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Internationalizing the Renminbi and China's Financial Development Model

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Introduction

The official promotion of the internationalization of the renminbi has no precedent. A currency is internationalized when market participants, residents and nonresidents alike, find it convenient to use a currency outside its home country to denominate bank deposits, loans and bonds, as well as to invoice trade and to exchange against other currencies. It has generally been thought that a currency's wide international use is a market outcome subject to inertia and network externalities ("I use because others use"). Against this view, Eichengreen and Flandreau recall that the Federal Reserve Act's authors sought to promote the U.S. dollar to challenge sterling in international trade and finance, and argue that the dollar surpassed sterling as a reserve currency within fifteen years.[1] However, in contrast to the renminbi, market participants spontaneously used the dollar in banking and bond markets outside the United States, or at most as an unintended consequence of U.S. policy.[2] In particular, the eurodollar market arose in London in the late 1950s as British banks found it convenient to avoid sterling exchange controls, U.S. banks found it useful to avoid regulation at home and central banks eventually found placements in it remunerative compared to similar stateside investments.[3] For their parts, German, Swiss, and Japanese officials long resisted the internationalization of their currencies.[4]

Against advice, the Chinese authorities embarked on the managed internationalization of the renminbi before fully liberalizing China's capital account. More broadly, this managed internationalization occurs at a transitional stage in the financial aspects of China's development model. This stage features a banking system with regulated net interest margin, a tiny participation rate by foreign banks, and window guidance over lending, and a corporate bond market with rationed issuance. Along with capital controls, these reinforce each other and provide the authorities with nonprice tools with which to influence the rate of credit growth and its allocation.

This paper poses the question of the relationship between the managed internationalization of the renminbi, on the one hand, and this transitional stage of financial development and its policy tools, on the other hand. Can the Chinese authorities continue to manage the internationalization of the renminbi within the regime of capital controls and without depriving themselves of the quantitative levers on credit creation and distribution? Or should internationalization be foreseen to remove these controls and unhinge these levers?

The Dual-track Strategy of Financial Development

He and Wang liken the strategy of financial development in China to that followed in the transition from controlled commodity prices to generally liberalized prices.[5] Instead of a big bang, as in Poland, controls remained in place over the medium term for certain quantities of goods, and more flexible market pricing applied at the margin for production beyond those set quantities. In the transition, the market prices increasingly functioned as shadow prices for the controlled quantities.

Thus, by analogy, the authorities continue to set maximum deposit rates in the Chinese banking system, to exercise window guidance on loan growth and to ration access to bond markets. At the same time, interbank rates, commercial paper yields, and corporate bond yields increasingly provide signals of the scarcity of funds. Banks pay heed to these signals when they negotiate liberalized loan spreads with their customers. Over time, the money and bond market yields inform the pricing of bank loans and the two tracks can thereby converge.

This conception can be expanded to include the offshore markets as a third track.[6] Renminbi flow into the offshore market by controlled exchanges into renminbi by Hong Kong residents and by renminbi payments for China's imports in excess of renminbi receipts for China's exports. On this basis, banks and underwriters build offshore foreign exchange, money, and bond markets. In the first instance, the authorities permit relatively narrow channels from (third-track) offshore markets to the (second track) exchange rate, money, and bond markets in China. Offshore price signals differ from those emanating from onshore markets.

On this view, the Chinese authorities do not labor under the misapprehension that the third track can be permanently segmented from the second and first tracks. Instead, offshore prices can complement the domestic market-determined yields in sending signals to the still regulated banking system. The second and third tracks together accelerate the growth of the ambit of flexible prices. If the offshore markets put pressure on the pace of the development of the domestic money and bond markets, this would be welcome—at least within limits.

Internationalization Within Capital Controls

In internationalizing the renminbi within a system of capital controls, the Chinese authorities set out on a path with no signposts. Certainly, pound sterling served in many international roles from the end of the World War II to 1979 under capital controls.[7] Likewise, the U.S. dollar predominated despite capital controls between the mid-1960s and the early 1970s.[8] But these were cases of policy defending established international currencies in a system of fixed exchange rates.

The widespread view that capital controls invariably lose their effectiveness through time makes it necessary to review their current effectiveness in China to establish that capital mobility neither preceded nor accompanied internationalization. Indeed, the issuance of Chinese government debt denominated in renminbi in Hong Kong has performed a marvellous natural experiment. Building on Ma and McCauley, what follows examines spot and forward foreign exchange rates, short-term money market rates, government bond yields, and stock prices for evidence of binding capital controls.[9] In a nutshell, although exchange rates onshore and offshore have achieved some fragile convergence, renminbi interest rates outside China remain well below their onshore counterparts, and Chinese equity prices inside China can distinctly exceed those outside.

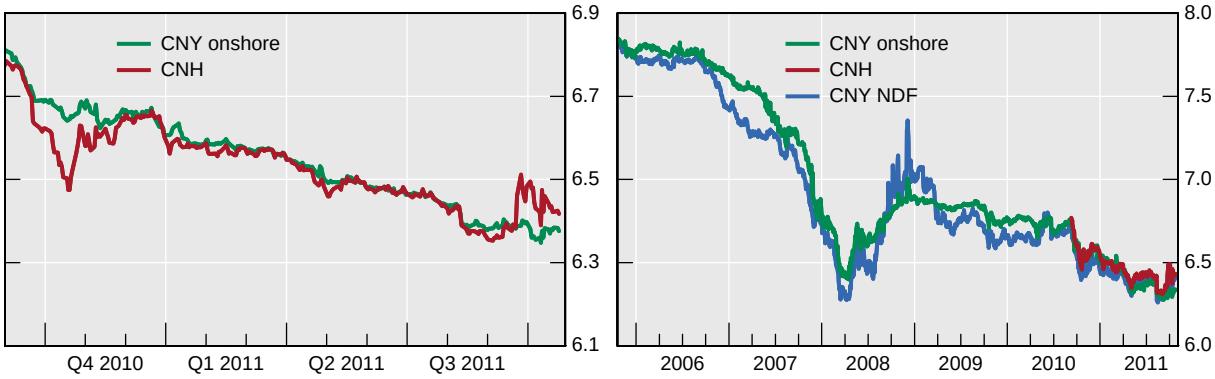
EXCHANGE RATES

The internationalization of the renminbi has resulted in a second spot exchange rate for the renminbi, dubbed the CNH. Until September 2011, the onshore and this new offshore spot exchange rates had settled into a fairly close relationship, with the renminbi a bit more expensive in Hong Kong than in Shanghai. Meanwhile, one-year forward exchange rates had traded fairly closely onshore and offshore, albeit at rates that make sense only in the context of binding capital controls (as discussed in the next section). In September, with heightened risk in global equity markets ("risk off") and associated weakness in Asian currencies against the dollar, the renminbi for the first time traded substantially more cheaply in Hong Kong than in Shanghai. Global financial strains have exposed the limits of arbitrage.

In contrast to the identity of spot exchange rates for major currencies in different financial centres, there are huge differences between spot renminbi exchange rates in Hong Kong and Shanghai. Since its inception in August through late October, the premium on the CNH, relative to the Shanghai fixing, has ranged between -1.9 percent and 2.6 percent and has averaged 0.2 percent in absolute value (Figure 1, left panel). This resembles the gap between the financial and commercial Belgian franc from 1955 to 2002.[10]

Figure 1. Chinese Renminbi/Dollar Exchange Rates, Onshore and Offshore

Spot rates *One-year forward rates*



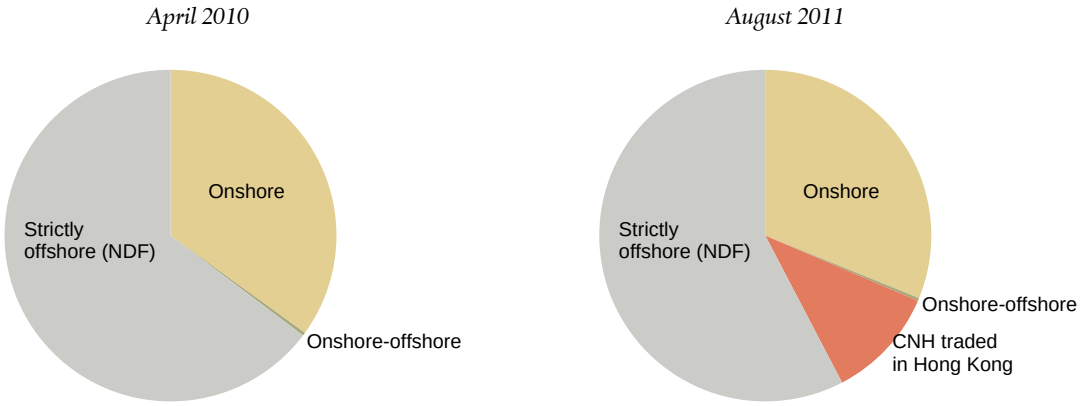
Source: Bloomberg

The introduction of the CNH forward in late 2010 seems to have narrowed the theretofore sizeable gap between onshore and offshore nondeliverable forward (NDF) rates (Figure 1, right panel). From the inception of the onshore forward in October 2005 to the introduction of the CNH forward, the gap between the onshore forward and the offshore NDF rate ranged between -5 percent and 4 percent, and averaged 1 percent in absolute value. During this period, multinational firms arbitraged these two markets within the limits set by China's capital controls. Since the inception of forward trading of the CNH through late October 2011, its price differed from its onshore counterpart and the NDF by no more than plus or minus 2 percent. In this period, the gap between the onshore forward and the NDF narrowed to an average absolute value of 0.4 percent.[11] Again, in September 2011, the forwards in Hong Kong depreciated relative to their Shanghai counterpart, resembling in sign if not extent the pattern after Lehman's 2008 failure.

