



**OFFSHORE MARKETS FOR THE DOMESTIC CURRENCY:  
MONETARY AND FINANCIAL STABILITY ISSUES**

Prepared by

Dong He<sup>1</sup>  
Research Department

and

Robert N. McCauley<sup>1</sup>  
Bank for International Settlements  
(BIS)

**Abstract**

We show in this paper that offshore markets intermediate a large chunk of financial transactions in major reserve currencies such as the US dollar. We argue that, for emerging market economies that are interested to see some international use of their currencies, offshore markets can help to increase the recognition and acceptance of the currency, while still allowing the authorities to retain a measure of control on the pace of capital account liberalisation. The development of offshore markets could pose risks to monetary and financial stability in the home economy, which need to be prudently managed. Experience in dealing with the Euromarkets by the Federal Reserve and other authorities of the major reserve currency economies show that policy options are available for managing such risks.

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Authors' Email Addresses: [dhe@hkma.gov.hk](mailto:dhe@hkma.gov.hk) and [Robert.McCauley@bis.org](mailto:Robert.McCauley@bis.org)

The views and analysis expressed in this paper are those of the authors, and do not necessarily represent the views of the Hong Kong Monetary Authority.

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***Executive Summary:***

- *Offshore markets intermediate a large chunk of financial transactions in major reserve currencies such as the US dollar. This was probably not a historical accident, but reflected the fact that offshore markets play essential economic functions, including a separation of currency risk from country risk and diversification of operational risks associated with the financial infrastructure that provides vital clearing and settlement services for the currency.*
- *For emerging market economies that are interested to see a larger share of their international balance sheets being denominated in their own currencies, offshore markets can help to increase the recognition and acceptance of the currency among exporters, importers and investors outside the economy, while still allowing the authorities to retain a measure of control on the pace of capital account liberalisation.*
- *Drawing on the experience of the major currencies over the period since the inception of the Euromarkets in the 1950s and 1960s, this paper identifies and analyses the challenges posed to monetary and financial stability by offshore markets of domestic currencies. It gives particular attention to the policy measures that were considered or used by policymakers in major-currency economies in their attempts to control such risks.*
- *The paper first considers the interactions of an offshore market with the control of money or credit, with a focus on the credit multiplier and the use of reserve requirements. We conclude that, as long as capital controls are maintained, the authorities can control offshore deposits unilaterally through reserve requirements. In the absence of capital controls, experience suggests that it is possible to impose reserve requirements on banks' net funding in domestic currency from offshore, albeit at the cost of some distortions across firms and banks. Banks not incorporated in the home economy can get around such requirements by funding and booking loans offshore that are extended to domestic firms.*
- *We then consider the issues that arise with regard to offshore investors' influence on the onshore yield curve. Here we emphasise that an offshore domestic currency yield curve has already come into existence on the back of the non-deliverable offshore currency market and that adding offshore deliverability may not represent a large change. We sketch the longer-term implications for the yield curve of offshore activity in a currency, which depend on the impediments to foreign investment in the domestic market, and the relative size of the offshore and onshore markets. If the influence of offshore money markets on the onshore interest rates is significant and warrants a*

*response, it is possible for the home central bank to intervene in the offshore markets through private or public sector agents.*

- *The implications of offshore activities for the exchange rate ultimately depend on how the long and short positions of the currency in offshore markets balance out. In the short term, capital controls may place restrictions on the ability by offshore market participants to take either long or short positions. In the longer term, and under more liberalised capital account regimes, the influence on the exchange rate depends largely on the level of domestic interest rates relative to global levels. Relative low interest rates would tend to make the currency a borrower's currency and its offshore use a net source of downward pressure on its exchange rate. Conversely, relative high interest rates would tend to make the currency an investor's currency and its offshore use a net source of upward pressure on its exchange rate.*
- *Regarding the financial stability lessons for a central bank standing at the very beginning of the process of internationalisation of its currency, we draw the following lessons: first, supervision needs to consolidate risks across currencies, and country risk exposures need to be defined and monitored to prevent undue concentrations in relation to domestic banks' capital. There are also precedents for the consideration of macro-prudential regulation to check the growth of international lending.*
- *Secondly, in the event that the domestic currency becomes very widely used, it might be necessary to have contingency arrangements to provide funding to foreign banks. These arrangements can take the form of operations directly with them, or facilities to provide the funding to partner central banks.*
- *Overall, we conclude that experience in dealing with the Euromarkets by the Federal Reserve and other authorities of the major reserve currency economies show that policy options are available for managing potential risks arising from offshore markets. The lesson to be learnt is that the home authorities need to be alert to such risks, and factor in the additional influence on domestic monetary conditions and financial risks by offshore markets when making monetary and financial policies.*

## 1. INTRODUCTION

The global financial crisis of 2007 - 2009 highlighted a potential benefit of the internationalisation of emerging market currencies. As banks scrambled for liquidity, US dollar funding markets and foreign exchange swap markets seized up in late 2008 (Baba and Packer (2009); Hui et al (2009)). The resulting “dollar shortage” (McGuire and von Peter (2009a, b)) threatened to stifle international trade. In response, more than one emerging market central bank found itself in the unaccustomed business of providing dollar funding to domestic banks and financing exports. This experience has highlighted the danger of relying excessively on one reserve currency in international trade and payments, and the possible benefits of using a wider array of currencies, including emerging market currencies, especially in transactions between emerging markets.

For some emerging market policymakers, the policy responses to the financial crisis in the countries that supply reserve currencies have also raised concerns. Expansion of central bank balance sheets amid fiscal expansion in the world’s major economies has, in some views, placed into question the major currencies’ reliability as stores of value. Whatever the grounds for such concerns, shifting to a situation in which emerging market economies’ claims on the rest of the world are denominated in the domestic currency can offer advantages to the holders of such claims in the official, institutional investor or household sectors. For many fast-growing emerging market economies that are attractive to international investors, their international balance sheets now have large open positions in currencies: their liabilities (e.g., FDI by foreigners) tend to be denominated in domestic currencies while their claims on foreigners (e.g. official reserves) tend to be denominated in major reserve currencies. Allowing non-residents to borrow in the domestic currency would reduce this currency exposure (Cheung et al (2009)).

While keen to reap the benefits of denominating their external claims in their domestic currencies, emerging market policymakers remain leery of the potential risks arising from allowing their currencies to be internationalised. However, risks to monetary and financial stability in the internationalisation of domestic currencies need to be articulated clearly. Drawing on the experience of the major currencies over the period since the inception of the Euromarkets in the 1950s and 1960s, this paper identifies and analyses the challenges posed to monetary and financial stability by offshore markets in domestic currencies. It gives particular attention to the policy measures that were considered or used by policymakers in major-currency economies in their attempts to control such risks.

This paper is written for policymakers in emerging market economies who are contemplating or who have begun to allow their currencies to be used outside their economies. While we pose the questions and set out the main arguments in general terms, we refer to developments in the extra-territorial use of China's currency, the renminbi, owing to the several measures recently taken to allow its use outside of the Mainland. Since 2004, Hong Kong in particular has progressively developed into a renminbi offshore centre, with the scope of its renminbi banking business expanding from personal deposits, to bonds, and to trade credit.<sup>2</sup> This development is of particular analytical and policy interest because it has taken place notwithstanding the Mainland authorities' by and large effectively maintaining control on capital flows (Ma and McCauley (2008a, 2008b, 2009)).

Can authorities promote offshore use of their currencies while maintaining a significant degree of capital account control? Do they have policy options to manage potential risks to monetary and financial stability posed by the offshore markets of their currencies? Our answers to both questions are positive. Thus, this paper argues that full capital account liberalisation is neither necessary nor sufficient for significant offshore use of a currency. To be sure, full internationalisation of a currency may require such liberalisation, but it is less obvious that it is "premature to discuss policies to promote currency internationalisation before it has been decided that restrictions on capital account transactions should be removed" (Gemberg (2009)).<sup>3</sup> After all, it should be recalled that significant controls on capital by the US authorities from the 1960s through the early 1970s (the interest equalisation tax of 1963 and later "voluntary" restraints on capital exports) did not undo the international role of the dollar, and in some ways even gave a boost to the Eurodollar market.

The rest of the paper is organised as follows. In Section 2, we briefly describe the role of offshore markets in the international use of major reserve currencies. Section 3 analyses how the offshore market affects onshore monetary stability, through its influence on the quantity of money and credit, on the yield curve, and on the exchange rate. Section 4 discusses risks of lending in domestic currency by both domestic and foreign banks, and how such risks should be managed through prudential policies. Section 5 concludes.

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<sup>2</sup> The development of renminbi banking in Hong Kong is described in HKMA (2005, 2006, and 2009).

<sup>3</sup> See also Gao and Yu (2009), p 21.

## 2. THE ROLE OF OFFSHORE MARKETS

A useful observation to make at the outset of the discussion is that a significant portion of international use of major reserve currencies, such as the US dollar, takes place offshore. In particular, when non-US residents use the US dollar to settle trade and make investments, they do not transact onshore through banks and in financial markets in the United States. Rather they concentrate their transactions in international financial centres such as the eurodollar market in London. In fact, one may argue that, without the offshore markets, the US dollar would not have attained the dominant position in international trade and payments that it occupies today.

