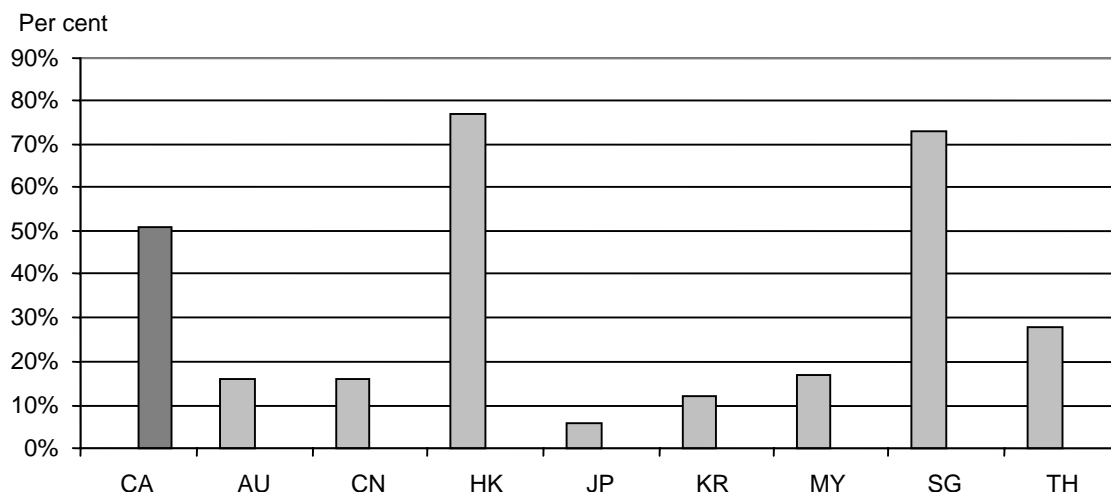
US dollar share of Canadian assets/liabilities



Source: Murray and Powell (2002).

The Canadian corporate sector's integration into the global dollar bond market is matched in East Asia by firms in Hong Kong and Singapore. In part, this reflects the importance of multinational firms headquartered in the two city economies, such as Hutchison Whampoa, which in 2003 built up a single dollar bond to the size of \$4 billion. Relying on a different source of data, Fernandez and Klassen (2004) find that Philippine firms denominate the bulk of their bonds in the dollar.

Graph 3
International share of corporate debt securities



Source: *BIS Quarterly Review*, Tables 12C and 16B, data for September 2003.

One can see aspects of this global vision at work in the market for East Asian dollar bonds. Thus it is widely thought that one of the largest holders of the Republic of Korea's 2013 dollar bond is an insurance company connected to one of the largest chaebol in Korea. It is thought to have bought the dollar paper and to have swapped the dollar cash flows for Korean won cash flows, thereby matching its liabilities to its policyholders.

Proponents of the global image of bond market development for East Asia would readily acknowledge that cross-currency hedging markets need to develop further. Only then could it be assumed that firms can sell dollar bonds and hedge into domestic currency liabilities, and institutional investors can buy dollar bonds and hedge into domestic currency assets. In the face of capital controls, non-resident equity investors and multinational firms have contributed to the development of non-deliverable forward foreign exchange markets in the region (Ma et al (2004)). More to the point are the longer-term cross-currency swap markets, which allow the hedging of whole streams of cash flows stretching over years. These tend to have been small at the time of the last comprehensive measurement, in April 2001, although they have generally grown since (Table 2).

Table 2
Cross-currency swap markets: daily turnover in millions of US dollars

| | AU | CN | HK | IN | ID | JP | KR | MY | NZ | PH | SG | TW | TH | CA | EU |
|------|-----|----|-------|---------|----|-------|-----|----|-----|------------|------------|-------|-------|-----|-------|
| 2001 | 510 | 0 | 285 | 1 | 13 | 1,969 | 46 | 0 | 101 | 2 | 18 | 21 | 11 | 361 | 2,190 |
| 2003 | na | 0 | 30-50 | 250-300 | 0 | na | 100 | 0 | na | "Volatile" | "Volatile" | 20-30 | 15-20 | na | na |

Sources: Hohensee and Lee (2006) for 2003; BIS (2002), pp 78-81 for 2001.

Global bond market integration with many currencies

There is another, more inclusive image of global bond markets. Instead of a duopoly or oligopoly of currencies, the international bond market can be conceived of as an open competition among currencies. Currencies from East Asia and the Pacific could be, and to some extent are, integrated into this global bond marketplace. The euro has surpassed the dollar in this market and, taken together, the two currencies represent about 85% of outstanding international bonds - close to a duopoly in practice (Graph 4). Sterling represents the next biggest currency sector, with 7% of outstanding bonds. Taken together, currencies of East Asia and the Pacific (broken out on the right-hand side) amount to \$650 billion in international bonds, about 6% of the total of over \$11 trillion. Of these, the Japanese yen represents the largest part (about three quarters of the regional total), with 4% of outstanding international bonds. The Australian dollar, Hong Kong dollar, Singapore dollar and New Zealand dollar bonds follow. There is a small New Taiwan dollar segment as well, while a few equity-linked capital issues for Thai banks were denominated in Thai baht and sold to international investors. All in all, five or six of the EMEAP economies have a presence in the international bond market.

The international bond markets have shown a willingness to accept peripheral or “exotic” currencies, especially when these offer higher yields to compensate for lack of familiarity, greater perceived exchange rate risk and often lower liquidity. Thus, higher coupon payments have characterised the so-called dollar bloc currencies (the Canadian, Australian and New Zealand dollars) when these have sold well. The process of monetary unification in Europe led to “convergence plays” on the Finnish markka, Irish pound, Portuguese escudo, Spanish peseta, Italian lira and, most recently, the Greek drachma. This same thinking now warms investors to Polish zloty and Czech koruna bonds (Table 3). In contrast, investors interested in Hungarian forint bonds have had to enter the domestic market and buy government bonds.

Table 3

Minor currency bonds outstanding in the international bond market, end-2003

Billions of US dollars

| | | | |
|------------------|------|--------------------|-----|
| Argentine peso | 0.9 | Singapore dollar | 9.4 |
| Czech koruna | 8.0 | South African rand | 9.3 |
| Hong Kong dollar | 45.6 | New Taiwan dollar | 4.0 |
| Polish zloty | 5.2 | Thai baht | 1.7 |

Source: BIS.