Trifurcated Renminbi Foreign Exchange Markets: A Transactions Perspective

The text makes clear that, in terms of pricing, the renminbi trades in a trifurcated market; this box complements the text with a transactions perspective. According to the central bank survey of April 2010, the largest share of trading in the renminbi was the $23 billion per day virtual trading of the NDF outside China (Figure A, left panel). The onshore deliverable market in April 2010 reported only $10 billion (though this may have been an undercount). By centres, trading volume was about $10 billion per day on the mainland and in Hong Kong, with another $7 billion/day in Singapore and London, and $3 billion per day in New York. Market estimates for August 2011 put trading offshore in the deliverable renminbi, CNH, at $4 billion per day. If turnover on the mainland and in nondeliverable forwards outside of China are assumed to have continued at the April 2010 rate, then the trifurcation of activity would be as portrayed in Figure A, right panel.

Figure A. Geography of Currency Trading: Estimated Distribution of Renminbi Turnover

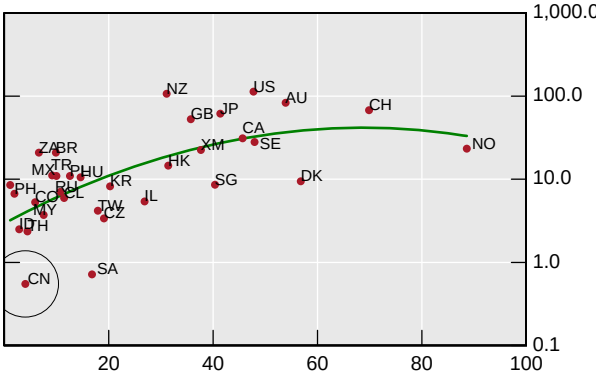


Sources: Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity; HSBC; author's estimates

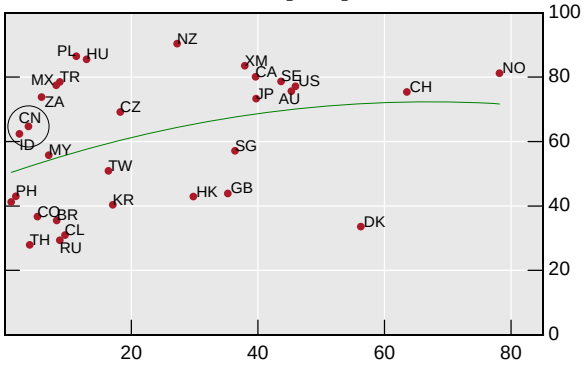
The rapid growth of the CNH could well then be making the renminbi even more of an outlier in the proportion of its trading outside the home country. The cross-section of turnover in the currencies surveyed in April 2010 shows that the renminbi turnover was very low in relation to Chinese current account transactions—foreign exchange turnover, including that in nondeliverable form, was the same order of magnitude as current transactions.[12] Even at China's GDP per capita, this left the renminbi an outlier, with low currency turnover relative to underlying trade (Figure B, left panel). At the same time, the predominance of offshore, nondeliverable trading over domestically reported trading left the renminbi an outlier on the upside in the internationalization of its trading geography (Figure B, right panel). Although the foreign exchange trading of the renminbi was at a very early stage of financialization, it had paradoxically reached a relatively high level of internationalization. And if the CNH market is growing faster than domestic turnover without cannibalizing the NDF market, then the renminbi is becoming even more of an outlier in its internationalization.

Figure B. Financialization and Internationalization of Currencies, April 2010

Ratio of foreign exchange turnover to trade in relation to GDP per capita in 2010[1]



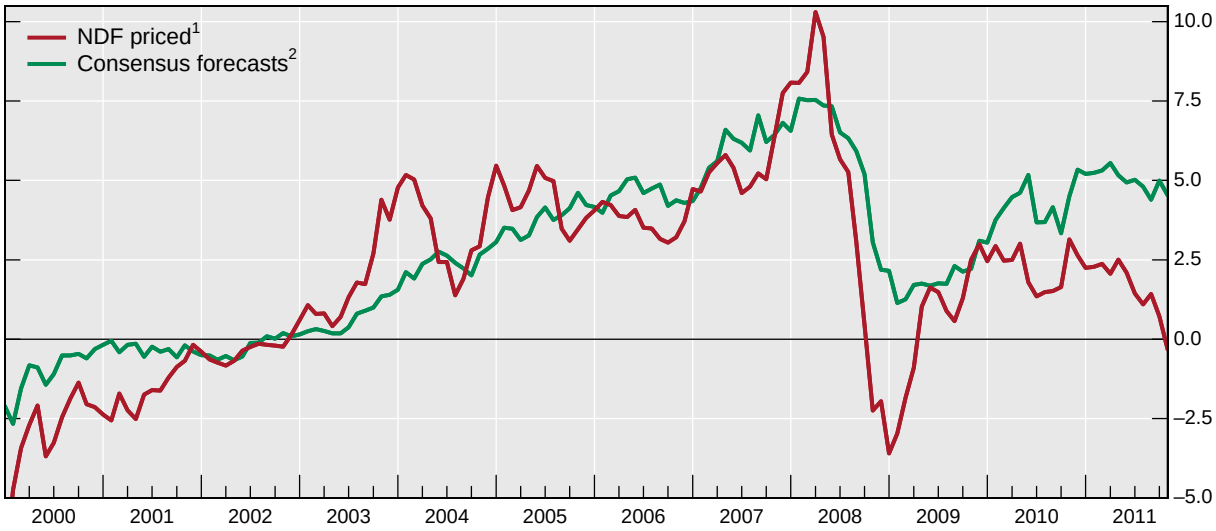
Share of strictly offshore foreign exchange trading in relation to GDP per capita in 2010[2]



1. Horizontal axis: GDP per capita, in thousands of U.S. dollars; vertical axis: ratio of foreign exchange turnover to trade, semi-logarithmic scale. Foreign exchange turnover includes not only over-the-counter but also exchange-traded turnover, which is most significant for the Brazilian real, the Indian rupee, and the Korean won.
2. Horizontal axis: GDP per capita, in thousands of U.S. dollars; vertical axis: strictly offshore percentage of trades as reported by other countries.
Sources: IMF; FOW TRADEdata; Futures Industry Association; Triennial Central Bank Survey of Foreign Exchange

As a result of the availability of the CNH, Paul Mackel and his colleagues claim that the NDF no longer provides an unbiased expectation of the renminbi's future spot rate.[13] Looking at the post-July 2005 evidence on Figure 2, they put a spotlight on the recent sustained gap between survey expectations and the appreciation implied by NDF rates. They infer that the NDFs can no longer serve as a proxy for renminbi expectations by investors, policymakers, and academics.

Figure 2. NDF Premium versus Consensus Forecast of Renminbi Appreciation
Appreciation in the next twelve months



1. Spot rate less one-year forward CNY NDF rate, divided by spot rate.
2. Spot rate less one-year ahead CNY spot rate Consensus forecast, divided by spot rate.
Sources: Bloomberg, Consensus Economics

SHORT-TERM INTEREST RATES

Money-market yield differentials provided the earliest evidence of the segmentation of the onshore and offshore renminbi financial markets. The long-standing criterion for capital mobility is the equality of short-term interest rates in a given currency onshore and offshore.[14] The U.S. dollar and Japanese yen markets had generally passed this test since the early 1980s.[15]

There were two challenges to applying this test to the renminbi. First, unlike the U.S. dollar in London from the 1960s onward, there was until recently no market for deposits of renminbi outside China. Because the renminbi could not be delivered offshore, its interest rate had to be inferred from the offshore NDF. This has traded since around the turn of the century in a fairly liquid market with daily transactions of about $1 billion a day in 2000 rising to $23 billion per day in April 2010. Market participants reflexively back out implied interest rates from forward exchange rates and economists followed suit.[16]

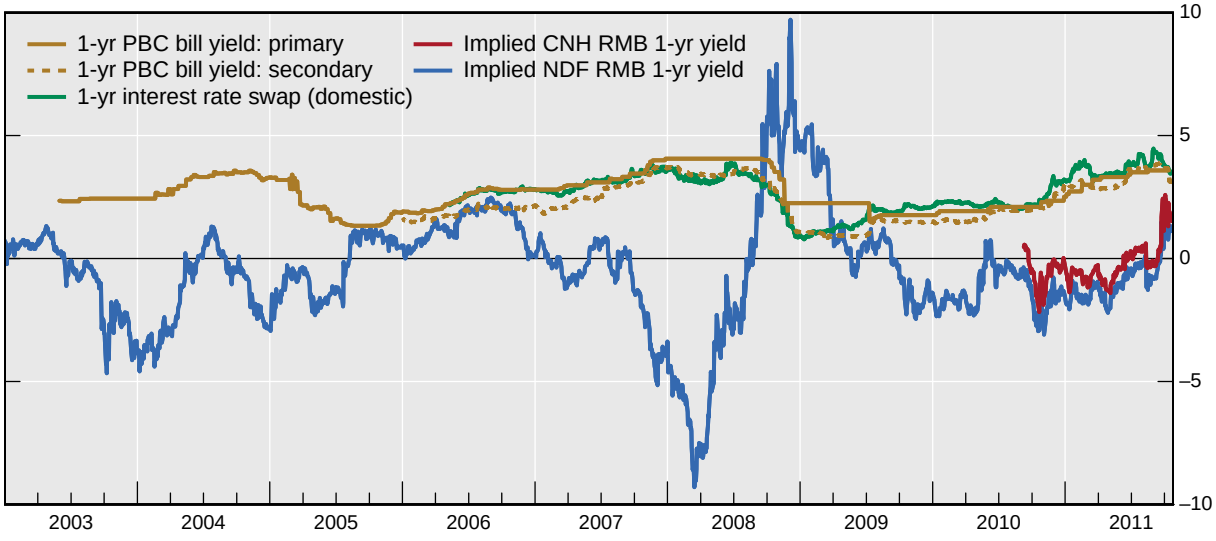
The calculation is straightforward. The ratio of the forward renminbi/dollar rate to the spot rate is taken to be equal to the ratio of one plus the interest rate on renminbi to one plus the interest rate on the dollar. The underlying notion in a complete market setting is arbitrage: If the forward were more expensive than this, one could borrow dollars, buy the other currency spot and deposit the proceeds at interest, in effect producing the forward at lower cost. Under normal circumstances, the relevant global dollar interest rate can be assumed to be U.S. dollar Libor (London interbank offered rate).[17] Given the nondeliverable forward and spot exchange rates and the U.S. dollar Libor of an appropriate maturity, an offshore renminbi yield is implied. In particular, (one plus) the implied renminbi one-year yield is taken as (one plus) one-year U.S. dollar Libor times the ratio of the NDF to the spot. Note that this implied renminbi yield is not bounded by zero. If the NDF trades 5 percent

stronger than the spot (say, at 6.65 rather than 7), and one-year U.S. dollar Libor is 1 percent, then the implied renminbi one-year yield is minus 4 percent.