We show that non-US residents reveal a strong preference for doing their dollar business outside of the United States. That is, they tend to deposit US dollars in banks abroad and to buy US dollar bonds issued by non-residents outside the United States (and probably to hold them in European depositories as well).

### 2.1 The global dollar deposit market

The global market for dollar bank accounts shows that home is where the deposits are kept. US residents overwhelmingly favour domestic deposits while depositors in the rest of the world somewhat less strongly favour offshore deposits. In terms of Table 1, the bulk of holdings lies in the northwest-southeast axis.

**Table 1: The US dollar in the global deposit market**  
In billions of US dollars, at end-2008

Non-bank depositor	Location of bank		Total
	United States	Outside the US	
US resident	11,743*	1,520	13,263
Non-US resident	809	2,580	3,389
Total	12,552	4,100	16,652

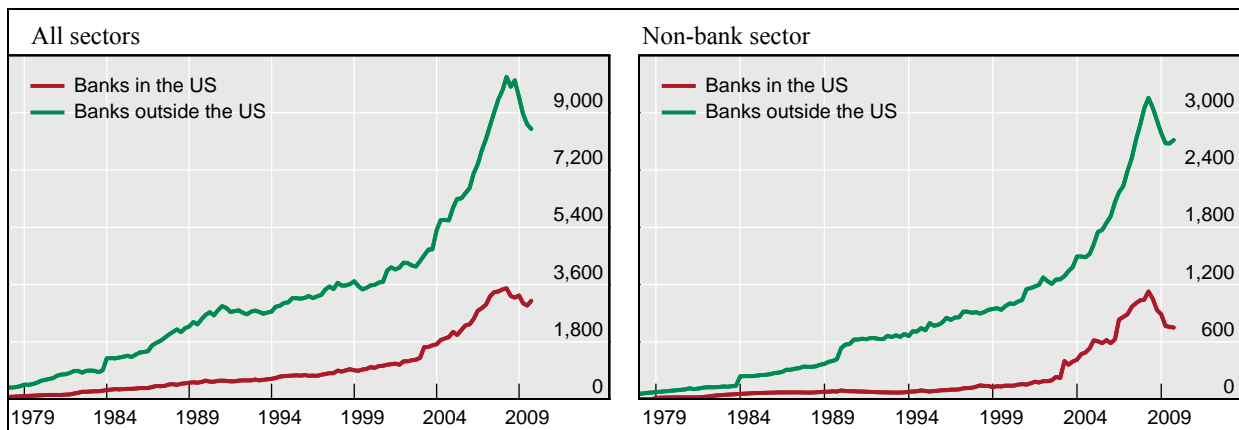
Sources: Federal Reserve, BIS international locational banking statistics by residence (deposit liabilities of reporting banks vis-à-vis non-bank sector).

\* US bank deposits estimated as M2 times M3/M2 in February 2006 (1.52) less outstanding currency.

Note:  $\chi^2$  statistic is 6082, indicating a rejection of the null hypothesis of independence of residence of depositor and location of the bank at the .0001 level of significance.

The offshore habitat for non-US residents to place dollars is nothing new and, indeed, it has been less pronounced in recent years. For the first 30 years of the Eurodollar deposit market, Federal reserve requirements gave non-bank depositors an incentive to hold their dollars offshore to avoid what was in effect a tax (Aliber (1980 and 2002), Kreicher (1982), McCauley and Seth (1992)). There was no immediate response to the Federal Reserve’s lowering the reserve requirement on domestic large-denomination deposits to zero in 1990. In the 2000s, however, BIS locational banking statistics show that non-US non-banks raised the share of their US dollar deposits with banks located in the US to over a quarter for the first time since the 1980s (Graph 1).

**Graph 1: US dollar liabilities to non-US residents by location of BIS reporting banks<sup>1</sup>**  
Amounts outstanding, in billions of US dollars



<sup>1</sup> Including total cross-border liabilities in all currencies and local liabilities in foreign currencies vis-à-vis residents of reporting countries.

Source: BIS international locational banking statistics by residence.

Official reserve managers also prefer to place US dollar deposits outside the United States, although their preference is not as strong as that of the private sector. Official holders of US dollar reserves (mostly central banks) bulked large among early placers of dollars in the euromarket (BIS (1965)). Table 2 shows that in recent years, more than 60% of official US dollar reserves were held with banks located outside the United States.

**Table 2: Official dollar deposits by location and nationality of banks**  
In billions of US dollars

Nationality of banks	December 2004 Location of deposits			December 2007 Location of deposits			December 2008 Location of deposits		
	US	Offshore	Total	US	Offshore	Total	US	Offshore	Total
US	73.6	7.8	81.4	143.1	28.1	171.3	127.6	32.5	160.1
Others	73.0	268.2	341.2	73.1	475.0	548.1	59.7	269.4	329.1
Total	146.6	276.0	422.7	216.2	503.2	719.4	187.3	301.8	489.2

Source: BIS locational banking statistics by nationality.

Note:  $\chi^2$  statistics are 138.2, 306.2, and 172.7 for 2004, 2007 and 2008, respectively, indicating a rejection of the null hypothesis of independence of nationality of banks and location of the official deposits at the .0001 level of significance.

There are a number of reasons why both private and public investors choose to place dollar deposits outside the United States. One motive is to separate currency risk from country risk. In other words, through offshore markets, investors can hold the currency without necessarily being exposed to the country. For a depositor, country risk refers to factors that might prevent the use of funds placed in a given jurisdiction. Historians of the Eurodollar market, the market for short-term dollar deposits outside the United States, have pointed to the former Soviet Union's placement of dollar deposits in London as one of the origins of the market (Einzig (1970, p. 30), Kindleberger (1973, p. 289)). Such placements could have been intended to conceal dollar payments from the US authorities and to permit dollars to be mobilised in the event of Cold War tensions. Such considerations may have led to an association of offshore deposits with non-US banks, since holdings in these would be harder for the US authorities to freeze.

Whatever the original preference for offshore deposits, there remains a strong association between location of official deposits and nationality of bank. Onshore deposits are kept disproportionately with US banks while offshore deposits are kept disproportionately with non-US banks (Table 2). This may reflect differences in the term of deposits, with deposits in US banks in the United States available at call for payment services while term deposits with non-US banks outside the United States serving as short-term investments.

The demand to separate currency risk from country risk may also be due to concerns for concentration of infrastructure or operational risk in one country. As central banks have lengthened their investment portfolios, their overall access to liquidity has become more dependent on the proper functioning of securities markets, including repurchase markets. Thus, the interruption of trading of US Treasury securities in September 2001 owing to terrorist attacks reminded officials of the potential benefits of having diverse trading and custodial locations. McCauley (2005) observed that, while normal operations with Treasury securities were interrupted, central banks with dollar

securities held in European depositories were still able to carry out normal operations with them, since the US payment system continued to operate and thus banks could make dollar payments.

A second consideration in choosing between onshore and offshore markets is yield differentials. For most of the life of the Eurodollar market, a substantial yield pick-up was available to those willing to place a deposit in a bank in London or another centre outside the United States (Kreicher (1982)). This yield premium reflected in early days a sense of greater risk attached to offshore dollars. For most of the 1980s, however, higher yields on dollars deposited outside the United States approximated the cost of domestic reserve requirements and deposit insurance (McCauley and Seth (1992)). (This suggested US depositors paid the cost of the reserve requirement and deposit insurance “taxes”). As noted, this latter regulatory reason to hold dollar deposits offshore mostly disappeared with the Federal Reserve’s reduction of the reserve requirement to zero in 1990. Whatever the cost of regulation had done to spur the growth of the Eurodollar deposit market, their marked reduction did not close it down.

A further consideration is the convenience factor: to some investors and fund-raisers, the regulatory environment, accounting standards, language, and time zone of the location of the offshore markets make them more convenient than the onshore markets.

## **2.2 The global dollar bond market**

The larger global dollar bond market also shows a bias, albeit a weaker one, of non-US investors for bonds issued by non-US residents and bonds issued in the offshore market. While market participants pay much attention to fluctuations in non-resident demand for US issuer’s bonds, in fact non-US resident investors in US dollar bonds invest disproportionately in bonds issued by obligors outside the United States (Table 3).<sup>4</sup>

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<sup>4</sup> If the residence of holder and issuer were independent, one would expect non-US residents to hold \$1,119 billion in bonds issued by non-US residents (= \$8,396 of dollar bonds held by non-US residents times the share of bonds issued by non-US residents (\$3,657/\$27,430)). Instead, Table 3 shows that non-US residents hold \$2,740 billion of bonds issued by non-US residents, more than twice the expected amount on the hypothesis of independence. Another way of looking at Table 3 is that US investors have a strong home bias, investing disproportionately in dollar bonds issued by US obligors.

