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Eurodollar banking and currency internationalisation[1]

It is widely held that currencies of surplus countries, such as China, cannot enjoy wide international use. We argue that the eurodollar market has had little to do with the direction of net capital flows or the US current account balance. It has played different roles over the past 38 years, most of all intermediation among non-US residents. Looking at the eurodollar market could help predict the evolution of the offshore renminbi market. Even if it now mainly serves as a conduit of funds to mainland China from abroad, in the future this market, too, could mainly intermediate between non-Chinese residents.

JEL classification: E4, E5, F3, F4, G15.

Wider international use of emerging market currencies, in particular the Chinese renminbi, has revived interest in the role of offshore markets (He and McCauley (2010), Maziad et al (2011), Frankel (2011) and BIS (2011)). In this special feature, we review the patterns of international flows of funds in the eurodollar market, focusing on the importance of residents and non-residents in offshore activity and the market's role as a conduit for capital flows.

Distinguishing gross flows from net flows, we find that most eurodollar flows do not finance the US current account (Borio and Disyatat (2011), Shin (2011)). This finding puts into doubt assertions that international use of the renminbi requires China to run a current account deficit. It also suggests that one-way speculative positioning, taken by some critics (Yu (2011)) as the main impetus for international use of the renminbi, will prove to be temporary.

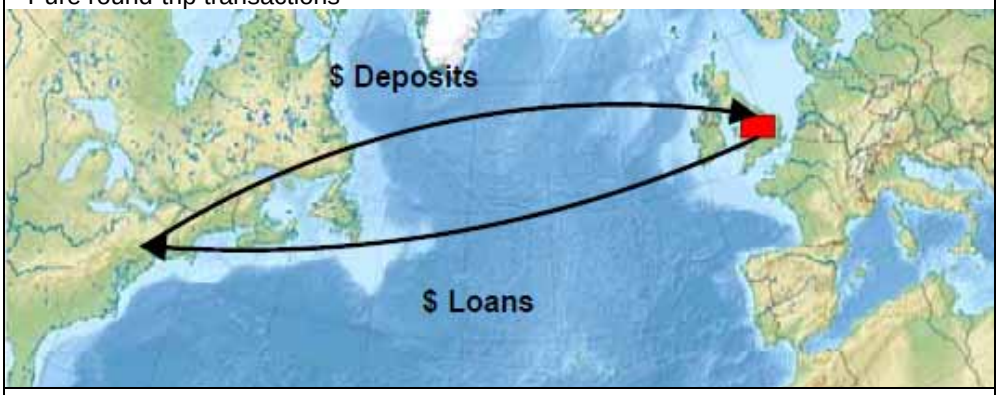
Rather, we expect that the offshore renminbi market will play the usual role of intermediating between non-residents, especially as non-Chinese become willing renminbi borrowers. As He and McCauley (2010) have argued, offshore markets perform essential economic functions, including separation of currency and country risks and the diversification of operational risks.

[1] The authors are from the Hong Kong Monetary Authority (HKMA) and the Bank for International Settlements (BIS), respectively. They thank Pablo García-Luna and Karsten von Kleist for research assistance and Claudio Borio, Stephen Cecchetti, Patrick McGuire and Christian Upper for discussion. The views expressed are those of the authors and not necessarily those of the HKMA or the BIS.

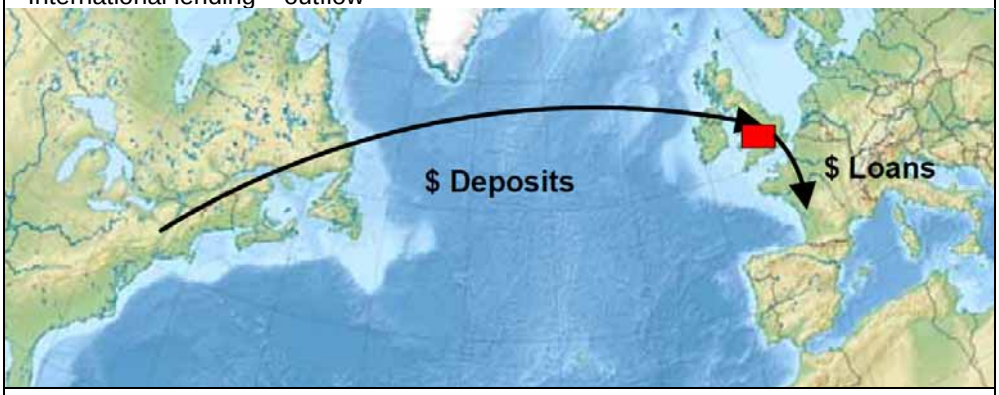
Eurodollar banking transactions

Pure offshore transactions

Pure round-trip transactions



International lending – outflow



International lending – inflow

Source: Authors' adaptation of Dufey and Giddy (1978, p 165; 1994, p 292). Graph 1