The second problem to applying the test for capital mobility is an appropriate onshore rate for comparison. Given the developing nature of China's onshore money market the choice is not obvious. Early approaches used seven-day repo rates or three-month interbank rates.[18] Weekly auctions of one-year PBC bills started in 2004, and one-year onshore swap rates go back to May 2006. These provide fairly representative one-year rates in the domestic market.[19] (Evidently the primary market yield on the PBC became unrepresentative in late 2007, and the secondary yield becomes more representative.)

One-year renminbi yields implied by the offshore NDF have often been negative and generally have differed considerably from domestic renminbi yields (Figure 3). The NDF-implied yield has ranged between 13 percent below domestic yields to 8 percent above, and averaged a 3 percent difference in absolute value. These are not subtle differences. The hypothesis of capital mobility is rejected, at least in the period before the Lehman Brothers failure.

Figure 3. One-Year Chinese Renminbi Yields, Onshore and Offshore
In percentages



Sources: Bloomberg, Datastream

GOVERNMENT BOND YIELDS

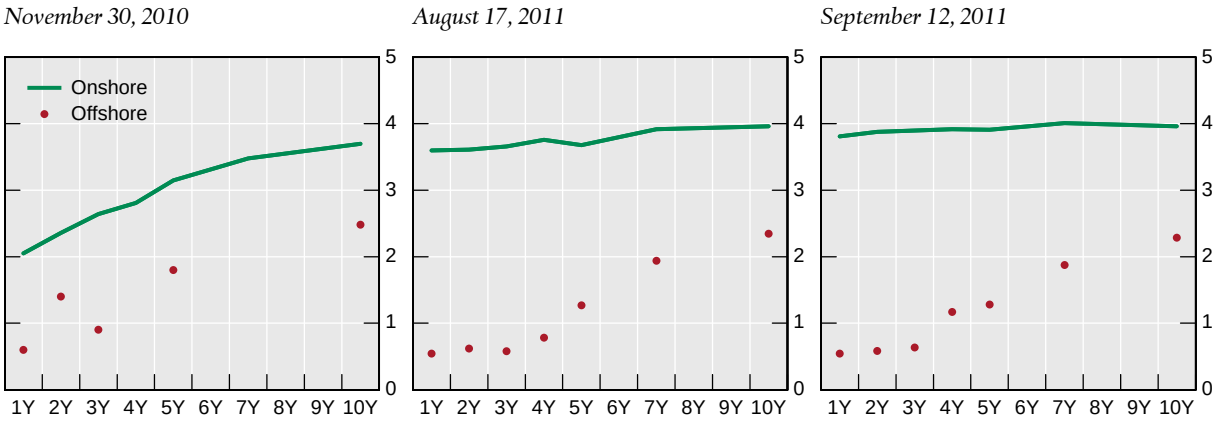
The natural experiment of the sale in Hong Kong of Chinese government bonds has produced fresh and strong evidence of the effective segmentation of the domestic and offshore markets. When the Chinese government issued its bonds in Hong Kong for the first time in 2007, it paid a higher yield than that demanded in domestic markets. However, after the Chinese authorities allowed trade settlement in renminbi, the accelerated build-up of renminbi in Hong Kong led to strong demand for the follow-up issues in November 2010 and August 2011.

The November 30, 2010, issues at the one-, three-, five-, and ten-year maturities all came in well below the domestic yield curve (Figure 4, left panel). The Chinese government saved an average of 144 basis points on the four-part offering. In other words, investors in Hong Kong were willing to

pay a premium over what investors on the mainland were paying for given renminbi cash flow obligations of the Chinese government.

Figure 4. Chinese Government Renminbi Bond Yields, Onshore and Offshore

In percentages



Source: Bloomberg

On August 17, 2011, the Chinese government repeated the experiment with much the same results. This time the Ministry of Finance offered bonds at the three-, five-, seven-, and ten-year maturities. Spreads to onshore equivalents again were widest at the short end: 316 basis points, 241 basis points, 200 basis points and 171 basis points (Figure 4, center panel), for a weighted average of 258 basis points. Again, this spread conveys a clear message that Hong Kong residents are willing to pay substantially more than mainland investors for identical promised cash flows from the Chinese government.

Such observations are not confined to the primary market. On a recent day, the Hong Kong traded bonds of the Ministry of Finance traded to yield considerably less than similar bonds in Shanghai (Figure 4, right panel).[20]

Lower yields in Hong Kong mean a premium price that creates a vulnerability to policy changes and as a result the yield gap between onshore and offshore traded Chinese government bonds narrows with longer maturities. If the Chinese authorities remove or compromise the restrictions that support premium pricing in Hong Kong, investors there could see yields rise and prices decline to onshore levels. For a given yield spread, the longer the maturity of the offshore bond, the larger the potential policy-induced price decline. Whatever the exchange rate view, longer maturity offshore bonds need to price in the risk of yield convergence over the life of the bond.[21]

STOCK PRICES

The pricing of identical shares listed in domestic and foreign stock exchanges can provide clear evidence of the existence and efficacy of capital controls.[22] In another, more long-standing, natural experiment, the Chinese authorities have allowed many firms to list shares both on the mainland (so-called A shares) and in Hong Kong (so-called H shares). The Hang Sent AH shares index measures the ratio of the price of a basket of shares in Shanghai relative to the price of the basket of identical shares in Hong Kong, with a reading of one indicating on average identical pricing.[23]

This index has ranged widely (Figure 5). From a range of around one in 2006, the price of mainland-listed shares rose to twice the level of their Hong Kong-listed counterparts at the end of 2007. In the past year or so, pricing at near parity has unevenly prevailed until quite recently when domestically traded shares again rose to a premium over Hong Kong–traded shares.

Figure 5. Chinese Firms' Stock Prices, Onshore Relative to Offshore

Source: Bloomberg

In summary, the Chinese authorities are managing the internationalization of the renminbi within a regime of effective capital controls. At the same time, renminbi internationalization inevitably provides new means to work around these controls. More generally, the internationalization has a problematic relationship to the Chinese financial development model that puts in the hands of the authorities levers on deposit rates and quantities of credit.

THE FLOW OF FUNDS BETWEEN OFFSHORE AND ONSHORE

Although capital controls remain in place, steps toward renminbi internationalization must be understood to have punched new holes in the capital controls. This is not the first time, of course, that the Chinese authorities have punched such holes. The Qualified Foreign Institutional Investor (QFII) scheme has for some years allowed certain foreign investors access to mainland equity markets.

Since 2003, Hong Kong residents have been permitted to buy renminbi up to a daily limit. Banks selling renminbi against dollars or Hong Kong dollars could square through the Bank of China Hong Kong their position in the interbank foreign exchange market in Shanghai. This produced offshore liabilities in renminbi. Originally, the corresponding assets were solely deposited into an account at the Bank of China Hong Kong, whence they were placed in an account at the People's Bank of China Shenzhen branch. The latter paid the rate of remuneration that applies to excess reserves of banks in China, which set the effective limit for deposit rates in Hong Kong. Thus, in the first instance, the counterpart to offshore renminbi deposits was an increase in the net foreign currency assets of the Chinese banking system in general and China's foreign reserves in particular (Table 1, red arrows).

Table 1. Renminbi Consolidated Monetary Survey

	Assets	Liabilities
Onshore	Net foreign currency assets (including official foreign reserves) ↑	Onshore M2
	RMB credit by onshore banks	Bank bonds held by nonbanks
Offshore	RMB credit by offshore banks ↑	Offshore RMB deposits ↑ ↑

Source: Author's adaptation of He, "International Use of the Renminbi."

In addition to holding bank accounts, Hong Kong investors from 2007 could also buy bonds sold offshore. These offered yields above those on bank deposits but below those on equivalent bonds sold on the mainland. When the proceeds were remitted to the mainland, they had to be approved by the SAFE, just as dollars to be exchanged for renminbi are subject to approval.

Each step posed challenges to the Chinese authorities. The creation of the renminbi deposit in Hong Kong added to the growth of official foreign exchange reserves at a time of rapid growth. Although the incremental amounts might be regarded as not material, the additional reserve growth cannot be considered as solving a problem for the central bank.

Moreover, the inward remittance of the heretofore offshore renminbi added to the sums that needed to be sterilized. The reflow of renminbi to the mainland would result in a rise in bank reserves as the special deposit at the Shenzhen branch was debited and an ordinary reserve account of a mainland bank was credited. At this stage, the renminbi would have to be included in the normal sterilization operations of the central bank, through sale of open market paper or higher required reserves.[24] Again the amounts might be regarded as not material, but any addition to base money cannot be considered as solving a problem for the central bank.