**Table 3: The US dollar in the global bond market by issuer and holder**  
In billions of US dollars, at end-2008

US dollar bond issuer	Residence of holder		Total
	United States	Outside the US	
US resident	18,117	5,656	23,773
Non-US resident	917	2,740	3,657
Total	19,034	8,396	27,430

Sources: Department of the Treasury, Federal Reserve Bank of New York and Board of Governors of the Federal Reserve System, Report on U.S. Portfolio Holdings of Foreign Securities as of December 31, 2008, October 2009; *ibid.*, Report on foreign portfolio holdings of US securities as of June 30, 2008, April 2009, p. 23, BIS.

Notes:

1. Non-US resident holdings of US dollar denominated bonds issued by US residents is from June 2008 rather than end-2008. US resident holdings of US dollar denominated bonds issued by US residents estimated as a residual from total US dollar bonds issued by US residents as reported by the BIS and the June 2008 figure for non-resident holdings. US holding of US dollar bonds issued by non-US residents is at market value while total is at historical value.
2.  $\chi^2$  statistic is 3902, indicating a rejection of the null hypothesis of independence of residence of dollar bond issuer and dollar bond holder at the .0001 level of significance.

This bias of non-US investors for non-US obligors has resulted in their tapping the primary market outside the United States. Obligor from outside the United States issue the overwhelming majority of their paper offshore (Table 4). Historically, the offshore dollar bond market was boosted by US capital controls in the late 1960s into the 1970s and by withholding taxes into the mid-1980s. The first gave non-US obligors an incentive to issue in London, while the second gave non-US investors an incentive to buy US corporate bonds issued offshore or bonds issued by non-US obligors. Indeed, until the repeal of US withholding tax on bond interest, dollar bonds issued offshore by highly-rated sovereigns and companies (e.g. Kingdom of Sweden, IBM) yielded less than US Treasury bonds of the same maturity owing to the desire of non-resident investors to avoid the US withholding tax.

**Table 4: The US dollar in the global bond market by issuer and primary market**  
In billions of US dollars, at end-2008

US dollar bond issuer	Location of primary market		Total
	United States	Offshore	
US resident	19,206	4,567	23,773
Non-US resident	466	3,191	3,657
Total	19,672	7,758	27,430

Source: Dealogic; Euroclear; ISMA; Thomson Financial Securities Data; national authorities, BIS.

Note:  $\chi^2$  statistic is 7, indicating a rejection of the null hypothesis of independence of residence of dollar bond issuer and location of primary market issuance at the .0001 level of significance.

Since the mid-1980s, the onshore and offshore markets have become integrated in their pricing. Still, even given limited information on holdings of dollar bonds, it is evident that offshore investors are overrepresented among holders of bonds issued by non-residents offshore (Table 5).

**Table 5: Holders and primary market of US dollar bonds of by non-US obligors, December 2008**

Investor	Bond originally sold		
	Onshore	Offshore	Total
US	n.a.	n.a.	917
Non-Us	n.a.	n.a.	2,740
Total	466	3,191	3,657

Source: Department of the Treasury, Federal Reserve Bank of New York and Board of Governors of the Federal Reserve System Report on U.S. Portfolio Holdings of Foreign Securities as of December 31, 2008, October 2009, p. 14; Dealogic; Euroclear; ISMA; Thomson Financial Securities Data; national authorities, BIS.

Note: US holding of US dollar securities is at market value while total is at historical value. Not available = n.a.

Thus, judging from the US dollar, foreigners tend to prefer to transact in a particular currency through the offshore markets. Non-US residents, private and official alike, keep the bulk of their US dollar deposits outside the United States and invest disproportionately in US dollar bonds issued by non-US residents.

That said, it should be clear that in the normal case the offshore market does not exist in isolation. In fact, the payment flows associated with these accounts and investments ultimately pass through bank accounts in the United States, just as payment flows associated with non-bank financial intermediaries in the United States ultimately pass through banks in the United States. While the US authorities put in place capital controls from the late 1960s until the early 1970s, they never impeded the flow of payments through US banks to allow the settlement of offshore trade and investment transactions. Offshore markets in a currency can flourish if offshore financial institutions are able to maintain and to access freely clearing balances in the currency with onshore banks (Dufey and Giddy (1978)). In other words, non-resident convertibility of the currency is allowed at least for overseas banks. Once this condition is met, both long and short positions in the currency can be built up offshore even without a wholesale liberalisation of capital account controls by the onshore country authorities. If offshore banks do not have free access to clearing banks kept with onshore banks, then offshore markets can still exist, though in more a limited fashion, through non-deliverable contracts, as argued below.

### **3. MONETARY STABILITY**

The development of offshore markets in a given currency poses several challenges to a central bank's responsibility for maintaining monetary stability.<sup>5</sup> An offshore market in a given currency can increase the difficulty of defining and controlling the money supply in that currency. Equally, an offshore market in a given currency can pose a challenge to measuring and controlling bank credit. For example, if domestic firms and households, perhaps through the aggregation of some non-bank financial institution (like money market funds), substitute offshore deposits in the domestic currency for onshore ones, and these in turn are lent back into the economy, so-called round-tripping, hard-to-measure and hard-to-control offshore deposits and credit can substitute for their domestic counterparts. If monetary policy is based to some extent on the control of money or credit, then the effect of offshore use of the currency on money or credit should be factored in when setting monetary targets or monitoring ranges.

Offshore activity in the currency might also affect the shape of the yield curve or the exchange rate. If the central bank sets the overnight rate (or some other short-term interest rate) with a view towards target inflation and growth, then policymakers will have to factor these effects into their inflation forecasts and set the short-term interest rate appropriately.

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<sup>5</sup> For a discussion of relevant issues, see Gao (2009).

We first consider the interactions of an offshore market with the control of money or credit, with a focus on the credit multiplier and the use of reserve requirements. We conclude that, as long as capital controls are maintained, the authorities can control offshore deposits unilaterally through reserve requirements. In the absence of capital controls, experience suggests that it is possible to impose reserve requirements on banks' net funding in domestic currency from offshore, albeit at the cost of some distortions across firms and banks. Banks not incorporated in the home country can get around such requirements by funding and booking loans offshore that are extended to domestic firms.

We then consider the issues that arise with regard to offshore investors' influence on the onshore yield curve. Here we emphasise that an offshore domestic currency yield curve has already come into existence on the back of the non-deliverable offshore currency market and that adding offshore deliverability may not represent a large change. We sketch the longer-term implications for the yield curve of offshore activity in a currency, which depend on the impediments to foreign investment in the domestic market, and the relative size of the offshore and onshore markets. If the influence of offshore money markets on the onshore interest rates is significant and warrants a response, it is possible for the home central bank to intervene in the offshore markets through private or public sector agents.

The implications of offshore activities for the exchange rate ultimately depend on how the long and short positions of the currency in offshore markets balance out. Capital controls may at present place restrictions on the ability by offshore market participants to take either long or short positions. In this context, offshore nondeliverable exchange markets already permit speculative bets on the currency that may add pressure on the exchange rate given prevailing macroeconomic conditions. Greater integration of the onshore and offshore foreign exchange market would make these pressures more immediate. In the longer term, and under more liberalised capital account regimes, the influence on the exchange rate depends largely on the level of domestic interest rates relative to global levels. Relative low interest rates would tend to make the currency a borrower's currency and its offshore use a net source of downward pressure on its exchange rate. Conversely, relative high interest rates would tend to make the currency an investor's currency and its offshore use a net source of upward pressure on its exchange rate.

### **3.1 The definition of money**

If the monetary policy strategy involves targeting or monitoring some monetary aggregate, then it is important to define such aggregate properly. Should the definition of money include offshore deposits in the domestic currency? Major central banks tended to answer this question in a manner that balanced principle with pragmatic considerations. In principle, offshore deposits held by domestic residents should be

included in a monetary aggregate, because such deposits tend to have a high degree of substitutability with onshore deposits. The appropriate aggregate would tend to be M2 or M3, since these offshore accounts do not typically serve as transaction accounts.<sup>6</sup> Nevertheless, availability of data can be a major constraint. Comprehensive data on offshore deposits are typically available only quarterly from sources such as the BIS. Policymakers who wish to make use of monthly or weekly data may need to rely on data that are made available by a subset of co-operating central banks.

### **3.2 The credit multiplier and reserve requirements on offshore deposits**

When targeting or monitoring monetary aggregates, home central banks face the general question whether credit extension in domestic currency in offshore centres significantly weakens the ability of onshore authorities to control such aggregates. The question arises because offshore banks operate in a different jurisdiction than onshore banks and therefore face different regulatory burdens and cost structures. This issue was extensively discussed and debated in the 1970s and the early 1980s and Box 1 summarises the discussion. It should be remembered that the monetary strategy of not only the Bundesbank and Swiss National Bank, but also that of the Federal Reserve, put emphasis on the control of monetary aggregates and that other central banks on the Continent sought to control credit aggregates. In this context, reserve requirements served a larger purpose than they generally do in advanced economies these days, i.e. to stabilise the demand for bank reserves, or in some places to tax the banking system<sup>7</sup> (Borio (1997)).