From a residency perspective, offshore markets can feature four types of flows (Graph 1). In *pure offshore* markets, non-residents borrow from and lend to each other in the home currency (in the eurodollar market example in the graph, US dollars). In *round-trip* transactions, residents deposit home currency with banks offshore and residents borrow it back in a loop. Finally, the offshore market can be a conduit for *net flows* in domestic currency between the domestic economy and abroad.

With this typology in hand, we consult BIS data on the eurodollar market, covering 38 years.[2] We find that this market has played all of the roles just sketched, although their relative importance has shifted over time. Generally, the most common transaction involved a non-US borrower sourcing funds from a non-US lender, as in the pure offshore type. That said, the period from the latter 1990s to 2007 also featured a rise in round-tripping, with European banks borrowing dollars from US residents in order to fund claims on them, especially private asset-backed securities. Only to a limited extent has the eurodollar market served as a conduit of funds either from the United States to abroad (into the 1980s) or from abroad to the United States (more recently).

The rest of this feature is organised into four sections. First, we propose a typology of offshore markets in more detail. Second, we show how the eurodollar market has performed various functions over time. Third, we use our typology to analyse the balance sheet of the offshore renminbi market today and to discuss its likely evolution in the future. The final section concludes.

Typology of the eurodollar banking market

Our typology of eurodollar market financing distinguishes between sources and uses of funds according to residence. In two types, the residence of sources and uses is identical, either both the United States or both offshore. In the other two types, the residence of sources and uses is different, making the offshore market a conduit for international lending inflows or outflows.

Pure offshore transactions

The eurodollar market intermediates between non-residents ...

The archetypal transaction in the offshore market of an internationalised currency is one denominated in that currency, that takes place between non-residents, outside the country of issue of the currency and subject to the law of another jurisdiction. Such a transaction, pictured in the top panel of Graph 1, need not register in the capital account or the current account of the currency's home country, although it typically clears and settles through banks in the country of issue.

Consider an example from the 1970s: a Middle East central bank deposits $10 million in a bank in London, which in turn lends the funds to a Brazilian oil importer. The dollars might go through one or more offshore interbank

[2] Unfortunately, we miss the first 15–20 years of the eurodollar market (Schenk (1998)).

transactions that could take place in London or another banking centre, and the interbank counterparties could be arm's length or affiliated.[3]

Another example shows that pure offshore intermediation in the eurodollar market can also function as what Obstfeld and Taylor (2004) call an asset swap. This is a symmetrical exchange of claims that amount to a pair of offsetting *gross* flows but no net flow. A German resident and a French resident exchange dollar claims on each other. Here, they diversify their portfolios in the dimensions of credit (a claim on a foreign rather than domestic resident) and currency (a claim in dollars instead of French francs or Deutsche mark (or, more recently, euros)).[4]

It is important to recognise that ultimately pure offshore intermediation in dollars does not require either sourcing funds, or deploying funds, in the United States. In the example of London's intermediation of dollars between the Middle East oil producer and Brazilian oil importer, the story can be told of the Brazilian firm borrowing dollars in London to buy oil and the Middle East central bank ending up holding the deposit created by the drawdown of the loan. Or the story can be told in the other direction, as described above. Again, while the funds may flow through the US banking system, the residence of the placer of funds, the residence of the borrower of funds, the booking location of the deposit and the loan, and the jurisdiction governing the transaction are all outside the United States.

Pure round-trip transactions

... or between US residents ...