Starting in 2009, cross-border payments were permitted for trade and net renminbi flows arising from this source have the same separate effects of reserve growth and potential base money growth. For ease of exposition, consider simply an import into the mainland paid for with renminbi transferred to a bank in Hong Kong. Without the possibility for such a payment, the import would have been paid for by dollars ultimately obtained from the central bank (or by dollars that reduced the flow of net dollar purchases by the central bank that month). Instead, a payment is made in renminbi, and the central bank thereby ends the month with more dollars. To the extent that the renminbi flows back to the PBC branch in Shenzhen, there is no need to sterilize. But if a mainland-related issuer sells a bond and remits the renminbi onshore, or if banks in Hong Kong are allowed to invest in the interbank market for Chinese government bonds on the mainland, at that stage the funds add to the monetary base and need to be included in the central bank's sterilization operations.[25]

In sum, following the flow of funds highlights the two challenges that the increase in renminbi offshore through these channels poses. First, they correspond to an increase in official foreign exchange reserves, increasing the long foreign exchange position of the government and its associated valuation and investment risks. Second, any reflow of renminbi onto the mainland adds to the sums that need to be sterilized by the central bank. In managing the internationalization of the

renminbi, the Chinese authorities must be looking to benefit over the medium and long term, because the short-term effects only add to current policy challenges.

The renminbi circulation can in several respects be characterized as persistently lopsided.[26] In the first instance, Hong Kong banks could offer renminbi deposits but could not extend renminbi credit. Second, once trade was allowed to be settled in renminbi, Chinese imports settled in renminbi exceeded Chinese exports settled in renmibi by a wide margin, leading to a net build-up of renminbi offshore. Third, in the so-called dim sum bond market, residents of China and Chinese-owned entities predominate (see below): few borrowers without assets on the mainland want to borrow renminbi. And fourth, once offshore renminbi loans were permitted, there was little demand for them. In particular, Hong Kong deposits of renminbi at 550 billion ($86 billion) at the end of June 2011 tower over loans at CNY 11 billion ($1.7 billion)—a 50:1 ratio.[27] Thus, while originally the deposits at the PBC Shenzhen branch precluded renminbi credit extension offshore (in effect, a 100 percent reserve requirement), lack of demand now keeps bank loans in renminbi tiny relative to the deposit base.

A more balanced evolution of offshore renminbi banking could generate assets and liabilities offshore without adding to official foreign exchange reserves. The green arrows in Table 1 show this possibility. Loans could be extended offshore to non-Chinese and non-Chinese would be happy to hang on to the offshore renminbi bank deposit. In some ways, this would be the ideal development path, allowing the renminbi to become internationally used without adding to money and credit in China.

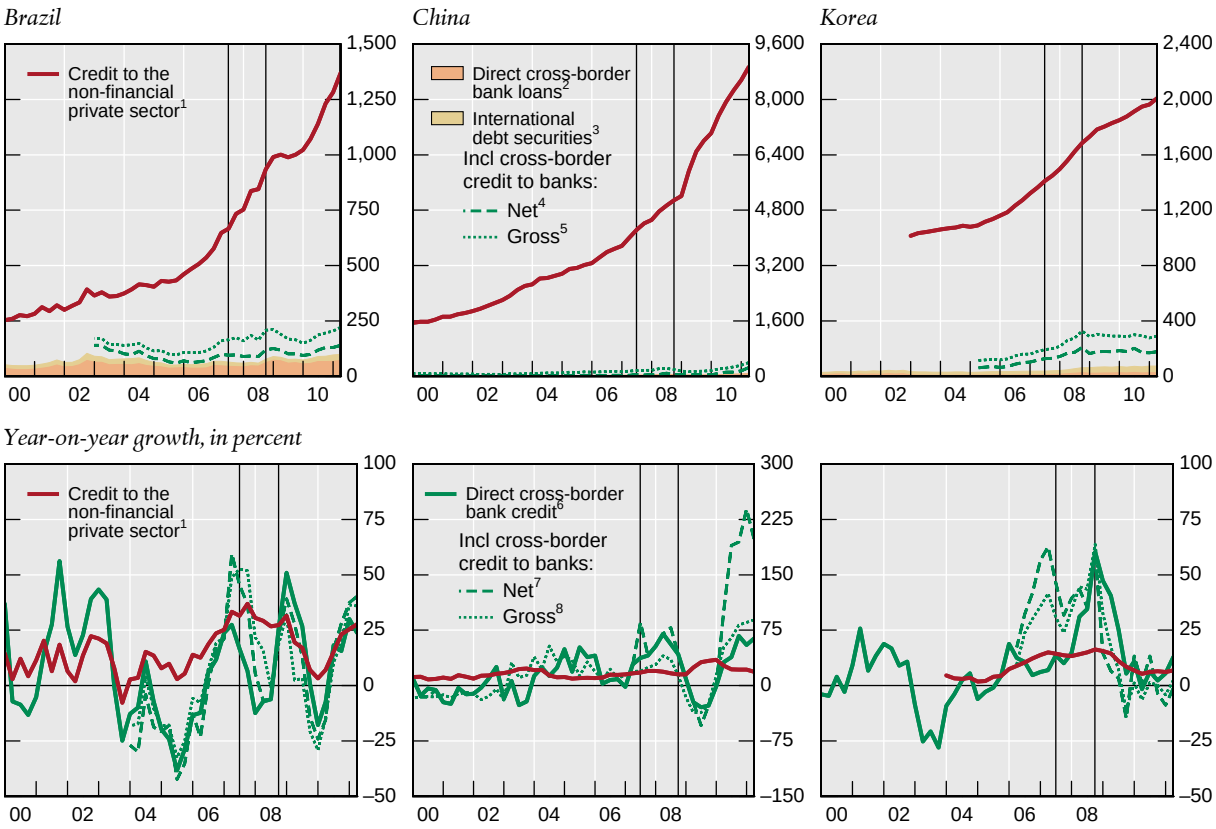
But reality is not likely to follow this path.[28] The next section draws on evidence from the offshore markets in major currencies to outline the challenges that the Chinese authorities will face as the renminbi offshore market becomes less lopsided.

Prospective Challenges of Renminbi Internationalization

Looking forward, the development of the renminbi's offshore market can be expected to pose challenges to China's financial development model. One of the consequences of this model is that hardly any credit is extended to Chinese borrowers across the border, in visible contrast to the situation in, say, Brazil and Korea (Figure 6).[29]

Figure 6. Credit to the Nonfinancial Private Sector in Selected Emerging Economies

Stocks at constant end-Q1 2011 exchange rates, in billions of U.S. dollars



The vertical lines indicate end-Q2 2007 and end-Q3 2008.

1. For Korea, total liabilities of nonfinancial private sector borrowers, as reported in the flow of funds statistics. For others, domestic credit to nonfinancial private sector borrowers plus cross-border loans to nonbanks (that is, includes loans to nonbank financial entities) plus issues of international debt securities by nonfinancial private sector borrowers in the country. 2. BIS reporting banks' direct cross-border loans to nonbanks (that is, includes loans to nonbank financial entities). 3. Issues of international debt securities by nonfinancial private sector residents of the country. 4. BIS reporting banks' net cross-border claims on banks in the country plus direct cross-border bank loans (orange shaded area) plus outstanding international debt securities (tan shaded area). 5. BIS reporting banks' gross cross-border claims on banks in the country are used. 6. Sum of cross-border loans and international debt securities outstanding. 7. Including net cross-border borrowing (if positive) by banks in the country, on the assumption that this cross-border credit is passed on to nonbanks in the country. 8. Including gross cross-border borrowing by banks in the country.

Sources: IMF, *International Financial Statistics;* BIS locational banking statistics; BIS international debt securities statistics.

Already, Chinese firms are selling renminbi bonds offshore and ready access to such funding could undermine the domestic rationing of bond market access and accelerate large Chinese firms' exit from the banking system. Eventually, banks will forge strong links between the offshore interbank market in renminbi and the domestic interbank market, challenging monetary and credit control. In the longer term, firms in China will borrow from non-Chinese banks located outside the mainland, and this will challenge not only monetary and credit control but also the predominance of Chinese owned banks in the overall credit system.

In what follows, we take up the issue of non-Chinese and Chinese obligors selling renminbi bonds offshore, the forging of strong interbank links between the renminbi market on the mainland and offshore, and direct borrowing by Chinese firms from banks located outside the mainland. In each case, we draw on the evidence of existing offshore markets to infer possible trajectories and implications of renminbi internationalization.

OFFSHORE BOND MARKET DEVELOPMENT

The current dearth of non-Chinese issuers of renminbi bonds offshore, despite low interest rates, points to a sense of two-way risk on the exchange rate as an absent but necessary condition for the development of the market. At the same time, offshore issuance of renminbi bonds by Chinese borrowers poses risks to the rationing of bond market access onshore and thereby to the dominance of the regulated banking system in Chinese corporate finances.

Non-Chinese Issuers

If it follows the pattern of development of offshore markets in major currencies, the renminbi offshore bond market will diversify away from Chinese nationals as issuers. So far, the overwhelming majority of issuers of renmiinbi bonds in Hong Kong have plans to use the proceeds on the mainland. The question for these issuers is not whether we want to borrow in renminbi, but rather whether we want to cheapen our debt in renminbi—a question that answers itself. Just as issuing a bond in China can cheapen corporate debt costs relative to borrowing from a bank at a regulated rate, so too issuing a bond offshore can cheapen debt costs relative to a domestic bond issue. The constraint is not the issuance of a bond in Hong Kong per se, but rather the remittance of the proceeds onto the mainland. SAFE approval is required, just like bringing in dollars.[30]