Perhaps the best formulation was that the offshore markets, like domestic non-bank financial institutions such as thrifts in the US, decrease the effective reserve ratio, or equivalently increase the credit multiplier of a given sum of bank reserves (Aliber (1980)). So whether they made monetary policy more difficult depended on whether the home central bank can impose unilateral reserve requirements on offshore deposits. As long as this ability is retained, even if offshore credit extension in domestic currency leads to a multiple expansion of deposits (taking into account any “leakage” to the domestic market), the home central bank would still be able to maintain control through setting the reserve requirement.

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<sup>6</sup> “Sweep” accounts are borderline cases. With these accounts, amounts outstanding in a domestic transaction account as of a certain hour are swept into an offshore account.

<sup>7</sup> Whether control of base money given reserve requirements suffices to control monetary or credit aggregates in a textbook fashion is a question beyond the scope of this paper. Borio (1997, p.48) notes that during the period of non-borrowed reserves targeting (October 1979 – October 1982), the Federal Reserve used semi-lagged reserve requirements in which required reserves were largely pre-determined, working against causation going from reserves to money. Only after this period were reserve requirements made contemporaneous. See Ho (2008), pp. 12 - 16 for the contemporary uses of reserve requirements in Asia.

### **Box 1**

#### **The Eurodollar multiplier**

Working under James Tobin at Yale, Swoboda (1968) came up with the notion of a Eurodollar multiplier, which was subsequently taken up by Friedman (1969). The question posed was by how much some monetary or credit aggregate would expand on the basis of another, say, million dollars deposited in London in the Eurodollar market. On the basis of various proposed answers, the G-10 central banks decided to cap and then gradually draw down their direct deposits in the Euromarkets (Toniolo (2005, pp. 465 - 466)).

Aliber (1980) argued that the euro-market, like non-bank financial intermediation, served to economise on needed base money. Big banks operated in both the offshore market and the onshore market, and in major onshore jurisdictions they were required to hold reserves with the central bank well in excess of operational requirements. Thus, offshore deposits could be serviced out of such required reserves. The result was that the effective reserve requirement was lower (or the effective credit multiplier was higher).

The implication is that, though the Euromarkets may make control of monetary aggregates more complicated or difficult, they do not make it impossible. "If one bluntly asked whether the Euromarkets are, in themselves, a source of unbridled credit growth, the answer of most professional writers on the subject would be unambiguously in the negative." (Swoboda (1980)). As long as there is some degree of convergence of regulations and reserve requirements affecting domestic and offshore bank lending and borrowing, and a revision of appropriate monetary targets in view of the existence of offshore markets for domestic currency deposits, the offshore market would not pose a serious threat to the ability of the onshore central bank to control the money supply. This was thought to be the lesson of experience of the US Federal Reserve, even at the St Louis Federal Reserve, which then focused on the monetary base (Balbach and Resler (1980)).

In retrospect, however, it is not so clear that adequate account was taken of the credit and liquidity growth in the Euromarkets. A view at the Federal Reserve Bank of New York was that inflation accelerated in the 1970s in part because the single-digit growth of various measures of money in the United States seemed reassuring even the Eurodollar market expanded at rates like 20 - 30% a year. And two years after the above views were published, the developing country debt crisis would re-pose the question of whether the easy and excessive credit to Latin American borrowers was only incidentally raised in the Euromarkets (see below).

In major currencies, the notion that reserve requirements might be placed on offshore deposits sounds strange to modern ears. Yet a generation ago, when the Federal Reserve had as an intermediate target some measure of money, the possibility was actively explored (Frydl (1982)).<sup>8</sup> An important threshold consideration was whether reserve requirements would be applied to one currency or to all currencies. If only to one currency, it was reasonable to expect market participants to avoid the requirements with the use of forward contracts. For instance, if offshore US dollars but not offshore yen were subject to a reserve requirement, an investor could make a yen deposit and sell the yen forward against the dollar, in effect holding a synthetic dollar deposit but not subject to the reserve requirement.<sup>9</sup>

This reasoning would hold as long as covered interest rate parity held, so that offshore forward foreign exchange rates just reflect interest rate differentials. This condition is the same as the absence of effective controls on capital flows between the domestic and offshore money markets. It has generally been fulfilled, for example, for the yen-dollar ever since the early 1980s. An important result, therefore, is that effective reserve requirements on a single currency offshore ultimately depend on capital controls that succeed in splitting the onshore and offshore money markets. In other words, reserve requirements can be used unilaterally with some expectation of effectiveness *if* offshore investors are not able to deal in forward foreign exchange contracts that embody the difference between domestic and dollar money rates.

Such is the case for the renminbi and the Indian rupee. Thus, there is, at least in a transition period, scope for the extension of monetary control to offshore deposits in these currencies. Given that, there are two dimensions to the technical choice of reserve requirement implementation. First, the required reserve can be payable to the host central bank or to the home central bank of the currency. Secondly, the required reserve can be remunerated at zero (or a fixed rate below market rates) or at a market rate.

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<sup>8</sup> A study group was formed at the Bank for International Settlements chaired by the head of the Board of Governors' Division of Monetary Affairs. Its report will become part of the public domain in 2010, thirty years after it was filed.

<sup>9</sup> Henderson and Waldo (1980) refer to this as the "redenomination incentive". US dollar deposits sold forward against Canadian dollars were already prevalent in the Canadian dollar money market.

In Hong Kong, renminbi deposits are not subject to any *de jure* reserve requirements. However, until recently, the *de facto* reserve requirement had been set at 100%, because all deposits had to be re-deposited at the People's Bank of China (PBoC) through the clearing bank. This means that renminbi deposits in Hong Kong have been feeding a "narrow" banking system in which assets consist solely of government liabilities (PBoC reserves in this case). With the introduction of trade credit in July 2009, the reserve requirement has been effectively lowered, but for practical purposes will remain above 25% given that the HKMA imposes a 25% liquidity ratio requirement on such deposits.

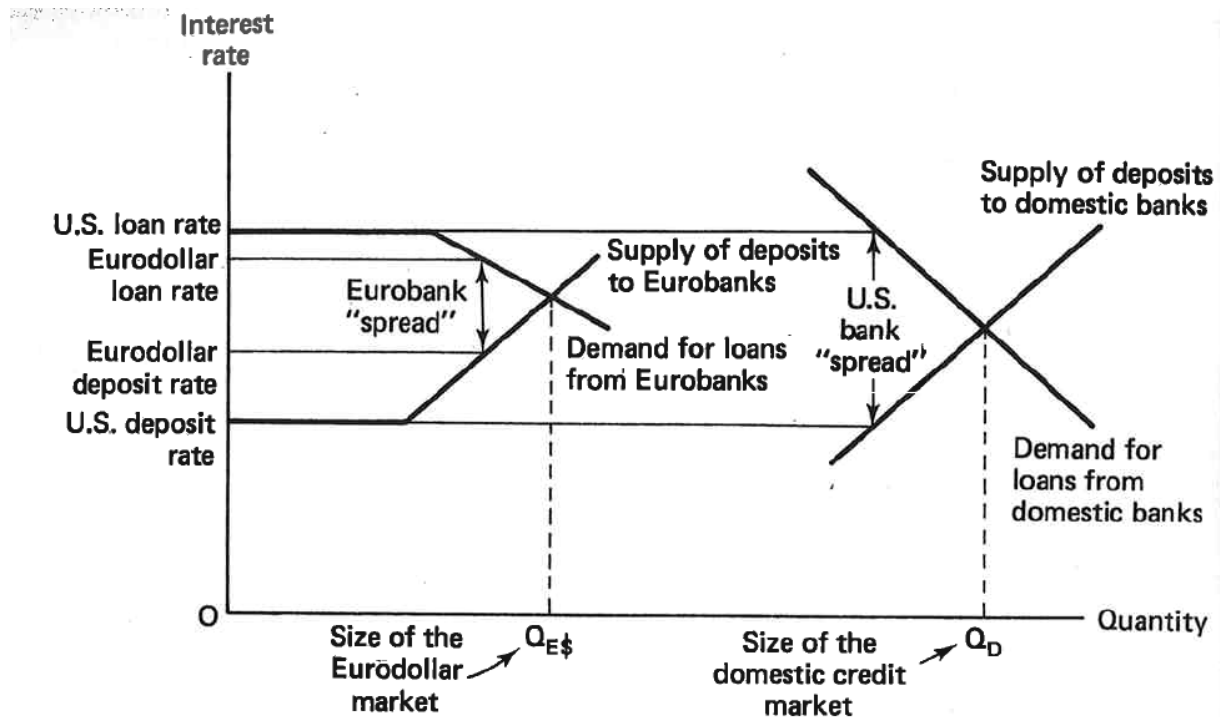
Owing to the absence of reserve requirements, banks in London could and did pay a premium over large-denomination certificate of deposit rates for time deposits in London. (The same absence of reserve requirements allowed LIBOR-based loan pricing to be competitive versus prime-based loan pricing in the United States.) By contrast, renminbi deposit rates, constrained by the *de facto* high reserve requirement and the rate of remuneration thereon, have been lower in Hong Kong than on the Mainland (see Box 2).