A pure round-trip transaction is the opposite of a pure offshore transaction, ie both sides of the transactions are residents, not non-residents. In this type, pictured in the second panel of Graph 1, the offshore market serves as a balance sheet through which funds loop from the domestic economy back to it. (Historically, pure eurodollar round-tripping would be better portrayed as linking New York and Caribbean centres, with banks in New York controlling assets and liabilities in their Caribbean branches.)

Pure round-trip transactions can be motivated by regulatory arbitrage (Aliber (1980, 2002)). If domestic deposits attract reserve requirements or incur deposit insurance premiums or pay yields that are capped by interest rate regulation, then depositors willing to hold a deposit in a Caribbean or London branch of a familiar bank can avoid such costs or regulations and receive a higher yield. In some ways, offshore round-tripping of funds responds to the same regulatory incentives as intermediation by non-bank financial institutions within an economy. Institutions such as finance companies, often dubbed "shadow banks", typically are similarly not subject to reserve requirements, deposit insurance or interest rate caps.

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[3] In the 1970s, Middle East oil exporters ran current account surpluses while Brazil ran current account deficits, so this transaction through the eurodollar market exemplifies what Obstfeld and Taylor (2004) dub development finance, involving *net* flows. From the standpoint of the US economy, however, there is no net borrowing or lending.

[4] Note that, in order to diversify credit, the French asset manager must deposit with a non-French bank, so different nationality rather than merely different residence is involved.

Round-tripping can also involve important credit intermediation in which a non-US bank puts its capital at risk. In the 2000s, as we shall see below, European banks attracted dollar funding from risk-averse US residents in order to finance holdings of ultimately risky US asset-backed securities at what seemed to be attractive spreads.

Net international lending through offshore markets

... and serves as a conduit for net international lending

Both types already considered are, from the standpoint of the United States and the rest of the world, gross flows. Dollars flow from non-residents to non-residents or from residents to residents. In the third and fourth types, the residence of the source and use of funds differs: one is a resident of the United States and the other a non-resident. In the outflow type (Graph 1, third panel), funds flow from US residents into the offshore market, where they are lent to non-residents. In the inflow type (Graph 1, bottom panel), funds flow from non-residents through the offshore market to US residents.[5] This is the realm of net capital flows. For example, we conjecture that offshore Australian dollar deposits placed by non-Australians ultimately fund claims on Australian households and firms.[6] We will see that such is not the case for the eurodollar market, where net international lending between the US and abroad, whether outflows or inflows, has rarely been important compared to gross flows.

The eurodollar market experience

In this section, we interpret eurodollar banking in relation to these types. We first find that eurodollar banking is large, with intermediation offshore amounting to as much as a quarter or a third of global dollar intermediation. Second, we find that over the long run the eurodollar market has primarily performed pure offshore intermediation among non-residents. However, round-tripping grew to reach a rough balance with pure offshore intermediation by the mid-2000s. Finally, net lending/borrowing has generally remained modest, even as the US economy shifted from a net international creditor to a net international debtor position.

The scale of eurodollar banking

The eurodollar market is sizeable in relation to domestic US banking

The offshore component of US dollar banking is large, both absolutely and relative to its domestic counterpart. This can be seen in the memorandum items in the last row of Table 1. A quarter of the US dollar balance sheet is located outside the United States, the highest share for any of the currencies for which the BIS data provide a breakdown (McCauley (2010, p 63)).

The offshore share of dollar banking is not only large, but also, until the global financial crisis, it tended to grow in relation to the US banking system. By the fourth quarter of 1974, some 17 years after the birth of the eurodollar market, offshore dollar claims on, and liabilities to, non-banks had grown to 9%

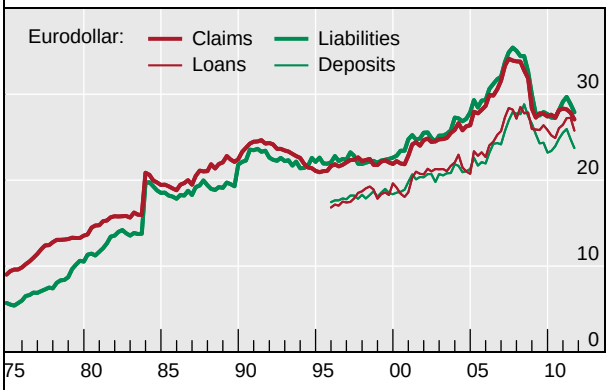
[5] Either corresponds to what Obstfeld and Taylor (2004) call development finance.