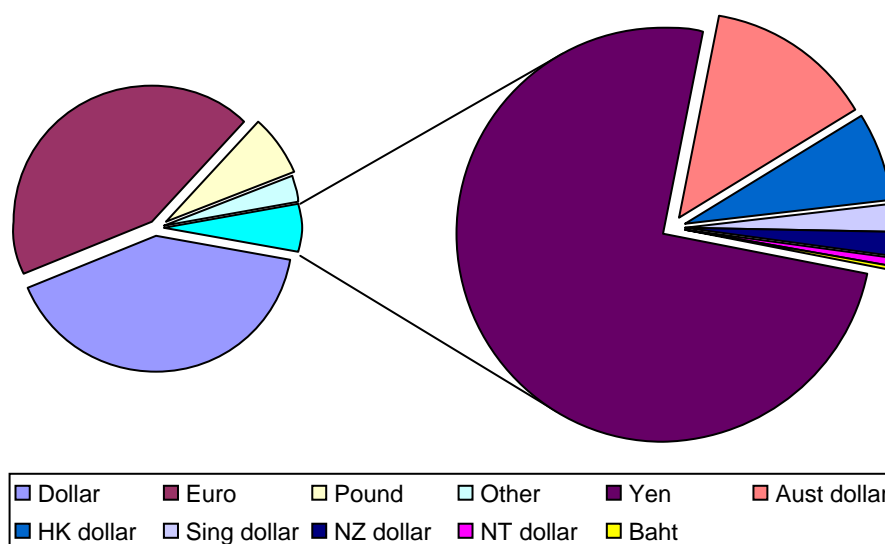
Outside Europe, foreign investors have had their choice between buying South African rand bonds in the international bond market and buying the government bonds in the domestic market. Chile and Mexico have not allowed their bonds denominated in their respective pesos to be sold in international markets.

A common element in the dollar bloc, peripheral European and other issues is a higher coupon than that available on bonds denominated in major currencies. One could argue, in fact, that, although all of the currency sectors listed in Table 3 satisfy the BIS definition of international bonds, the relatively low-coupon Hong Kong dollar, Singapore dollar and New Taiwan dollar bonds have not been widely marketed outside the three economies. If wider demand in the international bond market does indeed depend on attractive coupons, then the higher-coupon, moderate-inflation currencies of East Asia may have the best shot at international portfolios. In particular, the Korean won, Philippine peso and Indonesian rupiah

in East Asia, and Indian rupee bonds in South Asia, could meet with the greatest demand. The acceptance of such bonds to investors in global offshore markets has not been tested to date owing to the unwillingness of domestic authorities to permit them.

Graph 4

Currency composition of the international bond market



3. Regional bond market

In a regional bond market, governments, banks and companies in the region would tap institutional investors, banks, mutual funds and individuals in the region. There is a strong feeling in East Asia that the region has never achieved what Europe had before the euro. As Donald Tsang, Hong Kong's then Financial Secretary, asked rhetorically, "How is that we in Asia have never been able to replicate the eurobond market success in this part of the world?" (Tsang (1998)). We interpret the reference to have been to European issuers' selling bonds denominated in European currencies largely to European buyers. This section first gives an example of an East Asian issuer tapping regional portfolios in a regional currency. Then the truth of Tsang's observation is demonstrated in terms of currency sectors. This section then considers whether there are important regional elements in the international dollar bond market and, more narrowly, in the international market for Australian dollar bonds.

KAL bond issue

An example of an Asian firm tapping a regional bond market is provided by the Korean Air Lines issue in 2003. Given Korea's proximity to Japan and the flow of tourists from Japan to Korea, Korean Air has a regular flow of yen receipts from travel agents in Japan. By pooling these cash flows, and adding a credit enhancement from the Korea Development Bank, a yen-denominated bond could be issued that met the quality demands of Japanese investors.

Regional issuers in regional currencies: Europe versus Asia

It is well known that the introduction of the euro has helped to encourage European issuance in the new currency, and led to rapid growth of the euro bond market. Part of this growth has been in the international bond segment, and has led the euro sector to overtake the dollar sector (Graph 4 above). The relevance of all these observations for East Asia is at best distant, since few foresee the introduction of a common currency in East Asia for a generation.

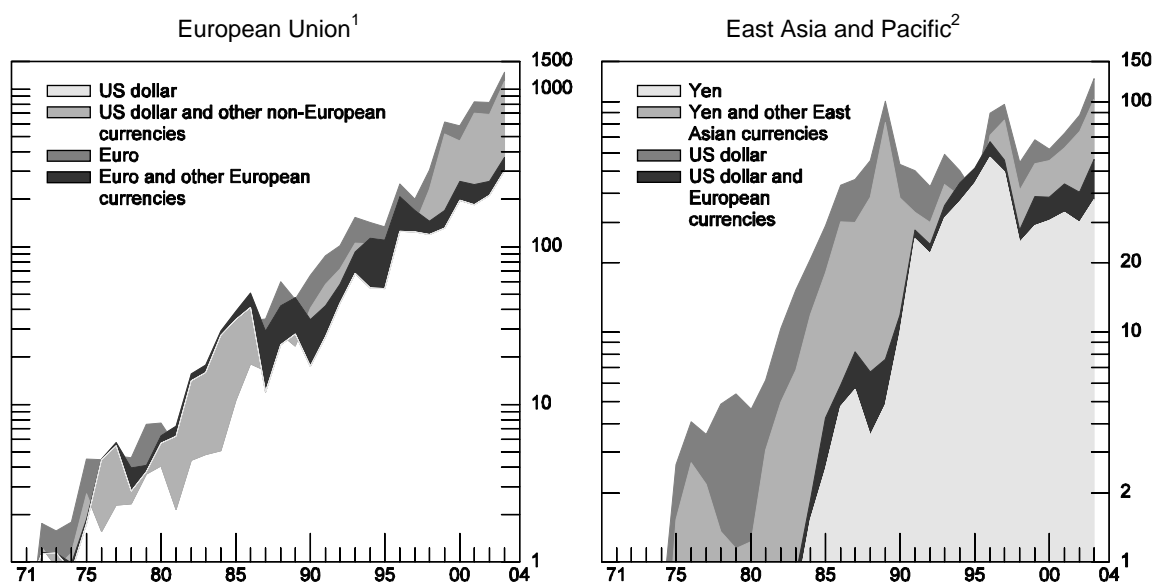
Of greater relevance is the record of the international bond market before the introduction of the euro. Scrolling back 10 years, what role did the Deutsche mark, its surrogates (like the Dutch guilder, Danish krone or ECU), and its immediate competitors like the French franc and others, play in the meeting the international financing needs of European governments, banks and corporations?

Looking at the left-hand panel of Graph 5, it is clear that the euro's predecessor currencies played a predominant role in the international bond offerings of European (defined here as current EU) borrowers. To be sure, dollar issues figure importantly, but since at least five years before the euro, its predecessor currencies have accounted for more issuance than the dollar. The regional element is even larger when the share of sterling bonds is taken into account.

The right-hand panel tells a very different story. Issuance by East Asian governments, banks and corporations in the international bond market is overwhelmingly dollar-denominated. Regulation, buy-side characteristics and exchange rate management have all played roles in preventing Asia's currencies from posing tougher competition to the dollar.