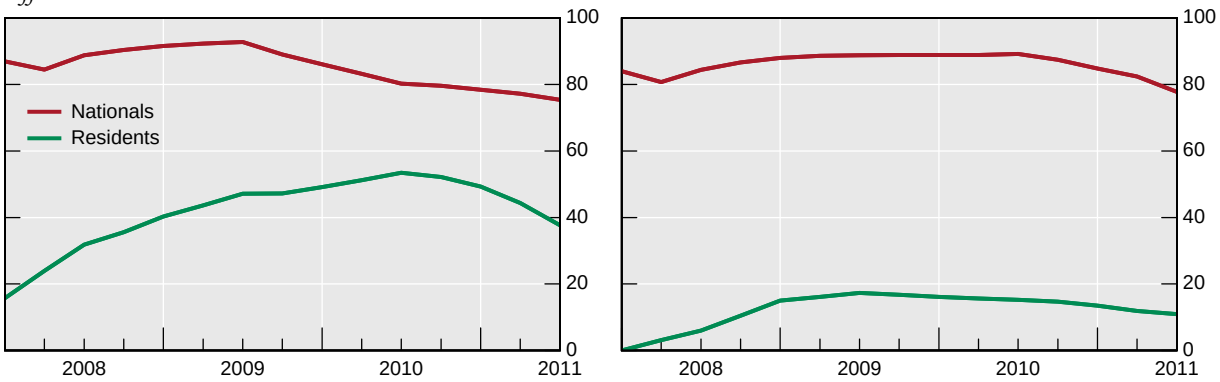
This degree of dominance of issuers of the currency's home nationality is an unusual observation in offshore markets (Figure 7). Where 80 percent of renminbi issuers are of Chinese nationality, 30 to 60 percent of all issuers in other offshore markets are nationals of the country of issue of the currency. Only for nonfinancial isssuers is the high fraction of Chinese issuers in the offshore renminbi market in line with the international norm.[31]

Figure 7. Offshore Bonds and Notes Issued by Onshore Nationals and Residents[1]

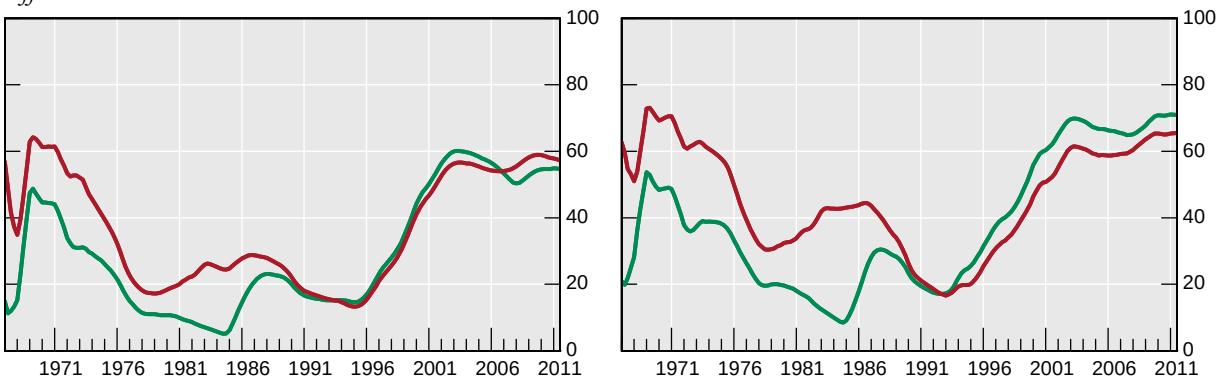
In percentages, four-quarter moving averages

All sectors | *Nonfinancial sector*

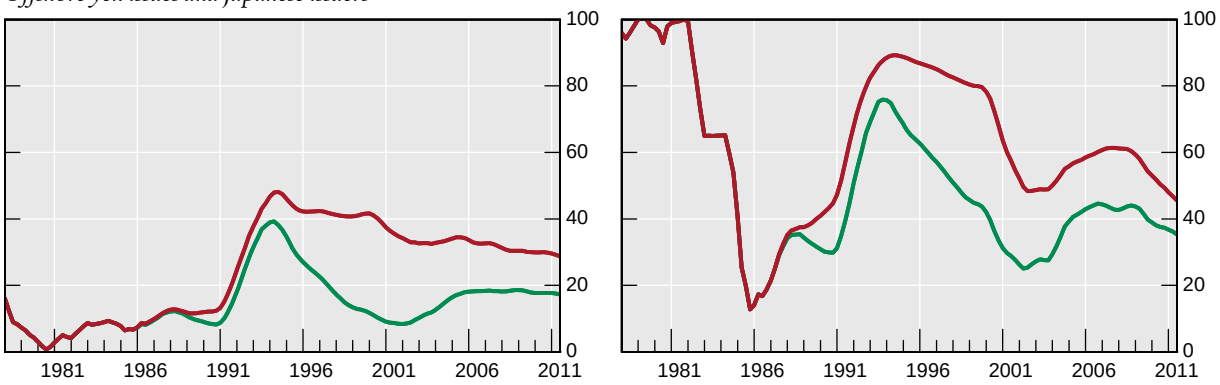
Offshore renminbi issuers and Chinese issuers



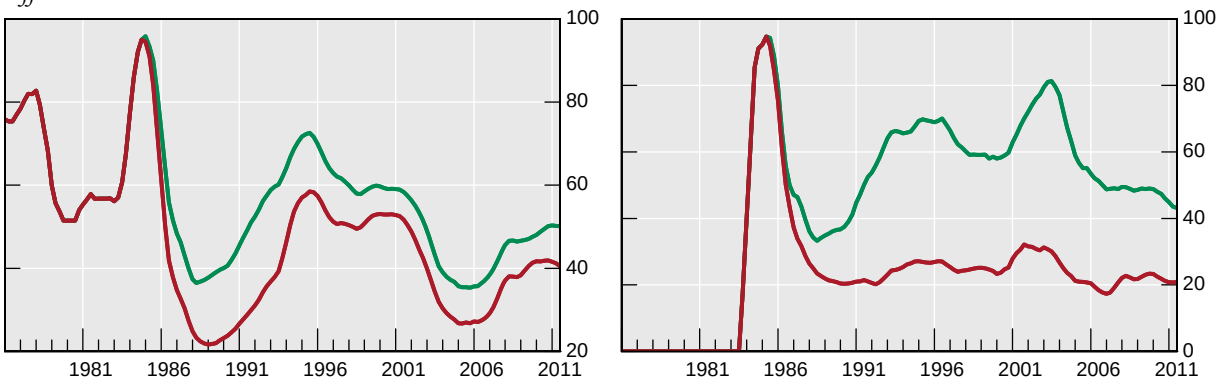
Offshore dollar issuers and U.S. issuers



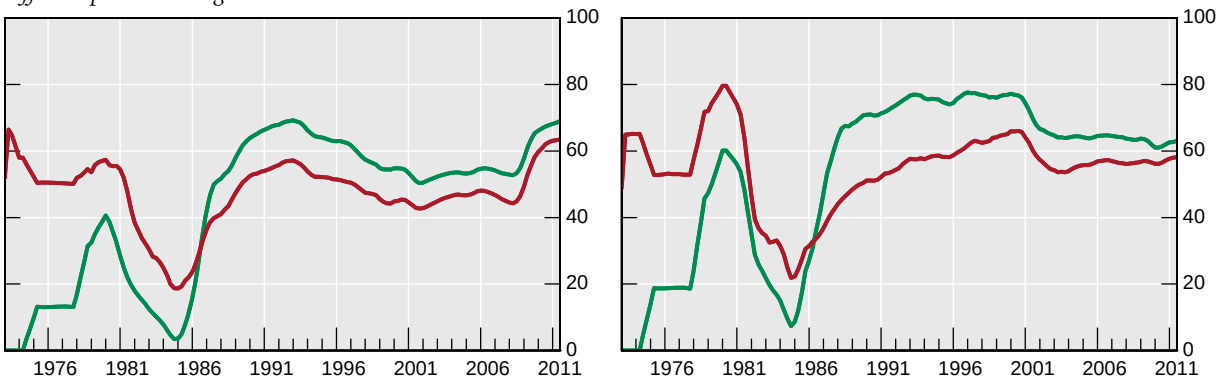
Offshore yen issues and Japanese issuers



Offshore Australian dollar issuers and Australian issuers



Offshore pound sterling issuers and UK issuers



1. Offshore = Total international bonds and medium-term notes less their foreign issues. Prior to 1993, only bonds. "Foreign issues" are "domestic currency issues in a domestic market by non-residents (e.g., yankee and samurai), and all other international issues." Bank for International Settlements, *Guide to the International Financial Statistics*, BIS Papers No. 14 (revised), July 2009, p. 22, http://www.bis.org/statistics/intfinstatsguide.pdf.
Source: BIS Securities statistics.

As a correlate of the lack of non-Chinese renminbi bond issuers, the quality distribution of issuers of dim sum bonds includes an unusual fraction of low-rated issuers. The median rating of renminbi bonds sold in Hong Kong is A, but 7 percent by number and 17 percent by amount carried ratings below investment grade at issue. In contrast to the high quality of issuers in other offshore markets,[32] the unsatisfied demand for offshore renminbi bonds is allowing weak credits to issue bonds.

One of the main inhibitions on firms and governments outside China borrowing renminbi is the concern that, even at low interest rates, it is risky to borrow in a currency that is widely anticipated to appreciate. Obligors outside China will take on renminbi liabilities and hold them without hedging them when they perceive a two-way risk in the exchange rate. However, the recent weakness of the CNH suggests that this could change quickly.

As argued in Cheung et al., one of the payoffs to China of renminbi internationalization will be the sharing of exchange risk—the short renminbi, long foreign currency risk—that is currently held by Chinese investors in general and the government in particular.[33] This ultimately requires that firms and governments in the rest of the world accept to undertake and leave unhedged (except by trade flows) renminbi obligations. For the internationalization of the renminbi to succeed as a device for international risk diversification, the issuance of renminbi bonds offshore must become more balanced.