### Box 2

#### Offshore and onshore interest rates and the renminbi deposits in Hong Kong

Owing to the absence of reserve requirements, deposit insurance fees and the like, offshore banking can operate with narrower intermediation margins. Thus offshore wholesale deposits typically yield more than their onshore counterparts, while offshore loans can be priced below their onshore counterparts (if the markets are segmented). In view of this regularity, the pricing of renminbi deposits in Hong Kong below comparable rates on the Mainland is at variance with euro-market experience.

Box 2 Graph 1: The relationship of on- and off-shore deposit and lending rates



Source: Dufey and Giddy (1978, p. 52).

Building on Aliber (1980), Kreicher (1982) conceived of the linkage of domestic and euro-market deposit rates in terms of an arbitrage tunnel. This tunnel was based on the arbitrage between the all-in cost of domestic certificates of deposit compared with LIBOR.

$r_t^{\text{eurodollar}} = (r_t^{\text{domestic certificate of deposit}} + \text{FDIC}_t) / (1 - \text{RR}_t)$ , where  
 $r_t^{\text{eurodollar}}$  is LIBID or LIBOR at time  $t$ ;  
 $r_t^{\text{domestic certificate of deposit}}$  is the US domestic wholesale certificate of deposit rate at time  $t$ ;  
 $\text{FDIC}_t$  is the premium for Federal Deposit Insurance at time  $t$ ; and  
 $\text{RR}_t$  is the reserve requirement on large, nonpersonal deposits at time  $t$ .

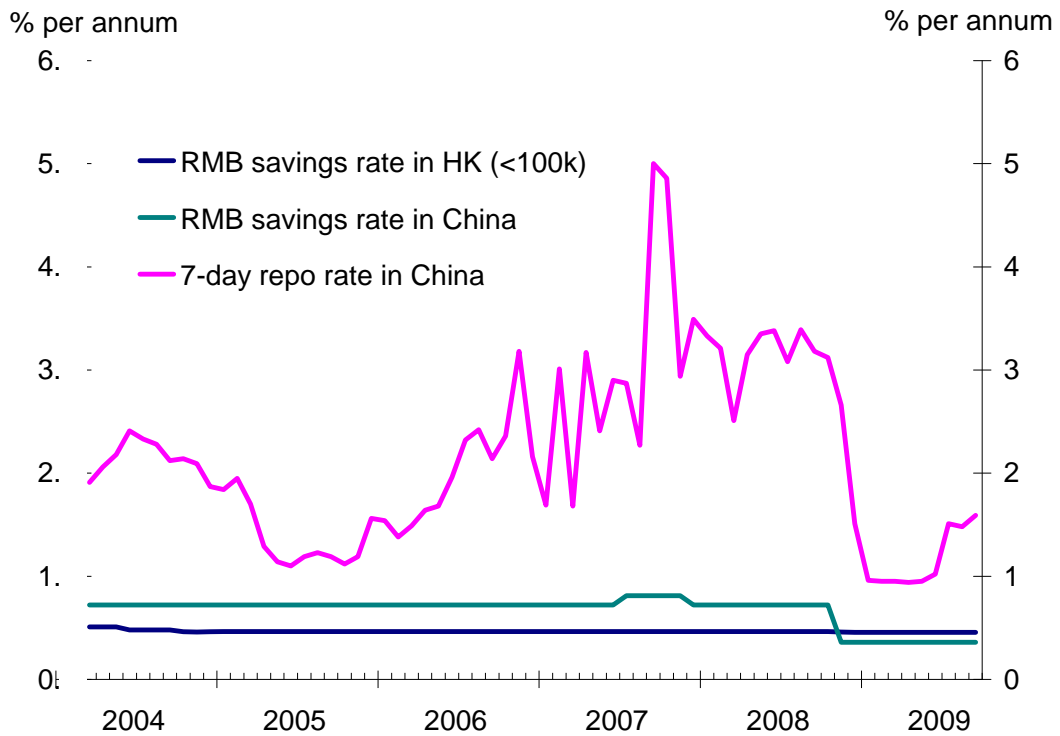
The arbitrage takes place in a tunnel as a result of bid-ask spreads (e.g. LIBOR vs LIBID, placing costs for the US certificate of deposit). It follows that the Eurodollar market is more competitive at higher rates of (unremunerated) required reserves, at higher premia for deposit insurance and at higher interest rates overall.

Such pricing, of course, induces borrowers and placers of funds to move to the offshore market. Historically, sovereign borrowers and large firms found it easy to shift to US dollar loans syndicated largely or exclusively with offshore banks and priced off the offshore reference rate, LIBOR. Both classes of borrowers were quick to insist on their large bank loans being priced off LIBOR in addition to (or instead of) the domestic benchmarks of prime or US certificates of deposit shortly after LIBOR gained ground against the latter (McCauley (2001)). By the end of the 1980s, LIBOR was the pricing reference for most corporate loans and prime had been relegated to the status of benchmark for consumer loans.

US depositors showed greater stickiness in their holding of domestic wholesale deposits. One can call it home bias, or perceived country risk or inertia, but institutional investors took their time in the 1980s to switch to more remunerative deposits in the Caribbean or London. Money market funds, which compete fiercely on the basis of yield, were among the first to give a substantial weight to offshore deposits among their bank paper. By mid-2008, about half of prime money market funds were invested in foreign bank paper, including Eurodollar deposits (Baba et al (2009)).

Yields on offer on renminbi deposits in Hong Kong, by contrast, have not been very tempting when seen from the Mainland. The savings rate on renminbi deposits in Hong Kong lies well below wholesale rates as represented by the 7-day repo rate in China in the graph below. Admittedly, the renminbi accounts in Hong Kong have not been structured for large-denomination time deposits that would be more comparable to money market yields on the Mainland. But the Hong Kong renminbi savings yield had even, until late 2008, lain below the regulated renminbi savings rate in China (Graph 2). Nevertheless, the yields of renminbi bonds issued in Hong Kong, which were priced by the market, were closer to those on the Mainland (Table A).

**Box 2 Graph 2: RMB interest rates**



**Box 2 Table A: Renminbi-denominated bond issues in Hong Kong**

Issuers	Issuance date	Issuance size	Maturity	Interest rate
China Development Bank	July 2007	RMB 5 bn	2 years	3.00%
The Export-Import Bank of China	July 2007	RMB2 bn	2 and 3 years	3.05% and 3.2%
Bank of China	September 2007	RMB 3 bn	2 and 3 years	3.15% and 3.35%
Bank of Communications	July 2008	RMB 3 bn	2 years	3.25%
The Export-Import Bank of China	September 2008	RMB 3 bn	3 years	3.4%
China Construction Bank	September 2008	RMB 3 bn	2 years	3.24%
Bank of China	September 2008	RMB 3 bn	2 and 3 years	3.25% and 3.4%
Bank of East Asia (China)	July 2009	RMB 4 bn	2 years	2.8%
HSBC (China)	July 2009	RMB 1 bn	2 years	38bp over 3M SHIBOR
China Development Bank	August 2009	RMB 1 bn	2 years	38bp over 3M SHIBOR
China Development Bank	August 2009	RMB 2 bn	2 years	2.45%
HSBC (China)	September 2009	RMB 2 bn	2 years	2.6%
Ministry of Finance	October 2009	RMB 6 bn	2, 3 and 5 years	2.25, 2.7 & 3.3%

Source: HKMA.

### **3.3 Reserve requirements on net funding from offshore markets**

Even if the home authorities cannot control the growth of offshore deposits with reserve requirements, they may still be able to use this tool to control domestic bank credit, if not all credit extended from offshore. US precedents show that the absence of reserve requirements on Eurodollars led to the adaptation of the monetary management tool to cover net funding from the Eurodollar market. In this manner domestic credit extension that depended on net funding from the Eurodollar market was not able to circumvent this tool of monetary control.

Under Federal Reserve Regulation D, which governs reserve requirements, banks had to hold a non-interest-bearing account when it sold a large certificate of deposit in the United States. In addition, once a bank's US offices had collectively run up a net obligation to its branches outside the United States, the bank had to hold a non-interest-bearing account against additional Eurodollar liabilities funding US assets. US chartered banks' Eurodollar reserve requirements were assessed against not only their borrowing from their foreign branches, but also their lending to US non-bank customers booked at their foreign branches. Obviously, this required the collection of detailed data on the branches outside the United States. But as a result, US-chartered banks could not get around the Eurodollar reserve requirement by booking loans to domestic customers offshore.

However, foreign banks operating in the United States did not provide such information on their offshore operations and were assessed the Eurodollar reserve requirement on a less inclusive base. As a result, foreign banks operating in the United States could, and did (McCauley and Seth (1992)) engage in regulatory arbitrage by booking loans to US firms offshore in financial centres that did not impose reserve requirements. In the hotly contested US corporate loan market in the 1980s, foreign banks claimed a market share of half or more.

Thus, a measure of monetary control was achieved by the US authorities at the cost of the competitive position of US-chartered banks in their home corporate loan market. And the distortion did not stop there. US multinationals could borrow dollars from US or other banks offshore and funnel the funds into their US operations. So both US banks and strictly US-based firms without banking relationships with non-US offshore banks could be placed at a competitive disadvantage by the working of the Eurodollar reserve requirement. However, the distortion of competition should not be overstated. At an interest rate of 4% and a reserve requirement of 3%, the cost is only about 12 basis points. The distortion can also be reduced by remunerating required reserves.