To begin with, the authorities in important Asian countries have not been prepared to accept non-resident issues targeted at resident investors or offshore issues in their currencies. In the case of Singapore, foreign issuers have been allowed to sell Singapore dollar bonds, but only to swap the proceeds into foreign currency. Thus, a multinational company with operations in Indonesia, the Philippines and Thailand that found the Singapore dollar an attractive currency to borrow in, both because of its movement with regional currencies and because of the low interest rate, might be able to access the Singapore dollar bond market, but not hold liabilities in the Singapore dollar at the end of the day. Regulation in the form of Japanese-language registration requirements has also made especially opportunistic issuance in the yen difficult.

Graph 5
Announced international bonds and notes issuance by nationality and currency
 In billions of US dollars
 (semi-logarithmic scales)



¹ European Union refers to the current membership. Euro is the euro or its predecessor currencies. ² Comprises Australia, China, Hong Kong SAR, India, Indonesia, Japan, Korea, Malaysia, New Zealand, the Philippines, Singapore, Taiwan (China) and Thailand.

Sources: Dealogic; Euroclear; ISMA; Thomson Financial Securities Data; BIS.

Nishi and Vergus (2004) emphasise the risk appetite of Japanese investors, and this factor, unlike regulation which has only eased over time, can explain why East Asian issuance in yen has not regained the levels reached before the Asian crisis (while that in the dollar has). Japanese investors are increasingly prepared to run currency risk, otherwise there would not be such an active market for Australian dollar paper there. When it comes to credit risk, however, Japanese investors' own recent domestic financial history has not well prepared them to accept it. Moreover, they feel burned by their experience with domestic high-yield issuers like Mycal and more so with foreign high-yield, high-risk issuers like Argentina. Thus, while a below investment grade issuer like the Republic of the Philippines, or even investment grade Federation of Malaysia, have tapped the dollar and euro segments of the international bond market, they have not sold much in the way of yen bonds. The yen bond market is also limited by the risk appetites of Japanese institutional investors. With rare exceptions like the leasing group Orix, Japanese institutional investors, like Japanese households, have been more willing to take on currency risk than credit risk in external investments. To be fair, as argued by Remolona and Schrijvers (2003), starting with a low-risk portfolio, yield enhancement through acceptance of credit risk is inherently a trickier proposition than yield enhancement through acceptance of foreign exchange risk. Because of the fat left tail of the distribution of returns on risky bonds, diversification requires very broad portfolios (which are particularly hard for a bond-picking household to assemble).

Exchange rate management may also play a role in the limited development of an Asian regional bond market. Regional currencies have tracked the yen only to a limited extent, at least until recently. This means that from the perspective of issuers worried about the possibility of their liabilities blowing up, selling yen bonds may have posed greater exchange rate risk than selling dollar bonds. The contrast with Europe would be that after the onset of generalised floating in 1973, a number of European currencies shared much of the Deutsche mark's movements against the dollar, thereby reducing the risk of governments' and corporations' mark borrowing. Nevertheless, Schmidt (2004) has argued that the yen markets have missed an opportunity in recent years insofar as regional currencies, especially the Korean won, have shared much of the yen's movements against the dollar.

Exchange rate management also bears on the attractiveness of the Hong Kong dollar as a currency to denominate bonds. Typically, there is a premium of long-term Hong Kong dollar yields over US dollar yields, in part reflecting currency risk and in part reflecting liquidity. To pay more for a Hong Kong dollar bond than a US dollar bond thus requires a view on the Hong Kong dollar. Thus, most international issuance of Hong Kong dollar bonds has been either opportunistic (that is, driven by profitable opportunities to swap the proceeds) or for funding assets in Hong Kong.

Regional elements in international bond markets

There may be important regional elements in the global bond markets as they concern East Asia and the Pacific.⁵ One regional element in the international bond market is the placement of international Australian dollar bonds in Japan among retail investors. Another, broader regional element may be a regional bias in the investor base for US dollar bonds sold by East Asian borrowers.

⁵ Above, it was argued that the Canadian corporate sector had integrated its bonds into global capital markets, progressively eschewing the Canadian dollar in favour of issuing bonds into the broader, deeper and more liquid US dollar market. This was taken to be a case of embracing the global bond market. From another perspective, this is a case of regionalism in bond markets, since many US buy-side investors' portfolio guidelines or restrictions would treat Canadian issuers the same as US issuers. What is on one view a strong case of globalisation, might therefore on another view seem to be a case of regionalism within global markets.

Uridashi market

As explained in the paper in this conference by Nishi and Vergus (2004), Japanese securities houses market Australian dollar bonds formally issued as international bonds to Japanese households. Since the household buyers are averse to credit risk, if not currency risk, the issuers of the bonds are mostly very high-quality governments or agencies from outside Australia. They are opportunistic issuers looking only for cheap funding when measured against US dollar Libor or Euribor. Through the swap market, their liabilities ultimately are taken on by Australian banks or firms financing assets in Australia. While complicated, the essence of the transactions is the willingness of Japanese households to take on the currency risk of the Australian dollar in exchange for a decent coupon. And what is clear is that these bonds require an ongoing investment in providing information to Japanese households by the Japanese securities firms.

Is it possible to imagine this same marketing being applied to the sale of, say, Korean won bonds to Japanese households? While Korea does not possess Australia's aura of a vacation and honeymoon destination, it has had another advantage in recent years. As noted above, the won has shared a considerable, albeit varying, part of the yen's movements against the dollar. A Japanese investor in a won bond would have experienced less volatility in the value of their holdings compared to an investment in a US dollar bond. Were such a co-movement to persist it would favour the development of Japanese demand for won bonds. Indeed, the relative stability of the won in terms of yen led Korean companies, reportedly small and medium-sized enterprises with little in the way of yen cash flows, to build up \$7 billion in yen debt from Korean banks in 2002.⁶

A regional bias in investment in US dollar bonds issued by Asian borrowers?

A question has arisen whether Asian buyers figure disproportionately among investors in US dollar bonds issued by East Asian governments and corporations. Market participants have coined the term "Asian bid" to describe this asserted clientele, which is used to explain the spreads of such bonds or their stability (Fernandez and Li (2002), Woods (2002), Schmidt (2004)). McCauley et al (2002) consulted the trade press for reports of the placement of dollar- and euro-denominated bonds of East Asian issuers and reported that almost half were placed in Asia. Eichengreen and Park (2003) question whether there is anything more to the Asian bid than home country investors' buying dollar bonds.

There is agreement that there is home bias. For instance, Korean banks and institutional investors are reported to be important holders of the Republic's and Korean Development Bank's dollar bonds; Philippine banks match their US dollar deposits with the shorter-dated Philippine government dollar bonds; and Chinese banks are reported to be important holders of Chinese dollar bonds.

The question is whether, in addition to home bias, there is substantial regional bias. Eichengreen and Park show that during the period covered by McCauley et al, Japanese holdings of Asian bonds (presumably mostly dollar-denominated) actually fell in dollar amounts. They ask, if not Japanese investors, then who are the Asian investors with a regional taste in bond buying? Moreover, they argue that Asian investors do not plausibly have any informational advantage in buying Asian bonds and that, given the similarity of economic structure and business cycles, Asian investors cannot sensibly diversify by buying Asian dollar bonds.