[6] See Australian Bureau of Statistics (2001, 2008) and McCauley (2010).

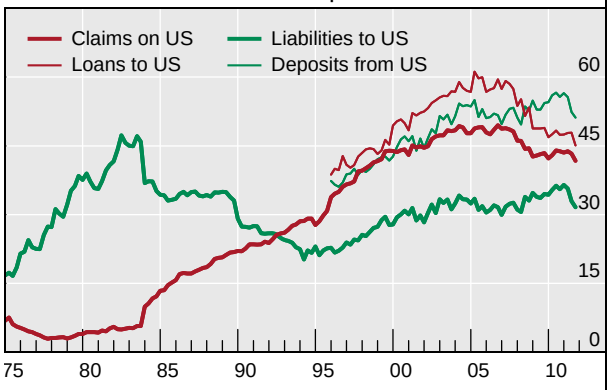
Eurodollar banking: relative size and importance of US residents

In per cent

Eurodollar share of global dollar banking[1]



Positions against US non-bank residents as a share of total eurodollar positions



[1] Break in series in Q4 1983, when Caribbean centres joined the reporting area.

Sources: Federal Reserve Statistical Release Z.1 (flow of funds); BIS. Graph 2

and 6% of global dollar claims and liabilities, respectively (Graph 2, left-hand panel). This understated the share of dollar banking outside the United States, since the data did not yet cover the Caribbean booking centres. Their inclusion in the BIS reporting area at the end of 1983 resulted in a jump in this percentage. Then, the proportion of offshore intermediation in global dollar intermediation levelled off in the 1990s after the Federal Reserve lowered reserve requirements on large-denomination domestic deposits to zero, in effect removing its tax on intermediation in the United States. But then, in the 2000s, the offshore proportion went up again despite the absence of reserve requirements and deposit insurance on deposits in the United States, to reach more than a third. The proportion of global dollar intermediation outside the United States has fallen since the global financial crisis. To anticipate our finding below, this rise and fall in the eurodollar market's share in overall dollar bank intermediation was associated with a rise and fall in round-tripping.

Pure offshore intermediation and round-tripping

Pure offshore intermediation is the norm for eurodollar banking ...

Most dollar offshore banking corresponded in mid-2010 to the pure offshore type. This can be seen in the assets of banks outside the United States in Table 1. As of mid-2010, total claims booked offshore were $4.867 trillion, of which $2.143 trillion were claims on US residents. Thus, some $2.7 trillion out of the approximately $4.9 trillion offshore claims sheet represented claims on residents of countries other than the United States. Moreover, pure offshore banking has been regaining importance since the onset of the global financial crisis.

To see the rise and fall of round-tripping, we plot four US shares of the offshore dollar balance sheet (Graph 2, right-hand panel). In this panel, pure offshore banking registers at zero and pure round-tripping at 100%. For instance, the above-mentioned $2.1 trillion of claims on US non-banks in June 2010 represented 44% of total claims, as plotted by the thick red line for that date. Claims on US residents originally accounted for a single-digit percentage

of overall offshore claims. It became evident that they were a bit higher when the Caribbean centres joined the reporting area in 1983. This percentage then rose to almost half before the outbreak of the crisis, and has fallen since. US residents accounted for an even larger share of loans, once these were separately identified in the mid-1990s, as shown by the thin red line.

On the liabilities side, the eurodollar market from early on drew considerably on deposits from US residents, with the percentage fluctuating between 20 and 40% as shown by the thick green line in Graph 2, right-hand panel. In the 1970s, dollar interest rates offshore were considerably higher than onshore, since onshore deposits attracted reserve requirements, incurred deposit insurance premiums, and were also subject to an interest rate cap under Regulation Q. As a result, investment in a London or Caribbean dollar deposit produced incremental interest income (Kreicher (1982)). High money market yields in 1979–82 increased the effective cost of reserve requirements and led to rapid growth in placements in the eurodollar market, as money market funds competed for yield by investing more offshore. Some of the subsequent decline in the share of funding from US residents may be an artefact of banks relying more on dollar bonds for funding, given that the residence of holders of their bonds cannot usually be identified. When deposits