The conclusion to be drawn from the US experience is that the monetary control that could not be unilaterally extended to offshore deposits could be imposed on credit to domestic borrowers funded offshore. Such a policy left a loophole, namely non-US banks' lending to US firms from offshore. The policy thus entailed distortions in competition in the banking market owing to the uneven application of rules on foreign and domestic banks. But these distortions can be mitigated by a non-zero rate of remuneration on reserves.

### **3.4 Offshore markets and the yield curve**

For central banks that implement monetary policy by targeting some short-term interest rates, the influence of offshore markets on onshore interest rates needs to be factored in. If such influence is significant and undesirable, they can choose to intervene in the offshore markets, through private or public sector agents in such markets. Below we discuss the effect of the development of an offshore market on domestic interest rates under two headings: with and without capital controls. Experience to date with the offshore market in non-deliverable renminbi or rupee suggests little feedback to domestic money or fixed income markets. Under more liberalised conditions, however, the effect is likely to depend negatively on the size of the economy and on the level of domestic interest rates relative to global levels.

#### *3.4.1 Offshore markets with capital controls*

For a number of emerging market currencies, offshore non-deliverable money and fixed income markets already trade quite actively. The non-deliverable forward exchange market serves as a money market and the non-deliverable interest rate swap markets serve as the fixed income market. For Brazilian real, renminbi and Indian rupee, these "virtual" markets had become, by April 2007, quite sizeable in relation to their onshore counterparts (Table 6). In other words, more or less well developed yield curves for these currencies offshore are already traded offshore. In such cases, adding an offshore deliverable money and bond market may not represent a large change.

**Table 6: Onshore and offshore money and fixed income markets  
for three emerging market economies**  
(billions of US dollars in daily turnover)

	Foreign exchange						Interest rate swaps, forward rate agreements, interest rate options		
	Forwards and forex swaps			Currency swap			Total	Domestic	Offshore
	Total	Domestic	Offshore	Total	Domestic	Offshore			
BRL	5.5	0.3	5.3	0.31	0.27	0.04	1.749	0.071	1.678
RMB	5.6	0.9	4.7	0.13	...	...	0.185	...	...
INR	12.1	8.5	3.6	0.41	0.40	0.01	3.494	3.080	0.414

Source: BIS, Triennial Central Bank Survey, 2007.

But because of capital controls, these offshore yield curves are quite distinct from their domestic, onshore counterparts. No doubt there are opportunities for arbitrage between them, but such transactions do not carry sufficient weight to force these yield curves into line. Making the currency deliverable offshore would not necessarily alter this state of affairs appreciably. After all, Mainland equities can be delivered offshore, i.e. H shares in Hong Kong, but the price gap between otherwise identical onshore (A shares in Shanghai) and offshore shares (H shares in Hong Kong) can be very substantial indeed (Peng, et al (2007); Ma and McCauley (2009)).

In particular, when these currencies are under upward pressure, then the offshore yield curves tend to be below their onshore counterparts. Perhaps of greater possible concern to the domestic authorities would be the opposite configuration. If the offshore yield curve trades above the domestic yield curve, it provides incentives for domestic residents to shift bank deposits offshore. Such a situation could emerge owing to downward pressure on the currency, and become destabilising.

Under these circumstances, the home central bank may have concerns. There are precedents for the home central bank to do liquidity operations in the offshore markets. Toniolo (2005, p. 461) reports:

[C]entral banks and the BIS were already intervening, if quietly, in the market to try to keep the differential between interests paid on Eurocurrency and on domestic currency deposits within desirable limits. From 1965 onward the BIS itself, together with the Swiss National Bank, intervened in the market in order to moderate interest rate differentials caused by seasonal movements in and out of the Eurocurrency market. In December 1966, for instance, the Federal Reserve Bank of New York and the Swiss National Bank made available to the BIS, through swaps, close to \$500 million, which the BIS then channelled in to the Eurodollar market. Such operations... became more frequent and more important in size as the market grew larger.

In the past two years, during the global financial crisis of 2007 - 2009, under conditions of widespread disruption of markets, the Federal Reserve has partnered with central banks all over the world to try to manage the LIBOR, the benchmark (and offshore) US dollar rate. In the case of emerging market currencies such as the renminbi, one could easily imagine the home central bank carrying out such operations through public or private sector agents in the offshore market were circumstances to warrant interventions. Such policy options should help alleviate concerns for instability that may arise because of interest rate differentials between the onshore and offshore markets.

#### 3.4.2 Offshore markets without capital controls

With liberalised capital flows between onshore and offshore markets, it is possible for offshore markets to dominate onshore markets in the determination of interest rates, especially when the onshore market is small as compared to the offshore markets. The recent case of New Zealand sounds a warning regarding the interaction of monetary policy and a thoroughly internationalised currency. At the outset it should be recognised that this is an extreme case in that the New Zealand bond market is among the most internationalised in the world. Most of it is offshore: only about a quarter of New Zealand dollar bonds are domestic issues in the domestic market, vs 50% for euro denominated bonds or 75% for US dollar bonds (McCauley (2009); Munro and Wooldridge (2009)).

As the Reserve Bank of New Zealand tightened in 2005 - 07, heavy Japanese purchases of offshore kiwi bonds kept important private sector term yields from rising in step. In particular, only about half of the 300-basis-point tightening of the overnight rate was communicated to the three-year interest rate swap yields. Since historically the New Zealand mortgage market financed houses with floating rate loans, this inverted yield curve might have only tempted a few more firms to sell bonds to replace bank debt. However, mortgage borrowing shifted out from being based on 90-day rates to 3-year rates. The combination of the weight of Japanese money on term yields and the responsiveness of the mortgage market in taking advantage of these low term yields illustrates strikingly how an internationalised bond market can pose a challenge to monetary policy.

For larger economies, the offshore markets are less likely to play a crucial role if there are not impediments to investment in the domestic bond market. For New Zealand and Australia, given their relatively small government debt, there was a shortage of high-quality bonds issued by domestic obligors. The offshore markets in effect recruit opportunistic high-quality global issuers (such as European agencies or supranational organisations) to supplement the scarce supply of quality domestic issuers. For a large country, there is less likely to have such a constraint and the marginal contribution of the

offshore market to the investment menu in the domestic bond market is likely to be smaller.

For the United States in recent years, the argument is that foreign investment in domestically issued bonds of the Treasury and agencies has lowered bond yields (see for example Warnock and Warnock (2006), accounting for the so-called conundrum) and stimulated such interest-sensitive sectors as residential housing. Whatever the truth of this claim<sup>10</sup>, for the present purposes, it is worth noting that the argument makes no reference to the offshore US dollar bond market. For large economies, the onshore bond markets have offered better secondary market liquidity, and dominated offshore markets in determining the yield curve.

### **3.5 Offshore markets and the exchange rate**

Again it is useful to discuss the effect of the development of an offshore market on the exchange rate under two headings: with and without capital controls. Under capital controls, the offshore use of a currency has in general an ambiguous effect on the exchange rate. While experience to date with the offshore market in renminbi suggests that it has tended to put upward pressure on the renminbi's exchange rate, this should be seen as a result of the prevailing foreign exchange, macroeconomic and political circumstances, such as increasing movements of other currencies, current account surpluses and international pressures for a faster pace of appreciation. Under more liberalised conditions, however, the overall effect of offshore use of a currency is likely to depend on whether it is used both as an investment and a borrowing currency or mostly one or another. And this in turn is likely to depend on the level of domestic interest rates relative to global levels.

#### *3.5.1 Offshore markets with capital controls*

Offshore trading in non-deliverable contracts can already affect the exchange rate. Existing non-deliverable forward markets might at first seem to have no effect on the spot exchange rate, since non-deliverable contracts can be considered nothing but side bets by offshore players with no net effect. But market participants with operations both outside and inside the economy can take one side of the offshore market and the other in the domestic market and thereby transmit selling or buying pressure from the offshore non-deliverable market to the onshore cash market. For instance, if foreign investors want to take long positions in the currency, multinational firms can

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<sup>10</sup> Rudebusch, Swanson, and Wu (2006) found foreign official purchases of US Treasuries played little or no role in the "conundrum". See also Genberg et al (2005). Ben Bernanke stated in a speech in March 2006 that "A reasonable conclusion is that the accumulation of dollar reserves abroad has influenced US yields, but reserve accumulation abroad is not the only, or even the dominant, explanation for their recent behavior."