The issue will not be resolved here. The Box reviews the evidence from the BIS banking data and from the IMF's portfolio capital survey in 2002. Substantial holdings of Asian bonds in

⁶ See Financial Supervisory Service (2002).

Hong Kong or Singapore leave open the question of the ultimate beneficial owner (eg an Indonesian bank branch there holding an Indonesian bond or a French-owned insurer there holding a Korean bond). There remains room for diverging interpretations of the data on cross-border holdings of Asian bonds in Asia.

Regional bond market: a summary

To conclude, although Asia enjoys more than one financial centre featuring the issuance of bonds by non-resident borrowers, the yen, the Hong Kong dollar and the Singapore dollar have not to date attracted a large share of the offshore issuance from the region. Unlike the EU countries in the years before the introduction of the euro, the international dollar market still captures most of the offshore issuance of bonds by regional borrowers.

A variety of factors seem to be responsible for the relatively small role of existing regional bond markets in the international fund-raising of regional borrowers. Regulation used to limit access to the yen market by lower-rated borrowers and still imposes some costs. At this point, however, it is probably the aversion of Japanese investors to credit risk which poses the larger hurdle to regional issuance. Regulation does limit the ability of all foreign issuers to arrange Singapore dollar liabilities, while the currency board system in Hong Kong makes Hong Kong dollar funding generally unattractive to international borrowers.

While there may be important regional currents in the flow of funds in the US and Australian dollar global bond markets, our overall result is that the regional bond markets to date have only offered limited funding options. Thus, we turn to the national markets, without having found a very solid alternative to them in the existing regional markets.

Box

Cross-border holdings of Asian bonds: banks and all investors

Robert N McCauley and Patrick McGuire

While there is broad agreement among policymakers in East Asia that further financial integration in the region would be desirable, no such consensus has emerged regarding the proper understanding of the current extent of such integration. Market-based analysts highlight the importance of the "Asian bid" - that is, a disproportionate representation of regional buyers - in the primary and secondary market for dollar bonds issued by East Asian governments, banks and firms.¹ This view has been challenged, however, by reference to official Japanese data on holdings of bonds by Japanese residents, which suggest low and declining holdings of the obligations of Asian issuers.

This box consults two sources of evidence to shed light on the extent of the regional bias in holdings of international bonds issued by East Asian borrowers. First, the BIS international banking data report banks' cross-border claims that take the form of bonds, providing country detail and a time series perspective. Banks are natural buyers of bonds, especially those of relatively short maturity or those bearing floating interest rates, but represent just one investor segment. Second, the IMF portfolio survey of securities holdings provides broader coverage of the investor base, capturing institutional investors as well as banks, but represents only a snapshot at end-2002. The IMF data are in principle universal, while the BIS reporting area does not include all the important Asian economies.

BIS international banking data

Even as a means to profile a single segment of investor demand, the BIS data are limited by the reporting area, which does not include some important economies in East Asia (BIS (2003b)). In

¹ See Schmidt, 2004.

Box (cont)

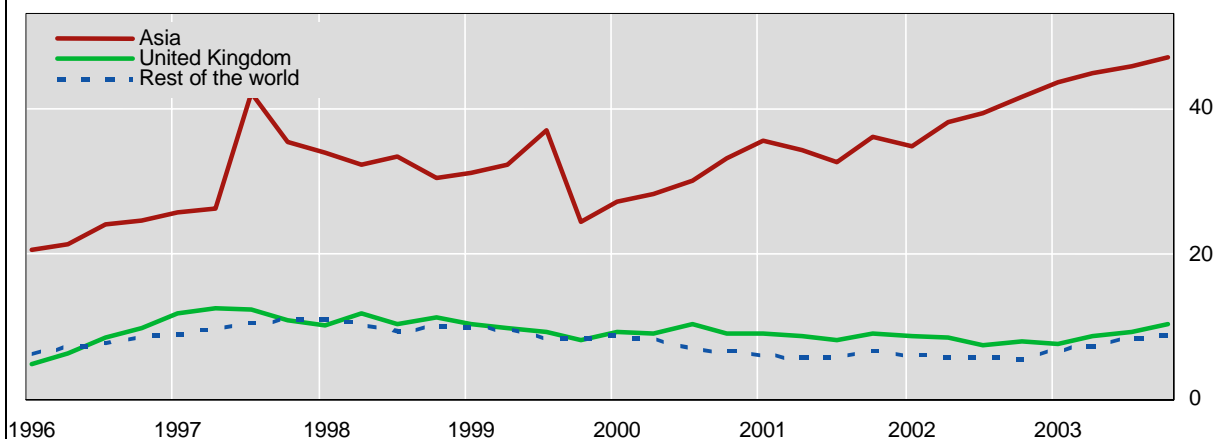
Cross-border holdings of Asian bonds: banks and all investors

particular, while Hong Kong SAR, Japan and Singapore are long-time reporters, Australia and Taiwan (China) have joined only recently. Yet to participate are China, Korea, Malaysia and Thailand. Thus, Asian holdings of Asian bonds as measured by the BIS data will be smaller than the actual amount insofar as banks in these latter countries hold bonds issued by their neighbours. The data include both international bonds and domestic securities held offshore, for instance a Hong Kong bank's holdings of a Korean treasury bond (which are, judging by Korean flow of funds data, very small).²

The BIS banking data do suggest a regional bias in holdings of Asian bonds by Asian banks. This conclusion emerges from two findings. First, as of the fourth quarter of 2003 BIS area banks held an estimated \$66 billion in bonds issued by borrowers from Asia excluding Japan.³ In terms of country composition, the largest holdings are vis-à-vis Singapore and Korea (as suggested by the BIS data on international bonds issued by Asia excluding Japan). Second, an estimated two thirds of these bonds are held in Asia, including Hong Kong, Japan, Singapore and Taiwan (see the graph below). About half the rest are held by banks in the United Kingdom.⁴ Holdings of Asian bonds by reporting banks in Asia were squeezed by the combination of regional banks' loss of access to international interbank markets during the period of the Japan premium and the Asian crisis, but have risen since late 1999.

Estimated holdings of Asian bonds by BIS area banks

In billions of US dollars



IMF portfolio survey

The IMF survey of cross-border portfolio holdings of bonds provides a matrix of holdings for East Asia and allows these holdings to be put into a global context (Bae et al (2006)). It shows holdings of long-term debt securities at the end of 2002 and includes both foreign currency and local currency bonds. These data need to be interpreted with some care because the decomposition by country is often not complete.

² The data also include some holdings of short-term paper, such as certificates of deposit, that are not relevant to the question under discussion.

³ Asia excluding Japan includes Hong Kong, Singapore and Macao, typically classified as offshore centres by the BIS.

⁴ The country composition of Hong Kong banks' bond holdings is estimated using the composition of loans, and bond holdings are estimated for Japan and Singapore from country by country data on non-loan claims.