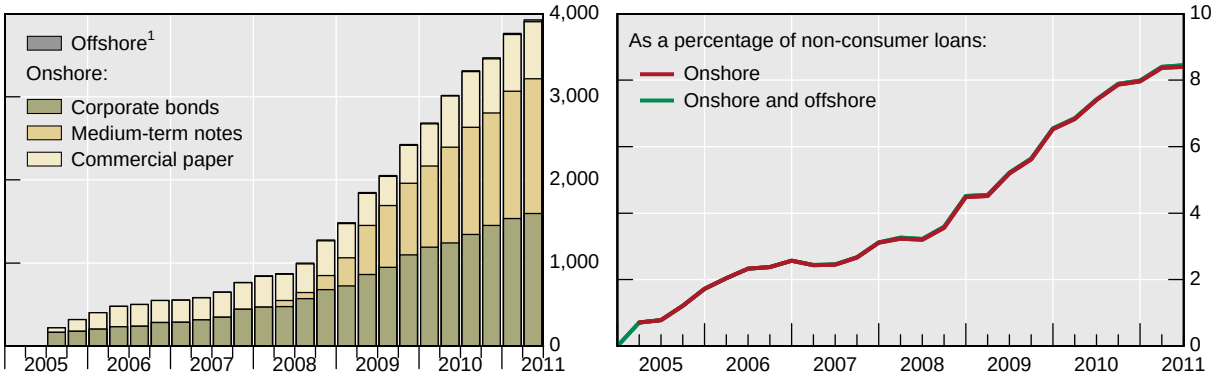
Chinese Issuers

A challenge to domestic credit control could arise from a combination of a strong demand for renminbi bonds offshore and a regime allowing renminbi to be readily brought back into China. At present, offshore issuance is not constrained directly, but the repatriation of the funds onshore is a constraint. Offshore issuance thus remains small in relation to the domestic bond market in China, which itself remains small in relation to bank debt (Figure 8). By contrast, the international dollar bond market is important to U.S. firms, and their bond debt well exceeds their outstanding bank and other loans.

Figure 8.

Debt Securities of Chinese Nonfinancial Corporations in Renminbi

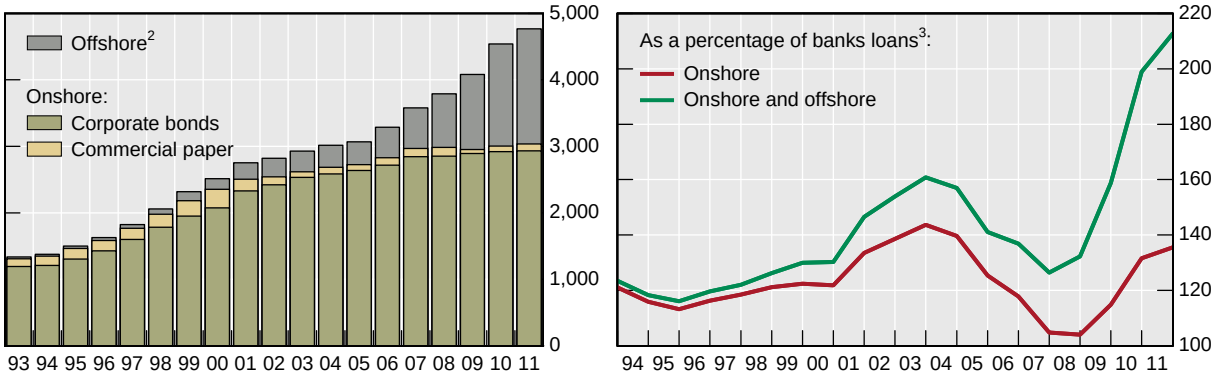
In billions of RMB | *In percentages*



1. International corporate RMB debt securities issued by Chinese nationals.
Sources: BIS Securities Statistics; U.S. Flow of Funds Statistics.

Debt Securities of U.S. Nonfinancial Corporations in U.S. Dollars

In billions of U.S. dollars | *In percentages*



1. International corporate U.S. dollar bonds and notes issued by U.S. residents (corporate issuers as an immediate business sector).
2. Sum of bank loans, other loans and advances, and mortgages.
Source: BIS securities statistics; CEIC.

Moreover, given more cross-border capital mobility, the prospect of firms selling bonds offshore could spur an accelerated liberalization of the domestic bond market that could see the banks lose their best borrowers in a few short years. In Japan, the liberalization of the foreign exchange market in 1980 and 1984 and of the euroyen market in 1984 allowed heavy use of the offshore market from the mid-1980s.[34] This in turn spurred domestic bond market liberalization. After losing their big corporate borrowers, the big Japanese banks tried to reinvent themselves as lenders to small- and medium-sized enterprises that had real estate collateral, with disastrous results.

All this highlights how the development of the offshore renminbi market leaves the domestic bond market vulnerable to easier cross-border flows of renminbi. Of course, a similar statement can be made about cross-border flows of dollars. If Chinese companies could sell U.S. dollar bonds and remit the proceeds freely into China, such issuance would explode. The development of the offshore renminbi bond market implies that incremental easing of cross-border flows would present Chinese firms a choice between borrowing in dollars and borrowing in renminbi.

OFFSHORE-ONSHORE LINKAGES IN BANKING MARKETS

Offshore banking in the renminbi will not always be isolated from banking markets on the mainland, and the eventual interactions will pose policy challenges. At present, renminbi in Hong Kong banks can flow back to the mainland through only a few channels: the trade channel (as payment for exports from the mainland), the monetary channel (as a deposit in the PBC branch in Shenzhen), or capital channels (as an authorized remittance by an issuer of a dim sum bond or as an authorized investment in the interbank market for Chinese government bonds). The existing claims of offshore banks on Chinese banks and nonbanks—which are unusually small in relation to domestic credit (Figure 6)—are denominated in dollars and other currencies.

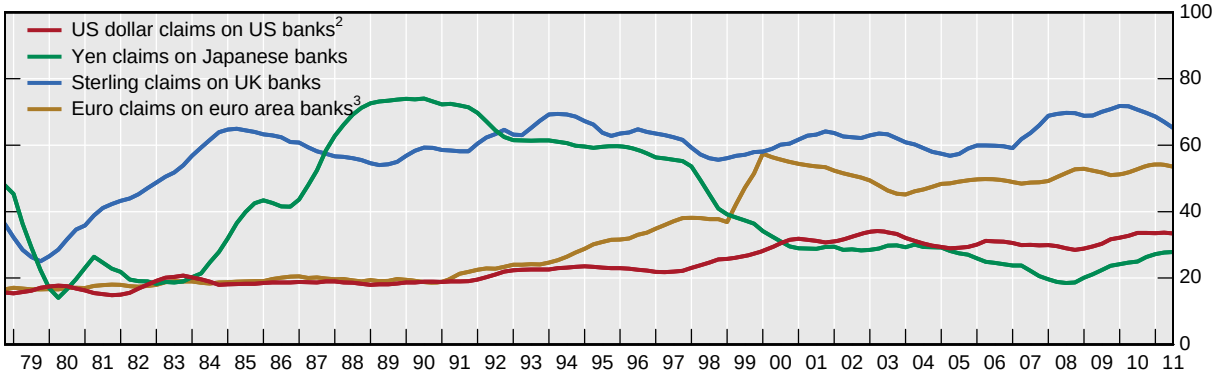
At some stage, cross-border markets will link banks outside of the mainland to mainland banks and firms. The records of the global banking markets in dollar, Deutsche mark/euro, yen, and sterling all make clear that offshore banks end up holding substantial stakes in the banks and nonbanks of the home country of the currency. And the growth and fluctuations of these stakes have posed policy challenges elsewhere to authorities used to working with regulated deposit rates, reserve requirements and domestic banks.

Cross-border Interbank Market in Renminbi

At some stage, banks outside the mainland will lend in renminbi directly to banks in China.[35] For example, dollar claims on banks in the United States booked at banks located outside the United States have risen from less than one-fifth to more than one-third of overall dollar interbank claims booked outside the United States (Figure 9, red line). The share of offshore interbank claims on banks in the United States lies between the counterpart ratios for the other currencies, higher for sterling and euro, and lower for the yen. Eventually, a good part of the renminbi offshore assets should be expected to be claims on Chinese residents.

Figure 9. Share of Offshore Interbank Claims on Banks of Currency Home Country[1]

In percentages



1. Total positions.
2. Ratio for the U.S. dollar for quarters before Q4 1983 is adjusted upward to reflect estimates for the Bahamas and Cayman Islands which started to report their positions in that quarter.
3. Prior to 1999, Deutsche mark claims on German banks.

Source: BIS locational banking statistics by residence.

The inflow of funds from the eurodollar market the United States faced in 1969 is instructive.[36] With inflation rising toward 5 or 6 percent, the Federal Reserve was raising interest rates to 10 percent. As Treasury bill and other money market yields approached the (Regulation Q) ceilings on deposit rates, banks suffered a run-off of interest-sensitive certificates of deposit (CDs)—*disintermediation*. Under usual circumstances, banks would cut back on the supply of credit. But in the dozen years of its exisitence, the eurodollar market had developed such that large U.S. banks could attract deposits there and bring the funds into the United States to replace the lost CDs.

Federal Open Market Committee members were surprised at how elastic a source of funds the offshore dollar market had become. President Hayes of the Federal Reserve Bank of New York worried in February about the consequences of a "drying up of the supply of Euro-dollars."[37] However, at the September 9 meeting, Axelrod, staff director for the division of monetary affairs, reported this:[38]

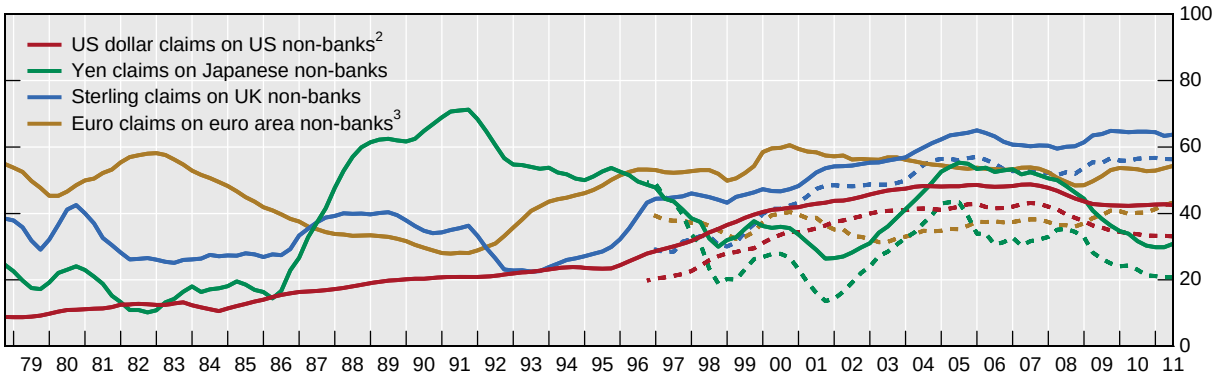
> In early December 1968, when outstanding CDs of New York banks, for example, were at their peak of $7.5 billion, they represented 10 percent of total assets of these banks. At present, these banks have only about $2 billion of CDs left; and these finance only about 2.75 percent of total assets. It is interesting to note that the corresponding build-up in Euro-dollar borrowings has brought such liabilities of New York banks to a total now of over $10.5 billion, representing a little more than 13.5 percent of the total assets—a doubling since December.