Consolidated global US dollar bank balance sheet, June 2010

In billions of US dollars

Banks in the United States vis-à-vis non-banks			
Assets		Liabilities	
Cash and reserves at the Fed	956	Cash	.
Loans	6,837	Deposits	8,274
Of which: to rest of world	101	Of which: from rest of world (including currency)	590
Securities	2,576	Credit market instruments	1,923
Miscellaneous assets	4,117	Miscellaneous liabilities and tax payable	2,549
Total onshore	**14,487**	**Total onshore**	**12,747**
Banks outside the United States vis-à-vis non-banks			
Assets		Liabilities	
Loans	2,246	Deposits	2,588
Of which: to US residents	1,086	Of which: from US residents	1,465
Other claims	2,621	Other liabilities	1,519
Total claims offshore	**4,867**	**Total liabilities offshore**	**4,108**
Of which: on US residents	2,143	Of which: to US residents	1,491
Grand total onshore + offshore	**19,354**	**Grand total onshore + offshore**	**16,855**
Memo: outside US as % of grand total	*25.1*	*Memo: outside US as % of grand total*	*24.4*

The US data consolidate US-chartered banks, foreign branches of foreign-chartered banks and bank holding companies. For the US data, loans include bank loans, mortgages, consumer credit, security credit and customers' liability on acceptances; securities equal total bank credit less loans; miscellaneous assets exclude investment in bank subsidiaries of bank holding companies; deposits include all deposits and federal funds and security repos; securities include open market paper, corporate bonds and other loans and advances; miscellaneous liabilities exclude investment by bank holding companies in US-chartered banks. In general, assets can exceed liabilities owing to equity and owing to the use of foreign exchange swaps to produce dollar funding.

Sources: Authors' compilation based on Federal Reserve Statistical Release Z.1 (flow of funds), Tables L.107 and L.110–112; BIS international banking statistics.

Table 1

were separately identified in the mid-1990s, as shown in the thin green line in Graph 2, right-hand panel, the proportion of US residents among eurodollar depositors, at around 40%, resembled the level and the shape of the share of US residents among borrowers in the loan market.

… but round-tripping gained importance until 2007 …

Stepping back, it is evident that over time the eurodollar market shifted from pure offshore to a rough balance between intermediation for the rest of the world and for US residents. At first blush, this is strange: by the 2000s the original regulatory incentives for round-tripping – namely, Fed reserve requirements on large-denomination certificates of deposit and FDIC insurance assessments on domestic but not offshore deposits – had disappeared.

… owing to regulatory arbitrage

The rise in round-tripping has been interpreted as a result of regulatory arbitrage. In their ill-fated dollar intermediation, European banks borrowed dollars from US money market funds, among others (McGuire and von Peter (2009), Baba et al (2009)), and invested in private asset-backed securities (Bernanke et al (2011), Bertaut et al (2012)). While US and Canadian banks were subject to minimum capital/asset ratios as well as capital/risk-weighted asset ratios, European banks, like US securities firms, were not.[7] Thus, European banks could gear up their equity by 30 or 40 times, investing in assets with low risk weights, including well rated private mortgage-backed securities. Of course, European banks could use affiliates in the United States to borrow dollars and to invest in such securities; but many used affiliates outside the United States, thereby contributing to round-tripping. As European banks continue to deleverage their dollar balance sheets after the crisis, one can expect round-tripping in the eurodollar market to continue to subside.