Box (cont)

Cross-border holdings of Asian bonds: banks and all investors

The data indicate an uneven but in aggregate high degree of regional bias in bond holdings across Asia excluding Japan. Asia excluding Japan holds over half (51.3%) the bonds issued by borrowers in that area (last row of the table). In the first column of the table, for instance, investors in Hong Kong put 12.8% of their international bond portfolio into Asian bonds, and, given the size of their aggregate portfolio, they account for a high share (7%) of international holdings of such bonds. Excluding Japanese bonds, Hong Kong holds 16% of global holdings of Asian bonds. Singapore puts a higher fraction of its overall international bond portfolio in Asian bonds, but, given its portfolio size, accounts for a smaller share (13.9%) of global holdings of Asia excluding Japan's bonds. These portfolio data support the hypothesis of a regional bias.

It turns out that the largest foreign investor in the region, Japan, does not show an Asian bias. While Japan's holdings of Asian bonds amount to more than Hong Kong's or Singapore's holdings (last row of the table), they are very small from the Japanese perspective. Of the grand total of \$7.7 trillion in cross-border bond investment captured by the survey, Asian bonds amount to about \$225 billion (about 3%), of which Japanese bonds account for around two thirds (\$160 billion). Global holdings of bonds from Asia excluding Japan thus amount to approximately 1% of holdings. Japan's holdings of bonds from Asia excluding Japan are also around 1%, which is about par. Despite the scale of the Japanese portfolio and the country's proximity, therefore, Japan has no disproportionate holdings of Asian bonds. In contrast, with double digit percentage weights on Asian bonds, investors in Hong Kong, Indonesia, Korea, Macao (where the currency board vis-à-vis the Hong Kong dollar must play a role), Malaysia and Singapore do favour regional bonds. Given the scale of holdings, the regional bias derives mostly from the behaviour of portfolio managers in Hong Kong and Singapore. The result of a neutral Japanese weight, on the one hand, and regional bias elsewhere in the region, on the other, is the high fractions of internationally held bonds of Asia excluding Japan to be found in Asia (Table A, last column).

Table A
Cross-border investment in bonds, end-2002

In millions of US dollars

| Invested in: | Investment from: | | | | | | | | | Total from Asia | Total in Asia | Asia share ¹ |
|---|------------------|------|-----------|-------|-------|------|-------|--------|-------|-----------------|---------------|-------------------------|
| | HK | ID | JP | KR | MO | MY | PH | SG | TH | | | |
| China | 1,232 | ... | 578 | 38 | 15 | ... | 2 | 416 | – | 2,281 | 3,430 | 67 |
| Hong Kong SAR | ... | 57 | 1,137 | 455 | 521 | 40 | 58 | 1,653 | 20 | 3,941 | 7,208 | 55 |
| India | ... | ... | 159 | 47 | 8 | 1 | ... | 241 | – | 456 | 788 | 58 |
| Indonesia | ... | ... | 49 | 78 | ... | 1 | 4 | 869 | – | 1,001 | 2,462 | 41 |
| Japan | 5,351 | ... | – | 29 | 21 | ... | 5 | 3,828 | – | 9,234 | 159,937 | 6 |
| Korea | 4,202 | ... | 5,348 | ... | 23 | 51 | 15 | 2,586 | – | 12,225 | 25,015 | 49 |
| Macao SAR | ... | ... | – | ... | ... | ... | ... | ... | – | 0 | 1 | 0 |
| Malaysia | 2,085 | 3 | 1,823 | 332 | 3 | ... | 9 | 1,830 | – | 6,085 | 8,844 | 69 |
| Philippines | ... | 5 | 1,389 | 81 | ... | 4 | ... | 595 | – | 2,074 | 7,805 | 27 |
| Singapore | 1,842 | 23 | 680 | 144 | 31 | 41 | 23 | ... | – | 2,784 | 6,451 | 43 |
| Taiwan, China | 674 | ... | 46 | ... | 13 | ... | 7 | 333 | – | 1,073 | 1,372 | 78 |
| Thailand | 447 | ... | 550 | 24 | ... | 1 | ... | 542 | – | 1,564 | 1,895 | 83 |
| Total in Asia | 15,833 | 88 | 11,759 | 1,228 | 635 | 139 | 123 | 12,893 | 20 | 42,718 | 225,208 | 19 |
| Total investment | 123,528 | 703 | 1,135,519 | 9,608 | 2,637 | 471 | 1,553 | 52,830 | 1,344 | 1,328,193 | 7,733,214 | 17 |
| Asia share ¹ | 12.8 | 12.5 | 1.0 | 12.8 | 24.1 | 29.5 | 7.9 | 24.4 | 1.5 | 3.2 | 2.9 | . |
| Share of inv in Asia ¹ | 7.0 | 0.0 | 5.2 | 0.5 | 0.3 | 0.1 | 0.1 | 5.7 | 0.0 | 19.0 | . | . |
| Share of inv in Asia excl JP ¹ | 16.1 | 0.1 | 18.0 | 1.8 | 0.9 | 0.2 | 0.2 | 13.9 | 0.0 | 51.3 | . | . |

¹ In per cent.

Source: IMF.

Box (cont)

Cross-border holdings of Asian bonds: banks and all investors

It can still be asked: who are the beneficial owners of the bonds held in the financial centres of Hong Kong and Singapore? To the extent that they are held at branches of banks headquartered outside the region, one could question whether there really is a regional bias. Whether institutional investors like insurance companies and pension funds would hold bonds in these centres to fund liabilities to retirees and policyholders outside the region is another issue.

Based on the data reviewed, it can be said that a disproportionate share of cross-border holdings of bonds issued by East Asian borrowers is held in bank and institutional portfolios located in East Asia. Whether the ultimate beneficial ownership of these securities, in some sense, is likewise concentrated in Asia remains an open question.

4. National bond markets

A third image for bond market development is the improvement of the working of the existing national bond markets. This image calls for many markets, not one global or regional market, to be developed.

In the wake of the Asian crisis, and given deliberate attempts in places to increase issuance, these markets have reached substantial size, aggregating \$1.2 trillion across East Asia excluding Japan (Jiang and McCauley (2004)). Even if one accepts HSBC's definition of an investable universe of bonds, one still is confronted with an aggregate size of \$270 billion, and this does not (yet) include China and Indonesia. This is considerably larger than the stock of dollar-denominated Asian bonds and even a larger multiple of outstanding yen-denominated Asian bonds. While these markets could no doubt be larger (Eichengreen and Luengnaruemitchai (2004)), the size of the local bond markets alone should give one pause when considering proposals that would ignore the development of national markets in favour of regional markets.