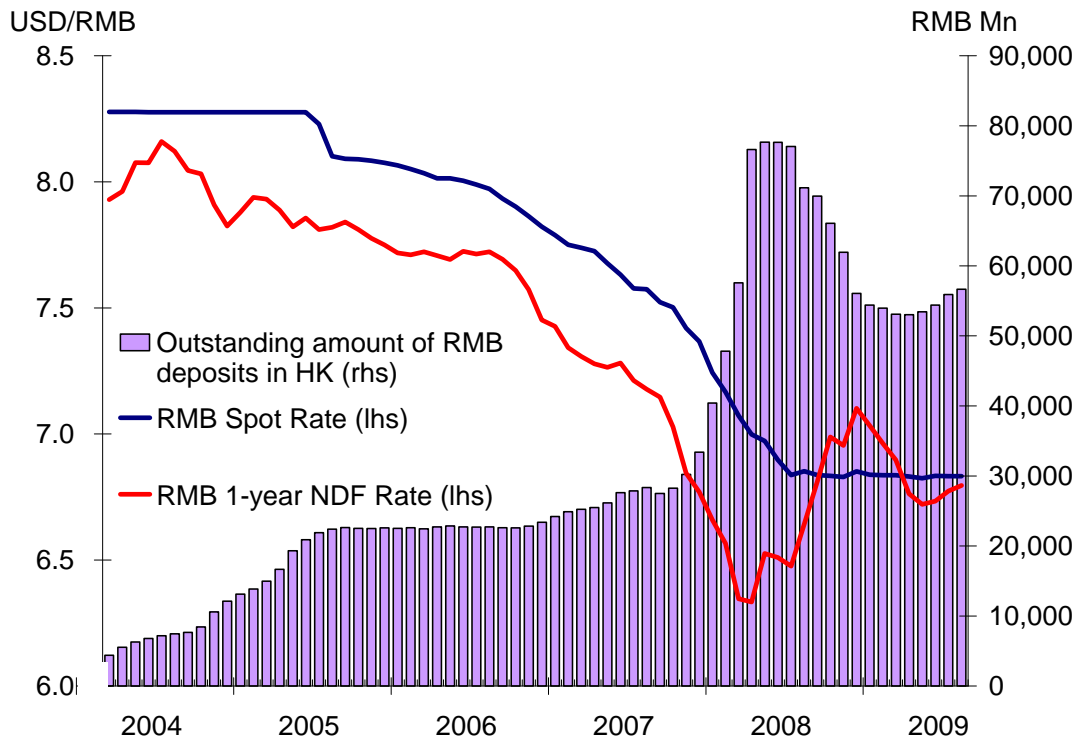
accommodate them by retaining local currency earnings within the economy that would have otherwise have been paid out in foreign currency as dividends. Such long cash positions in the domestic currency can be profitably hedged through the short sale of the currency in the non-deliverable market. As a result, demand for dollars by the multinational firm would be lower than it would have been otherwise, and the onshore spot market would feel the effect.<sup>11</sup>

When offshore markets develop under capital controls, the sequencing of permissible activities can determine the direction of effect on the exchange rate. In the case of the Hong Kong, until the recent introduction of trade credit, renminbi banking has favoured the creation of deposits over the creation of loans, or the accumulation of long over short positions. To the extent that Hong Kong residents end up holding more long positions in renminbi than they would otherwise have held, then the Mainland ends up with a larger domestic-currency liability, and a larger foreign-currency claims on the rest of the world, than it would otherwise have had. In flow terms, the sale of Hong Kong or US dollars by a Hong Kong resident to purchase the renminbi account could put upward pressure on the renminbi's exchange rate and lead *ceteris paribus* to a larger purchase of foreign exchange by the PBoC (which forms the counterpart to the reserve liability), although in practice the scale of such flows were insignificant as compared to the overall inflows that the Mainland experienced. It is also interesting that the demand for the renminbi balances has not been a one-way bet and has had a speculative element, increasing when the non-deliverable forward pointed to appreciation but decreasing in the absence of such a signal (Graph 2). We can expect that developments to allow non-residents to issue liabilities in renminbi would help balance out the pressures on exchange rate from long-only positions.

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<sup>11</sup> To the extent that the central bank aims at stabilising the exchange rate, it may need to accumulate larger international reserves.

**Graph 2: RMB exchange rate and deposits in Hong Kong**



### 3.5.2 Offshore markets without capital controls

It is useful to distinguish symmetrical use of a currency offshore from asymmetric use. In the first case, non-residents both invest in a currency and borrow it. The net of the two may vary over time, but as a broad observation, both take place. In the asymmetric case, non-residents mostly borrow or mostly invest in a currency. This distinction was introduced by Sakakibara and Kondoh (1984) who feared that the Japanese yen would attract foreign investment but not foreign borrowing. Of course, it has turned out the opposite: the yen has served international investors more as funding currency than as a place to invest.

The yen is not the only case of what Sakakibara and Kondoh called “lopsided” internationalisation. The Australian and New Zealand dollars do not seem to attract any consistent borrowers from outside those economies. If one considers these cases, and contrasts them to the euro and the dollar as cases of balanced internationalisation, interest rate levels seem to be key. Investors have been drawn to the Antipodean currencies by their high coupons; borrowers (and shorts) have been drawn to the yen by its low interest rate; and the euro and the dollar have tended to be in the middle.

So that poses the question of whether an emerging market contemplating the offshore use of its currency sees itself as a high- or low-interest rate economy.

The authorities in Brazil or India probably would not pause before answering “high”, though noting that interest rates have come down with inflation and that further progress can be anticipated. The authorities in China, by contrast, with its high savings, large current account surpluses and low inflation, might look forward to being a low interest rate currency. That would make it a borrower’s currency and its offshore use a net source of downward pressure on its exchange rate. The case of Japan suggests that this outcome does not exclude a tilt towards appreciation against major currencies like the US dollar.

#### **4. FINANCIAL STABILITY**

The internationalisation of a currency raises not only monetary policy issues but also financial stability issues. In what follows, we highlight those that bear on a bank-dominated financial system, such as that in China and India. We organise the discussion in three parts. First, we outline the risks arising from the international operation of domestic banks in foreign currency. These precede, logically and in practice, the risks created by the internationalisation of the domestic currency, and serve as a baseline. Then we consider the risks that arise when domestic banks are able to swap domestic currency for foreign currency, thereby lowering the credit standing required of domestic banks to engage in foreign currency lending. Finally, we highlight the risks that arise from the lending of both domestic and foreign banks in domestic currency.

##### **4.1 International operation of domestic banks in foreign currency**

It is important to recognise that the domestic banking system runs risks in participating in international banking operations even on the basis of established international currencies. These risks arise before the domestic authorities permit the domestic currency to be internationalised to any substantial extent and need to be appreciated in order to focus on the risks that are proper to the internationalisation of the domestic currency. When domestic banks operate branches abroad, and these borrow and lend in foreign currency, the banks’ domestic capital buffers must absorb any losses on foreign currency assets. The position is much the same if domestic banks open subsidiaries abroad. Unless these are substantially overcapitalised, unanticipated losses on foreign currency assets require the injection of capital in foreign currency.

Examples can readily be provided for such risks. Over the past two years, European banks have reported substantial losses on holdings of asset-backed securities based on US assets. These securities were generally denominated in the US dollar. As write-offs were taken on these dollar assets, the European banks found themselves with more liabilities than assets denominated in the dollar, and had to buy dollars to square their position. In this manner, European banks’ losses on dollar assets not only reduced

their share prices but also the value of the euro against the US dollar (McCauley and McGuire (2009)).

European banks were not alone in realising such risks. Mainland commercial banks reported significant exposures to troubled US-based asset-backed securities. This sum, however, was not large relative to the banks' capital or relative to China's net assets in foreign exchange. Nevertheless, this case highlights that the internationalisation of an economy's banks poses financial stability risks, quite apart from the internationalisation of the same economy's currency.

Next, we consider the intermediate case in which domestic banks continue to lend in foreign currency. But now, instead of having to borrow outright in foreign currency, domestic banks can swap domestic currency for foreign currency and thereby fund the foreign currency asset. From the standpoint of the counterparty, the exposure to the domestic bank is much reduced. Instead of risking the entire amount, as in an uncollateralised deposit, the foreign counterparty is now exposed to the domestic bank only insofar as the domestic currency received in the swap depreciates against the foreign currency. The implication can be the decline in credit exposure by an order of magnitude.

The implication of this from the standpoint of the domestic authorities is not entirely benign, however. The internationalisation of the domestic currency permits previously strictly domestic banks to enter into foreign currency operations on the basis of domestic liquidity. In other words, smaller, less internationally known and less creditworthy domestic banks can now more readily participate in the risks of lending in major currencies. In principle, this should allow them to diversify away from domestic risks and thereby to build a more robust portfolio of credits. In practice, inexperienced domestic banks may be entering uncharted waters in foreign currency lending and could end up taking on large but uncalculated risks.

#### **4.2 Cross-border lending in domestic currency**

The discussion on the risks of lending in domestic currency can be divided into those posed by domestic banks' international lending in domestic currency and those posed by foreign banks' international lending in domestic currency.