An inflow of 6 to 7 percent of the assets of the large Chinese commercial banks in eight months would be quite a large sum. Policymakers can (and did) resort to reserve requirements on funding from the eurodollar market.[39] These, however, could sharpen the incentives for direct cross-border lending to nonbanks in renminbi, as discussed in the next section.

Direct Cross-border Lending to Nonbanks in Renminbi

Over the medium to long term, direct renminbi credit to firms in China extended by banks outside the mainland can be expected to put at risk some of the policy levers of the authorities. In particular, the offshore markets in dollar, euro, yen, and sterling direct 20 to 40 percent of their credit to borrowers in the currency's home country. For example, dollar claims on U.S. residents booked by banks outside the United States started out as a small proportion of overall dollar claims booked outside the United States but rose over a generation to approach one half (Figure 10, red line).[40] The share of offshore claims on (and loans to) U.S. residents lies between the counterpart ratios for the other currencies, higher for sterling and euro, and lower in recent years for the yen. Eventually, a good part of the renminbi offshore assets should be expected to be claims on Chinese residents.

Figure 10. Share of Offshore Bank Claims on Nonbanks of Currency Home Country[1]
In percentages



1. Total positions in solid lines, loans and deposits in dashed lines.
2. Ratio for the U.S. dollar for quarters before Q4 1983 are adjusted upward to reflect estimates for offshore centers that started to report their positions in that quarter.
3. Prior to 1999, Deutsche mark claims on German nonbanks.
Source: BIS locational banking statistics by residence.

Such renminbi credit poses manifold policy challenges. Offshore loans can be priced below minimum regulated loan rates, especially if their funding escapes reserve requirements. (The cost of the PBC's reserve requirements per renminbi of required reserve is not so high, given the practice of remunerating them, but the level of required reserves is high.[41]) The authorities may encounter difficulty in measuring such credit, even with authorization or registration requirements. If, as can be expected, non-Chinese banks engage in this direct cross-border lending disproportionately, especially if they can arbitrage regulatory costs arising from reserve requirements, the foreign bank share of bank credit to Chinese residents (currently 2 percent) can be expected to rise.[42] By allowing foreign banks to raise their market share in China, direct cross-border lending will also put pressure on the workings of window guidance as a tool for the authorities to influence credit growth.

The Bank of Japan's window guidance ran into problems in the late 1980s under a liberalized capital account.[43] The proportion of offshore yen claims on Japanese residents rose in the late 1980s from around 20 percent to 60 percent as the Bank of Japan guided banks to restrict domestic yen lending (Figure 10). (At the same time, lending in dollars within Japan and from Japanese bank branches in Hong Kong also increased sharply.[44])

Conclusions

The growing use of the renminbi has a complex relationship to capital controls in China. The project in itself represents an exception to capital controls and the build-up of renminbi deposits has further raised China's official foreign exchange reserves. Yet capital controls remain effective. Moreover, their effectiveness allows the Chinese authorities to enforce ceilings on deposit rates, to keep the foreign bank share low and to guide bank lending quantities, as well as to ration access to the bond market.

This paper argues that established offshore markets provide significant credit to borrowers in the home country of the currency. This is already the direction of the offshore renminbi bond market. (Indeed, its more balanced development requires willing non-Chinese borrowers.) At this stage, border controls on renminbi inflows limit the impact of the offshore renminbi bond market on domestic bond market rationing, and more generally the balance between bank credit and securities market credit.

As for offshore renminbi banking, judging from established offshore markets, it can be expected to evolve beyond non-Chinese deposits being used to fund non-Chinese borrowers. Drawing on international experience, flows of renminbi credit into China through the interbank and direct cross-border lending channels will present challenges to the control of money and credit in China. Extension of reserve requirements to renminbi interbank inflows can be expected but these will increase the opportunities for foreign banks to lend directly to Chinese firms from offshore.

All in all, the internationalization of the renminbi can provide a parallel track of pricing for foreign exchange, money, and bond markets. This track will help diminish the importance of regulated financial prices, and, alongside its domestic counterpart, inform their setting where flexibility is permitted. The more that offshore renminbi are given a passport to enter the mainland freely, the more prices in the offshore market will matter. In the process of easing capital controls, a preferential passport for renminbi to enter the domestic economy could usefully lessen the risk of foreign currency borrowing.

Endnotes

1. Barry Eichengreen and Marc Flandreau, "The Federal Reserve, the Bank of England and the Rise of the Dollar as an International Currency, 1914–39," BIS Working Paper No. 328, November 2010.
2. Robert Aliber likens offshore markets for a currency to offshore radio stations, which are not subject to domestic regulations regarding for instance, signal strength or commercial share of airtime. See *The New International Money Game* (Chicago: University of Chicago Press, 2002).
3. Catherine Schenk, "The Origins of the Eurodollar Market in London," *Explorations in Economic History*, vol. 35, 1998; Robert McCauley, "Distinguishing Global Dollar Reserves from Official Holdings in the United States," *BIS Quarterly Review*, September 2005.
4. See Gunter Franke, "The Bundesbank and the Financial Markets," in Caroline Fohlin, ed., *Fifty Years of the Deutsche Mark* (Oxford: Oxford University Press, 1999), pp. 246–48; McCauley, "Distinguishing Global Dollar Reserves," pp. 165–66; Guido Boller, "Phasing Out Direct Market Intervention," in *The Swiss National Bank, 1907–2007* (Zurich: Swiss National Bank, 2007), pp. 295–304; Eisuke Sakakibara and Akira Kondoh, "Study on the Internationalisation of Tokyo's Money Markets," *Japan Center for International Finance Policy Study Series* No. 1, June 1984; Shinji Takagi, "Internationalization of the Yen: Unfinished Business or Mission Impossible?" in Yin-Wong Cheung and Guonan Ma, eds., *Asia and China in the World Economy* (Singapore: World Scientific Publishing, 2011).
5. Dong He and Honglin Wang, "Dual-Track Interest Rates and Conduct of Monetary Policy in China," HKIMR Working Paper No. 21, 2011.
6. Haihong Gao argues that renminbi internationalization stimulates the development of direct finance and makes for a broader second track. See "Internationalization of the Renminbi and Its Implication for Monetary Policy," in Chang Shu and Wensheng Peng, eds., *Currency Internationalization: International Experiences and Implications for the Renminbi* (Basingstoke: Palgrave Macmillan, 2010), pp. 209–20.
7. Catherine Schenk, *The Decline of Sterling; Managing the Retreat of an International Currency 1945–1992* (Cambridge: Cambridge University Press, 2010).
8. Richard Cooper, "The Interest Equalization Tax: An Experiment in the Separation of Capital Markets," *Finanzarchiv Band 24,* 1965; Barry Eichengreen, "From Benign Neglect to Malignant Preoccupation: U.S. Balance of Payments Policy in the 1960s," in George Perry and James Tobin, eds., *Economic Events, Ideas, and Policies: the 1960s and After* (Washington, DC: Brookings Institution Press, 2000), pp. 185–239.
9. Guonan Ma and Robert McCauley, "Do China's Capital Controls Still bind?" in Barry Eichengreen, Yung-Chul Park, and Charles Wyplosz, eds., *China, Asia, and the New World Economy* (Oxford: Oxford University Press, 2008), pp. 312–40; "The Efficacy of China's Capital Controls Evidence from Price and Flow Data," *Pacific Economic Review*, vol. 13, no. 1, February 2008; "Resisting Financial Globalisation in Asia," in *Financial Globalization and Emerging Market Economies, Proceedings of an International Symposium Organised by the Bank of Thailand, Bangkok*, November 7–8, 2009.
10. Daniel Gros, "Dual Exchange Rates in the Presence of Incomplete Market Separation: Long-Run Effectiveness and Policy Implications," *International Monetary Fund Staff Papers*, vol. 35, no. 3 (September 1988). Technically, the financial franc (and the financial rand) traded as separate isocodes (BEF versus BEC, ZAL versus ZAR), whereas the CNH trades as CNY.
11. Paul Mackel and his colleagues read the data to suggest that the CNH forwards based on U.S. dollar Libor and the low offshore renminbi yields increasingly ground both the domestic forward and NDF. It is important, however, that neither the onshore forward nor either offshore forward has been priced as one would expect with full capital mobility. In particular, with renminbi one-year yields in China substantially higher than one-year U.S. dollar Libor yields, capital mobility would require that the forward renminbi be cheap relative to the spot. See Paul Mackel, Daniel Hui, Perry Kojodjojo, and Dominic Bunning, "Renminbi FX Forward Markets: How the Three RMB Curves Are Changing," *HSBC Macro: Asian Currencies*, September 12, 2011.
12. Robert McCauley and Michela Scatigna, "Foreign Exchange Trading in Emerging Currencies: More Financial, More Offshore," *BIS Quarterly Review*, March 2011.
13. Mackel et al., "Renminbi FX Forward Markets."
14. Jeffrey Frankel, "Measuring International Capital Mobility: A Review," *American Economic Review,* vol. 82, no. 2, May 1992.

15. Lawrence Kreicher, "Eurodollar Arbitrage," *Federal Reserve Bank of New York Quarterly Review*, Summer 1982; Ichiro Otani and Siddharth Tiwari, "Capital Controls and Interest Rate Parity: The Japanese Experience, 1978–81," *IMF Staff Papers*, vol. 28, no. 4, December 1981.