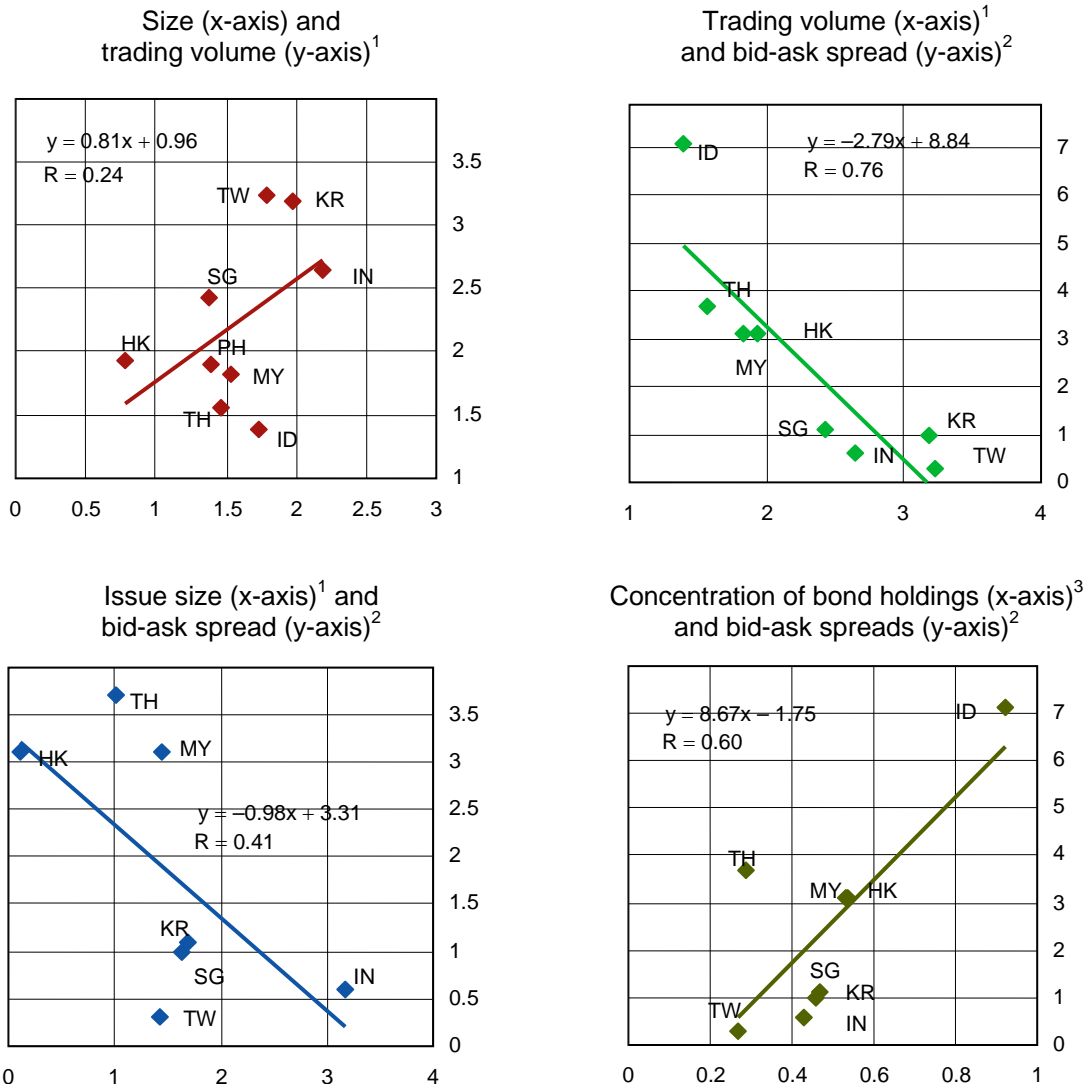
This hesitation only increases when one considers that these national markets suffer to varying degrees from a lack of liquidity and a lack of investor diversity. One finding that holds across G10 government bond markets is that size matters for liquidity (McCauley and Remolona (2000)). That is, the larger the outstanding bonds, the higher the transactions volume and the narrower the bid-ask spread. This result holds across the local economies as well, although it appears to be weaker partly because of the developmental efforts of Hong Kong and Singapore (Graph 6). To be sure, other factors, such as the concentration of issuance in particular issues and the breadth of financing markets, make a difference. The implication of the importance of size for liquidity, however, is that global or regional issuance, particularly by the benchmark issuer, the government, comes at an opportunity cost. Every billion dollars of bonds sold abroad are bonds that will not contribute to the liquidity of the domestic market.

The lack of investor diversity is also related to liquidity. Lack of a diverse investor base tends to make a bond market one-sided, with all the players at times attempting to adjust their portfolios in the same direction. In particular, a predominance of buy-and-hold investors can leave the secondary markets quite inactive. Even if the market has more active accounts, they may, like the Korean investment trust companies or the Thai bond mutual funds, be hit simultaneously with liquidity pressure, leading liquidity to dry up and prices to gap. It appears that a lack of diversity, as measured by the Herfindahl index of the concentration of bond holding, is related to the bid-ask measure of liquidity (Graph 6).

Graph 6

Liquidity in East Asian bond markets

Size, trading, issue size and concentration



¹ In billions of US dollars; in logs. ² In basis points. ³ Herfindahl-Hirschman index.

Sources: Barclays Capital; Bloomberg; Deutsche Bank; HSBC; BIS calculations.

One way of diversifying the investor bases in national bond markets is to open them up to foreign investors, but efforts to develop a regional market could actually hold back such an opening. In Korea, for instance, while about 40% of the equity market is foreign-owned, only 0.4% of the government bond market is foreign-held. Why this is so is not clear: Takeuchi (2004) considers the impediments to foreign investment in national bond markets and McCauley (2004) considers the costs and benefits of doing so. It is sometimes proposed that an easy way to get around these impediments might be to issue bonds offshore in a regional bond market. But this would not really bring foreign investors into the domestic bond market. The next time that investment trust companies or bond mutual funds suffered heavy withdrawals, there would still be no bid from foreign investors who could see a buying opportunity in the temporary liquidity pressure on selected institutions.

5. Images of bond market development and policies

This section considers the mapping between images of bond market development and policies that have been proposed to accelerate bond market development in Asia. Different intentions imply different policies.

Policies for the global bond market

Recall that we sketched out two versions of global bond market development, one with a narrow range of currencies and another with a wide range. Somewhat different policy considerations apply for each.

The first version of global bond market development, which emphasises the network externalities of a currency oligopoly of dollar and euro, would at first blush seem unacceptable to many observers in the region, because it would apparently not respond to a central lesson of the Asian crisis. That is, while reliance on dollar or euro bond funding would perhaps minimise liquidity risks, it would involve firms in the region mismatching projects generating local currency cash flows with debt requiring foreign currency payments. In short, integration into the dollar and euro bond markets might address the maturity mismatch problem but would seem to leave the currency mismatch problem dangerously unaddressed.

Proponents of this version of the global bond market development path might respond, however, that derivatives markets could transform dollar assets and liabilities into local currency exposures. After all, the Canadian example is not really a case of mismatch of currency obligations and receipts. Well developed currency swap markets allow Canadian firms to transform their US dollar obligations back into Canadian dollars. Against this, it might be argued that such hedging markets are developed to varying extents in the region (BIS (2002), Hohensee and Lee (2004)). Those who embrace this image of global bond market development, therefore, would need to consider the means for governments to encourage, or at least allow, the development of cross-currency swaps.