If a wide range of domestic banks can more readily participate in foreign currency lending funded by swaps against domestic currency, an even wider range can participate in international lending that is denominated in domestic currency. An example is the distribution of loans to developing countries across US banks by size in 1982. It should be recalled that the exposure of some of the largest US banks to the risks of these loans was a life-threatening multiple of capital, and that it was on their behalf that extraordinary efforts were exerted by the US and other authorities to keep these loans from

becoming non-performing. Here, however, we concentrate on the generally less threatening exposures of the smaller banks. The reporting by the Controller of the Currency, the Federal Reserve and the Federal Deposit Insurance Corporation reported the exposure to Mexico, Brazil and Argentina of the top nine banks, the next 15 banks and all the rest. While most of the exposure rested in the top nine and the next 15, a substantial exposure remained with the rest of the banks. Most of the last group did not have foreign branches or much involvement with foreign exchange, so if the loans had not been denominated in the US dollar, their participation in these loans would presumably have been less.

The financial stability implication of this broader participation in home-currency lending is two-edged. For a given exposure by US banks to developing countries, the wider syndication of dollar-denominated loans reduced the concentration of holdings in the largest banks and thereby systemic risk. However, the exposure was not given, and arguably the build-up of the stock of risky claims went further because the big banks were able to sell down their exposures to their correspondent banks around the economy. On this view, spreading the foreign loans around the banking system only allowed the emerging markets to borrow more in relation to their underlying cash flows, increasing systemic risk.

Foreign banks' international lending in domestic currency can also raise financial stability issues. In this case, the host central bank that issues the currency may look to the home authorities to deal with any credit losses that threaten the survival of the foreign bank. But the interaction of credit and liquidity difficulties of foreign banks using the home currency may not be so neatly handled by foreign banks' home authorities. In particular, recent events during the global financial crisis of 2007 - 2009 have shown that the Federal Reserve, as issuer of the US dollar and the host central bank, was called upon to provide dollar liquidity to foreign banks, both directly through operations with foreign bank affiliates in the United States, and indirectly through partner central banks.

The backdrop of these operations to provide dollar funding to non-US banks was a large build-up of dollar assets by foreign banks, especially European banks. While some European banks built up retail deposit bases in the United States, most depended on more wholesale sources of dollar funding, including money market funds in the United States (Baba et al (2009)). Through these aggregators of funds, companies and individuals provided funds through both uncollateralised funding, such as certificates of deposit and commercial paper purchases, and collateralised funding in the form of reverse repurchase agreements. In addition to these non-bank sources of funds were outright interbank placements as well as collateralised placements in the form of foreign exchange swaps.

Overall, European banks had built up net claims on non-banks of very large proportions (McGuire and von Peter (2009a,b)). Net dollar claims on non-banks that needed to be funded, much at short maturities, were estimated at \$1 - 1.2 trillion in mid-2007 and \$2 - 2.2 trillion if wholesale funding from money market funds is included. When the banks suffered large losses on their dollar claims after the crisis broke out, they faced great difficulty in rolling over their dollar funding, and had to resort to central bank liquidity support facilities.

As noted, the Federal Reserve used both direct operations with foreign banks and indirect operations involving partner central banks. The New York Second District auction of term funding reached a maximum of \$240 billion in mid-April 2009, much of which was said to have been extended to foreign bank affiliates in New York. In addition, swaps with central banks reached a maximum of \$580 billion in mid-December 2008.

These are extreme but not unprecedented events in the history of the Euromarket. A generation ago, European central bankers considered that any liquidity needs of their banks' operations in US dollars represented a call on their own official reserves. And this was the way various crises played out. For instance, in the Nordic banking crises, the Norwegian and Swedish central banks in effect advanced dollars to their respective banks when they had a hard time rolling over their dollar deposits. And the Japanese authorities were said to have advanced dollars to the Japanese banks in the late 1990s, thereby limiting the "Japan premium" paid by Japanese banks in the international interbank market. And when such support for Korean banks overwhelmed the Korean authorities' capacity in 1997, the Korean authorities resorted to the IMF. In 2007 - 2008, the need was so large and pervasive that the Federal Reserve, as issuing bank of the US dollar, provided unprecedented funding liquidity to foreign banks.

### **4.3 Policy lessons**

What are the financial stability lessons for a central bank standing at the very beginning of the process of internationalisation of its currency? Following the discussion above, three can be identified.

First, to the extent that its domestic banks are already actively engaged in intermediation in dollars (and euros, etc), the domestic banking system is already exposed to important credit and cross-currency liquidity risks. It would be a mistake to overstate the additional risks entailed by the internationalisation of the home currency.

Secondly, the opening of a deep and liquid foreign exchange swap market in the domestic currency will by itself widen these risks to domestic banks that do not possess a deposit base in foreign currency or the credit standing or name recognition to attract wholesale foreign currency deposits. Domestic banking supervision needs to be aware of the potential risks. At a minimum, supervision needs to consolidate risks across currencies. It may be that country risk exposures need to be defined and monitored to prevent undue concentrations in relation to domestic banks' capital.

Thirdly, when borrowing in the domestic currency by the rest of the world becomes possible, it will become even easier for domestic banks to expose themselves to the risks of foreign borrowers. Again, consolidation and in particular the measuring and monitoring of country exposures becomes critical.

Fourthly, in the event that the domestic currency becomes very widely used, it might be necessary to have contingency arrangements to provide funding to foreign banks. These arrangements can take the form of operations directly with them, or facilities to provide the funding to partner central banks. But until such time as the domestic currency is widely used by third parties, such arrangements are probably not a high priority.

In addition to the prudential measures just outlined (consolidation, country risk definition and monitoring in relation to bank capital), there are precedents for the consideration of macro-prudential regulation to check the growth of international lending. Box 3 recalls discussions along these lines in 1979 in Basel that brought together banking supervisors and those charged with following the broad implications of international banking.

### Box 3

#### **Macroprudential policy and the rapid growth of euromarket lending in the 1970s<sup>1</sup>**

Macroprudential regulation is a term that has been in use at the BIS since the late 1970s. It was used in connection with possible policies to respond to concerns over the excessively rapid growth of international lending in the mid- to late-1970s. The G10 Governors gave the Eurocurrency Standing Committee (ECSC, now known as the Committee on the Global Financial System (CGFS)) the task of monitoring the broad risks originating in the offshore markets. At their September 1978 meeting the Governors considered a report from this Committee and agreed that a “joint group of representatives from the Euro-currency Standing Committee and the Cooke Committee [as the Basel Committee on Banking Supervision (BCBS) was then known] ...should consider whether there were ways in which the use of prudential measures might be extended into the macroeconomic field for the purpose of controlling the expansion of international bank credit”.

The background note for this milestone meeting in November 1978 (BIS (1978)) considered the following measures, any one of which could have served to slow the growth of international lending:

- Limiting the international element in banks’ balance sheets, either to a maximum percentage of the balance sheet or to a maximum growth rate in relation to the total balance sheet
- Limiting exposure by economy, for instance, to some percentage of bank capital (e.g. 10%)
- Limiting maturity transformation in foreign currency.

There was little support at the meeting for such limits. Instead there was a consensus for accelerating a supervisory development already in train in the Cooke Committee: consolidation of banks’ accounts on a global basis. In their November 1978 meeting, the Governors had already endorsed this effort as an instrument of banking supervision but it was seen as important from the macroeconomic view as well.

The consensus of the meeting did suggest that more data be collected and published, as a means of informing market participants of the risks that they were collectively running (Larre (1978)). Thus, the Governors were also urged to support gathering and publishing statistics on country risk and maturity transformation. More controversial was the suggestion that the Governors make a joint statement that drew attention to the risks of the narrowing of spreads of syndicated Eurocurrency loans.

Unfortunately, we know that this story did not turn out well. This international lending boom ended in tears for Latin America in August 1982. Consolidated supervision,

mandated processes of country risk analysis, publication of data showing a build-up of short-term debt, even a certain amount of jawboning proved unequal to the task. In the 1980s, heavy infusions of public funds through the International Monetary Fund and multilateral banks allowed major banks to grow out of their claims on developing countries.

Still, a global trend to more and looser international lending had been identified four years before the onset of the crisis, and the central bankers charged with understanding such broad trends in credit and the risk therein (the ECSC) sought to enlist the aid of the bank supervisors in doing something about it. For present purposes, it is worth noting that a generation ago, supervisory tools were being searched for at the international level in order to address a recognised excess of credit.

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<sup>1</sup> This box draws on McCauley (forthcoming, b).

## 5. CONCLUSIONS

We have observed in this paper that offshore markets intermediate a large chunk of financial transactions in major reserve currencies such as the US dollar. This was probably not a historical accident, but reflected the fact that offshore markets play essential economic functions, including a separation of currency risk from country risk and diversification of operational risks associated with the financial infrastructure that provides vital clearing and settlement services for the currency. For emerging market economies that are interested to see a larger share of their international balance sheets being denominated in their own currencies, offshore markets can help to increase the recognition and acceptance of the currency among exporters, importers and investors outside the economy, while still allowing the authorities to retain a measure of control on the pace of capital account liberalisation.

The development of offshore markets could pose risks to monetary and financial stability in the home economy, which need to be prudently managed. Experience in dealing with the Euromarkets by the Federal Reserve and other authorities of the major reserve currency economies show that policy options are available for managing such risks. The lesson to be learnt is that the home authorities need to be alert to such risks, and factor in the additional influence on domestic monetary conditions and financial risks by offshore markets when making monetary and financial policies.

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