16. Guonan Ma, Corinne Ho, and Robert McCauley, "The Markets for Non-Deliverable Forwards in Asia," *BIS Quarterly Review*, June 2004; Corinne Ho, Guonan Ma, and Robert McCauley, "Trading Asian Currencies," *BIS Quarterly Review*, March 2005; Ma and McCauley, "Do China's Capital Controls", "The Efficacy of China's Capital Controls."

17. Until the global financial crisis, this was an unproblematic assumption, because forward exchange rates for major currencies embedded benchmark interbank rates like Libor with law-like consistency, with very rare deviations See Mark Taylor, "Covered Interest Arbitrage and Market Turbulence," *Economic Journal*, vol. 99, no. 396, June 1989. The recent financial crisis was marked by a dollar shortage (Patrick McGuire and Goetz von Peter, "The US Dollar Shortage in Global Banking," *BIS Quarterly Review*, March 2009; "The US Dollar Shortage in Global Banking and the International Policy Responses," BIS Working Paper No. 291, October 2009) that led to deviations from closed interest parity that are interpreted as dollars priced at rates above dollar Libor (Naohiko Baba and Frank Packer, "Interpreting Deviations from Covered Interest Parity During the Financial Market Turmoil of 2007–08," *Journal of Banking and Finance*, vol. 33, 2009). In Figure 3, if U.S. dollar yields embedded in the NDFs rose well above U.S. dollar Libor in late 2008, then the (unusually markedly positive) implied renminbi yield is understated. Indeed, because the so-called basis in the forward markets of major currencies has persisted with varying intensity since the crisis, the inferred renminbi yields are biased downward to some extent ever since the Lehman Brothers failure. Jinzhao Chen attempts to purge the implied renminbi yield of the basis using the first factor of a principal components analysis of six other Asian currencies against the U.S. dollar. See *Le régime de change dans la réforme Chinoise*, thesis submitted to Université de Paris Ouest Nanterre La Défense, December 8, 2010, pp. 94–98.

18. Ma, Ho, and McCauley, "Markets for Non-Deliverable Forwards."

19. The one-year swap rate resembles the offshore forwards more closely than the PBC bill rate in that both the domestic interest rate swap and the offshore forwards involve private parties (banks) rather than a quasi-sovereign (central bank). The swap and forward deals both feature private credit risk, but not first-order private credit risk (as in a bank deposit where the full amount is at risk) since they are both contracts for difference between the agreed fixed rate and the average floating rate (seven-day repo), on the one hand, and between the agreed exchange rate and the realized exchange rate at the maturity of the contract.

20. Of course, the Chinese government could issue enough bonds in Hong Kong to bring the pricing in line. Such issuer arbitrage could force up offshore yields, given the renminbi available in Hong Kong to purchase them. However, this possibility does not remove the observation that Hong Kong investors are paying a premium over those in Shanghai.

21. Investors in U.S. corporate bonds issued in Europe before the repeal of U.S. withholding tax on interest in 1984 ran such a risk. One day their U.S. corporate eurodollar bonds, which had yielded less than U.S. treasuries, had fallen in price to establish a spread over U.S. Treasury yields similar to that in the U.S. corporate bond market.

22. Eduardo Levy Yeyati, Sergio Schmukler, and Neeltje van Horen, "International Financial Integration Through the Law of One Price: The Role of Liquidity and Capital Controls," *Journal of Financial Intermediation*, vol. 18, 2009; Eduardo Levy Yeyati, Sergio Schmukler, and Neeltje van Horen, "Crises, Capital Controls and Financial Integration," in Masahiro Kawai and Mario Lamberte, eds., *Managing Capital Flows in Asia: The Search for a Framework* (Northampton: Edward Elgar, 2010), pp. 160–91.

23. For evidence on speed of convergence of the prices of cross-listed shares, see Wensheng Peng, Hui Miao, and Nathan Chow, "Price Convergence Between Dual-Listed A and H Shares," *China Economic Issues*, no. 6, July 2007; McCauley and Ma, "Resisting Financial Globalisation in Asia."

24. Guonan Ma, Yan Xiandong, and Liu Xi, "China's Reserve Requirements: Practices, Effects and Implications," BIS working paper, forthcoming 2011.

25. The offshore bond issuance by the Chinese government may be an exception. If the funds raised are simply added to a government account at the PBOC rather than spent, then the funds are sterilized—and possibly at a lower cost than using onshore PBOC bills. See Ma, Xiandong, and Xi, "China's Reserve Requirement."

26. Eisuke Sakakibara and Akira Kondoh, "Study on the Internationalisation of Tokyo's Money Markets," Japan Center for International Finance Policy Study Series No. 1, June 1984.

27. Robert Cookson, "Currencies: Renminbi Has Yet to find Great Favour in Loan Market," *Financial Times*, September 12, 2011.

28. Robert Aliber, "The Integration of the Offshore and Domestic Banking System," *Journal of Monetary Economics*, vol. 6, no. 4, October 1980.

29. Foreign currency credit to Chinese borrowers is larger than cross-border credit owing to foreign currency extended by banks in China. See Claudio Borio, Robert McCauley, and Patrick McGuire, "Global Credit Growth and Domestic Credit Booms," *BIS Quarterly Review*, September 2011. According to the PBOC's Financial Statistics for August 2011, foreign currency loans reached $508 billion, up 24.6 percent year over year.

30. Indeed, it is said that China-based real estate companies issued dollar bonds with principal and interest payments linked to the renminbi because the firms anticipated a faster process to send dollars to their mainland affiliates.

31. Until recently, firms in China have been able to sell offshore bonds in renminbi only through their offshore affiliates. The share of Chinese residents can be expected to rise toward that of Chinese nationals with the change, much as the share of U.S. residents rose

after the repeal of the U.S. withholding tax on bond interest (which had led to U.S. firms selling eurodollar bonds through Netherlands Antilles financing subsidiaries).

32. Robert McCauley, "Internationalising the Australian dollar," in Chang Shu and Wensheng Peng, eds., *Currency Internationalization: International Experiences and Implications for the Renminbi* (Basingstoke: Palgrave Macmillan, 2010), pp. 56–77.

33.Yin-Wong Cheung, Guonan Ma, and Robert McCauley, "Why Does China Attempt to Internationalise the Renminbi?" in Jane Golley and Ligang Song, eds., *China Rising: Global Challenges and Opportunities* (Canberra: Australian National University Press and Social Sciences Research Press, 2011), pp. 45–68.

34. Takeo Hoshi Anil Kashyap, *Corporate Financing and Governance in Japan* (Cambridge: MIT Press, 2001), pp. 232–36.

35. This section dwells on the policy challenges arising in situations when money market yields are such that there are incentives for inward arbitrage flows. Policy challenges can also arise when higher rates offshore draw funds from the domestic banking system. In that case, the authorities have been known to do operations in the offshore markets. See Dong He and Robert McCauley, "Offshore Markets for the Domestic Currency: Monetary and Financial Stability Issues," in Yin-Wong Cheung and Jakob de Haan, eds., *The Evolving Role of China in the Global Economy* (Cambridge, MA: MIT Press, 2010); also Gianni Toniolo, *Central Bank Cooperation at the Bank for International Settlements, 1930–1973* (Cambridge: Cambridge University Press, 2005).

36. For a consideration of the issue of monetary control and Euromarkets, see Gunter Dufey and Ian Giddy, *The International Money Market*, 2nd ed. (Englewood Cliffs, NJ: Prentice-Hall, 1964). Allan Meltzer cites the growth of commercial paper outstanding by bank affiliates, which rose from $200 million in April 1969 to $3.7 billion in October of that year, but the eurodollar liabilities provided the big substitute for domestic deposits. See *History of the Federal Reserve, Vol. 2, Book 1: 1951–1969* (Chicago: University of Chicago Press, 2009), p. 569.

37. Federal Open Market Committee, *Memorandum of Discussion,* February 4, 1969, p. 44, http://www.federalreserve.gov/monetarypolicy/files/fomcmod19690204.pdf.

38. Ibid., p. 26.

39. He and McCauley, "Offshore Markets for the Domestic Currency."

40. The peak, reached before the crisis, reflected the ambition of European banks to play a big role in U.S. dollar intermediation by borrowing dollars from U.S. residents and nonresidents, including central banks, to fund loans and asset backed securities. Ben Bernanke, Carol Bertaut, Laurie DeMarco, and Steven Kamin, "International Capital Flows and the Returns to Safe Assets in the United States, 2003–2007," Board of Governors of the Federal Reserve System International Finance Discussion Paper No. 1014, February 2011.

41. See Ma, Xiandong, and Xi, "China's Reserve Requirements."

42. Indeed, the rise in the foreign bank share of U.S. commercial and industrial loans to something like one-half by the time that the Federal Reserve lowered reserve requirements to zero in 1990 took advantage of the asymmetric extension of the requirements to the offshore branches of U.S.-chartered banks but not to offshore affiliates of foreign-chartered banks See Robert McCauley and Rama Seth, "Foreign Bank Credit to U.S. Corporations: The Implications of Offshore Loans," *Federal Reserve Bank of New York Quarterly Review*, vol. 17, no. 1, Spring 1992.

43. Tomoyuki Fukumoto, Masato Higashi, Yasunari Inamura, and Takeshi Kimura, "Effectiveness of Window Guidance and Financial Environment," *Bank of Japan Review*, edition 4, August 2010.

44. See Claudio Borio, Robert McCauley, and Patrick McGuire, "Global Credit Growth and Domestic Credit Booms," *BIS Quarterly Review*, September 2011, pp. 43–57.

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Robert N. McCauley serves as the senior adviser in the Monetary and Economic Department of the Bank for International Settlements (BIS) in Basel. His recent work on Asia has included analyses of capital flows, regional financial integration, bond and foreign exchange markets, effective exchange rates, foreign currency bank deposits, monetary policy, and foreign banks' domestic currency operations.

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