Some would argue that even this global approach needs healthy national bond markets. Recently, the Australian Treasury considered whether to repay all of the Commonwealth's bonds denominated in Australian dollars. As noted above, Australian firms and banks enjoy access to Australian dollar fixed and floating rate finance through the global (and regional) bond market, both directly and through currency swaps. Should the central price discovery mechanism in the Australian dollar bond market, the nexus of cash government bonds, repurchase markets and 10-year futures be allowed to wither? The overwhelming answer during the government's consultation was no. To market participants, it was not clear that the currency and interest rate swap markets could function successfully, in both normal and stressed markets, as the central price discovery mechanism, that is, in the absence of a base of pricing of government bonds. In the end, Australia (2003) decided to retain its domestic government bond market, even if there were no funding need.⁷

Regarding the many-currency version of global bond market development, its implied policy agenda would be regulatory change that would permit the issuance of bonds denominated in Asian currencies in London, New York or Tokyo. As discussed in Eschweiler (2004), this would be quite a programme. Like the first image of global bond market development, this second version, it might be argued, requires national bond market development as a base for the pricing of bonds denominated in local currency, even if they are to be sold abroad.

⁷ See McCauley (2002) for a discussion (now moot) of whether global fixed income markets could function without US Treasury debt.

Policies for a regional bond market

Policies to promote regional bond market development include those on the sell side, those on the buy side and infrastructure. Consider each in turn.

Just as integration of new, Asian currency sectors into the global bond market would require the authorities to permit offshore use of their currencies, so, too, any widening of regional bond markets from the status quo of the yen would require regulatory change. The European experience suggests that the regional development occurred on a wider base than the Deutsche mark alone, over which the German authorities continued to exercise control. Hybrid currencies like the ECU served as ways around that control.

On the buy side as well, a genuinely regional market would require investment from a number of countries. Many large portfolios in the region, national pension or provident funds, for instance, have barely started their external diversification. When they are permitted to diversify externally, the global dollar and euro markets are among the natural first steps. In Thailand recently, the Bank of Thailand has authorised external investment of selected portfolios. In these authorisations, it is reported, some amounts are earmarked for investment in regional bonds. Thus, there are opportunities in the process of opening up fixed income portfolios to external investment for channelling funds into regional markets. Analytically, the question is whether such regional allocations come at the expense of global investment, or are in addition to them, as policymakers accelerate the opening in the pursuit of regional bond market development.

Many observers take three policy initiatives for infrastructure to advance regional bond market development as a package. In particular, they see a regional credit guarantee agency, a regional bond rating facility and a regional clearing and settlement capacity all as pieces of infrastructure needed for regional bond market development (Oh and Park (2006), Park and Rhee (2006)).

From our perspective, the regional credit guarantee agency is less specific to a particular image of bond market development. A regional credit guarantee agency could support the credit of borrowers from the region in accessing global, regional or domestic markets. For example, the Electricity Generating Authority of Thailand obtained World Bank guarantees for the principal and the next interest payment of a 10-year bond (Schmidt (2004, pp 49-50)). The bond was denominated in dollars and sold in the global market. To take another example, the Korean Air Lines deal described above used a Korean Development Bank credit enhancement to access the regional market in Tokyo. To take still another example, the Hong Kong Mortgage Corporation (a wholly owned subsidiary of the Hong Kong Monetary Authority), promotes mortgage securitisation in the territory with guarantees. Substitute a regional credit rating agency for the World Bank, the official Korean guarantor or the Hong Kong Mortgage Corporation, and it is apparent that a regional credit guarantee agency could serve any of the three images of bond market development.

Proposals for a regional rating agency or a regional clearing capacity, by contrast, strike us as specific to the image of regional bond market development. Global rating agencies already exist, and are increasingly targeting domestic bond markets with ratings specific to them (Packer (2003), Kisselev and Packer (2006)). National rating agencies also already exist. Similarly, a regional clearing capacity would sit between the global clearing capacity of Euroclear and Clearstream, on the one hand, and national clearing operations, on the other (Braeckvelt (2006)).

Policies for domestic bond markets

Policies for domestic bond market development in general, or for domestic government bond market development in particular, have been reviewed in a number of forums (APEC (1999), CGFS (1999)).

One aspect of developing domestic bond markets is opening them up to foreign investment. As argued above, foreign investment makes for a more diverse base of investors, even if the inward capital flow is not needed given current balance of payments surpluses in the region. The reason for the low levels of inward investment in local bond markets is not clear, and Takeuchi (2006) surveys market writings to identify the most important impediments to foreign investment.

6. Conclusions

We recommend that emphasis be placed on the third image of bond market development for Asia. That is, national bond markets should be developed with a view to integrating them with global markets at some stage. Even if one embraces the image of a global bond market, development of the national markets would probably be necessary under current circumstances.

The impulse to regional development can contribute to national bond market development by bringing politically acceptable peer pressure to bear. The process of discussing the circumstances under which there could be more regional investment in domestic bond markets may raise the political salience of policy changes that will make domestic bond markets more friendly to foreign investors. The announcement by Thailand of an intended waiver of withholding tax on coupon interest paid to foreigners, which took place at the time of an international conference on Asian bond market development in Bangkok in October 2003, may be a case in point.

One might ask why peer pressure could accomplish what market pressure has failed to do. One answer is that market pressure has not been very strong because underlying balance of payments positions mean that most countries do not need the foreign capital. When countries in the region were running deficits, eg in the pre-crisis period in Thailand, there were a large current account deficit and a real funding need, but no government bonds. Now there are government bonds, but no particular need for additional capital inflows. It might be noted in this connection that the United States repealed its withholding tax on non-resident holdings of bonds only once a large current account deficit opened up in the mid-1980s. Moreover, market pressure is subject to the interpretation that market participants are arguing their narrow interests - to gain access to new revenue sources in domestic bond markets - rather than the national interest. This interpretation of self-interested advice in part reflects the memory of 1997-98. In contrast, peer pressure is less subject to the interpretation that advice to make markets more investor-friendly is self-interested. Finally, peer pressure may be more effective when it is collective.

Care must be taken that measures taken to develop regional bond markets do not slow the development of domestic bond markets: the Korean Air Line deal provides an example of a very sensible regional issue using both securitisation of cash flows and guarantees to meet the high demand for credit quality of the Japanese investor base. A less sensible example would be further duplication of ABF1 - of course, not in the works - which could encourage dollar issuance by borrowers in the region at the expense of domestic market growth. Another untoward example would be the sale of government bonds offshore as part of an effort to develop regional markets. In particular, Kingdom of Thailand baht bonds might be underwritten and sold in Tokyo. As argued above, however, liquidity divided is liquidity lost. Every baht bond not traded in Bangkok would be one less bond that could be repurchased there or that could form part of a benchmark bond there, making the domestic market that much smaller and less liquid. In addition, in political economy terms, the easy option of offshore issuance may militate against removing domestic impediments.

Similarly, care must be taken that infrastructure development for the region proves both consistent with eventual global integration and financially self-sustainable. We have argued

above that a regional credit guarantee agency could serve the goal of domestic bond market development as well as regional bond market development. The ambition to bring small and medium-sized enterprise liabilities to the bond market must be informed by an analysis of losses on such programmes in recent years in Japan, Korea and Hong Kong (Jiang (2004)). Otherwise such an effort cannot be sustained. Similarly, it is easier to extend guarantees to highly leveraged firms not enjoying investment grade ratings than it is to ensure the revolving nature of the guarantees and capital supporting them. The view that Asia is stuck with a mismatch between the credit ratings that investors desire and the credit ratings that its companies are assigned is underpinned by a very partial view of corporate finances. The example of PCCW in Hong Kong, which started as a leveraged buyout of the local telephone company but is now managing its finances to achieve an A rating, reminds us that, within limits, corporate credit ratings are choice variables of corporate management.

Regional initiatives for a rating agency and clearing system are structurally more risky in their dependence on an image of regional bond market development. A regional rating agency will ultimately have to pass the test of being at least a point of reference for investors from outside the region. In other words, its establishment needs to anticipate the integration of bond markets in the region into global markets. By its nature, a regional clearing system must ultimately be hooked up with national systems on one side and global ones like Euroclear and Clearstream on the other.

Since this conference is being held in Korea to mark the hundredth anniversary of Korea University, perhaps we could end with a success criterion for national bond market development for Korea: instead of two orders of magnitude difference between foreign ownership of bonds and stocks in Korea, just one order of magnitude. That is, the Korean bond market might better have 4% foreign ownership than its present level of 0.4%.

References

Asia-Pacific Economic Cooperation (1999): *Compendium of sound practices: guidelines to facilitate the development of domestic bond markets in APEC member economies*, September.

Australia, Commonwealth of (2003): "Statement 7: budget funding", Budget for 2003-03, Canberra, May.

Bae, Kee-Hong, W Bailey and Young-Sup Yun (2006): "Determinants of bond holdings by foreign investors", this volume.

Bank for International Settlements (2002): *Triennial Central Bank Survey: foreign exchange and derivatives market activity in 2001*, March.

——— (2003a): *Guide to the international financial statistics*, *BIS Papers*, no 14, February.

——— (2003b): *Guide to the international banking statistics*, *BIS Papers*, no 16, April.

Braeckevelt, Francis (2006): "Clearing, settlement and depository issues in Asia", this volume.

Cho, Yoon Je and Robert McCauley (2003): "Liberalising the capital account without losing balance: lessons from Korea", in *China's capital account liberalisation: international perspectives*, *BIS Papers*, no 15, April 2003, pp 75-92.

Committee on the Global Financial System of the G-10 Central Banks (1999): "How should we design deep and liquid markets: the case of government securities", CGFS publication, no 13, October.

Eichengreen, Barry and Yung-Chul Park (2003): "Financial liberalization and capital market integration in East Asia".

- Eichengreen, Barry and Pipat Luengnaruemitchai (2006): "Why doesn't Asia have bigger bond markets?", this volume.
- Eschweiler, B (2006): "Bond market regulation and supervision in Asia", this volume.
- Fernandez, David G and Amy Li (2002): "Asian dollar bonds: in a class by themselves", JPMorgan Chase, *Asian Credit Markets Research: Asia Markets Outlook and Strategy*, 19 September, pp 3-6.
- Fernandez, David G and S Klassen (2006): "Choice of currency by Asian issuers", this volume.
- Financial Supervisory Service (2002): "FSC/FSS plans to improve the risk management of foreign currency-denominated bank lending", Financial Supervisory Service, *Weekly Newsletter*, 14 December (www.fss.or.kr).
- Hohensee, M and K Lee (2006): "A survey of hedging markets in Asia", this volume.
- Jiang, Guorong (2006): "Comments on Professor Oh and Mr Park's paper 'ASEAN+3 Regional Guarantee Mechanism'", this volume.
- Jiang, Guorong and Robert N McCauley (2004): "Asian Local Currency Bond Markets", *BIS Quarterly Review*, June, pp 67-79.
- Kisselev, Kate and Frank Packer (2006): "Minding the gap in Asia: foreign and local-currency ratings", this volume.
- Ma, Guonan, Corrinne Ho and Robert N McCauley (2004): "The markets for non-deliverable forwards in Asia", *BIS Quarterly Review*, June, pp 81-94.
- McCauley, Robert N (2002): "International market implications of declining Treasury debt", *Journal of Money, Credit and Banking*, vol 34, no 3, part 2, August, pp 952-66.
- (2003a): "Capital flows in East Asia since the 1997 crisis", *BIS Quarterly Review*, June, pp 45-59.
- (2003b): "Unifying the government bond markets of East Asia", *BIS Quarterly Review*, December, pp 89-98.
- (2004): "Striking the balance: benefits and costs of foreign investment in Asian bond markets", paper presented to Korea Institute of Finance Korea Day seminar, "Financial cooperation in East Asia", Asian Development Bank, Jeju, Korea, 14 May 2004.
- McCauley, Robert N and Eli Remolona (2000): "Size and liquidity of government bond markets", BIS, *International Banking and Financial Market Developments*, November, pp 52-8.
- Murray, J and J Powell (2002): "Dollarization in Canada: the buck stops there", Bank of Canada Technical Report, 90.
- McCauley, Robert N, San-Sau Fung and Blaise Gadanecz (2002): "Integrating the finances of East Asia", *BIS Quarterly Review*, December, pp 83-95.
- Nishi, Fumiaki and Alexander Vergus (2006): "Asian bond issues in Tokyo: history, structure and prospects", this volume.
- Oh, Gyutaeg and Jae Ha Park (2006): "Survey of securitization and credit guarantee proposals", this volume.
- Packer, F (2003): "Mind the gap: domestic versus foreign currency sovereign ratings", *BIS Quarterly Review*, September, pp 55-63.
- Park, Yung-Chul (2004): "The trans-Pacific imbalance: what can be done about it?", processed.

Park, Daekeun and Changyong Rhee (2006): "Building infrastructures for the Asian bond markets: settlement and credit rating", this volume.

Remolona, E and M Schrijvers (2003): "Reaching for yield: tips for reserve managers", *BIS Quarterly Review*, December, pp 65-73.

Schmidt, Florian (2004): *Asia's credit markets: from high yield to high grade*, New York, Wiley.

Takeuchi, Atsushi (2006): "Identifying impediments to cross-border bond investment and issuance in Asian countries", this volume.

Tsang, Donald (1998): Speech to Asian Debt Conference, 6 July, www.info.gov.hk/gia/general/199807/06/0706078.htm.

Woods, J (2002): "Overview: Asian bonds - a class apart?", HSBC Fixed Income Research, August.