Net international lending

Net international lending generally remained relatively small

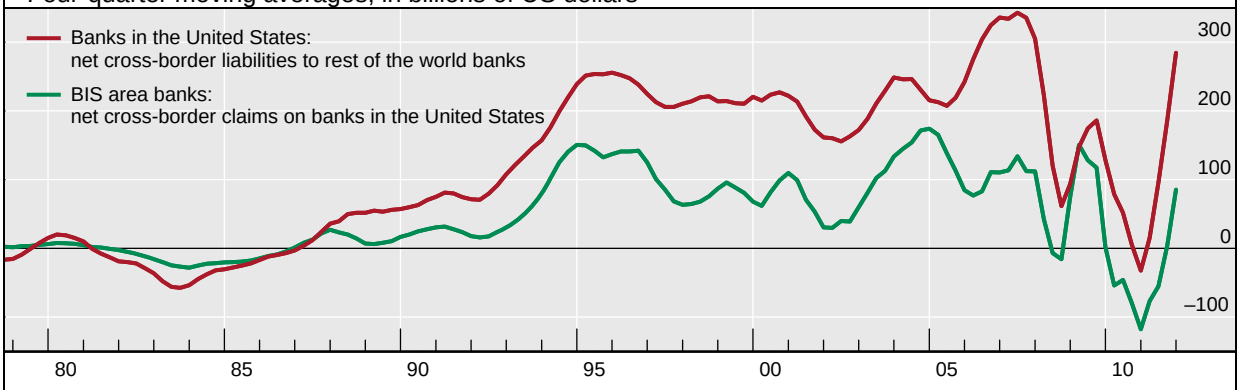
The eurodollar market served as conduit for net flows of funds between the United States and the rest of the world only to a limited extent. Given the importance of the banking system as a conduit for capital flows, one might expect on macroeconomic grounds that, as the US net international investment position went from positive to negative with the chronic current account deficits of the 1980s, banks in the United States might have shifted from supplying dollars to banks offshore to drawing in dollars from them.[8] Qualitatively, this expectation was realised; but quantitatively, not much or for long. To be sure, the net claim of banks in the United States turned into a consistent net liability on cue when the US net international investment position turned negative in

[7] This will change with the implementation of Basel III, which includes a new unweighted leverage ratio. The limitations in Basel II that became evident were addressed by the Basel Committee on Banking Supervision (2009; 2010, pp 5–6) revisions of the capital requirements for the trading book as well as the new unweighted leverage ratio. See also the discussion in Bernanke et al (2011) and UBS (2008).

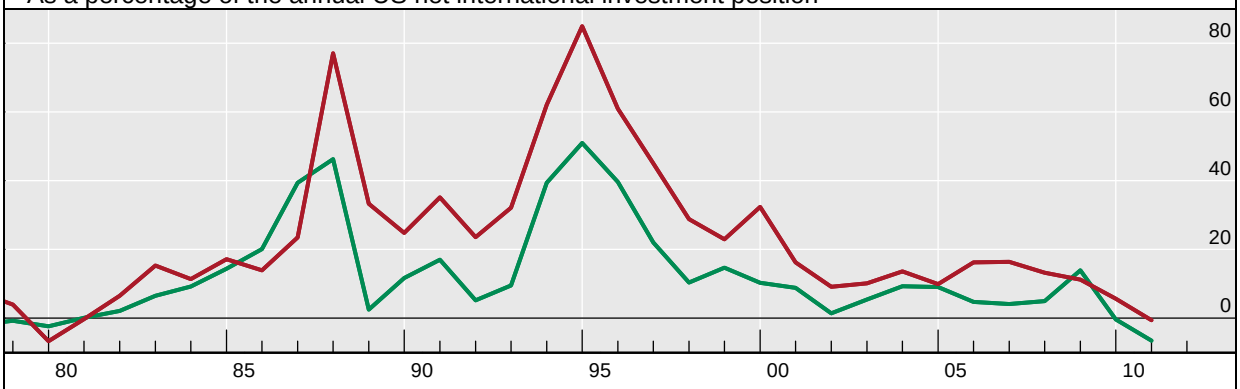
[8] In Table 1, claims on US non-bank residents of banks outside the United States ($2.143 trillion) exceed liabilities to them ($1.491 trillion), suggesting a possible net inflow, quite apart from the interbank flow. However, on the liabilities side, banks outside the United States generally cannot identify the residence of their bondholders. However, US Treasury et al (2011, p 23) report $0.7 trillion holdings by US residents of long-term bonds issued by foreign firms in the financial industry. Taking most of this to be bank bonds, it is not clear that there is any net dollar lending by banks outside the United States to US non-banks.

Cross-border interbank liabilities of banks in the United States

Four-quarter moving averages, in billions of US dollars



As a percentage of the annual US net international investment position



Banks in the United States report larger net cross-border interbank liabilities than BIS-area banks report net cross-border interbank claims on the United States in part because banks in the United States have substantial liabilities to banks outside the BIS reporting area (including China, Barbados, the Philippines, Venezuela, Israel and Russia). In addition, the US reporters include non-bank broker-dealers in the United States, against which banks outside the United States do not report positions. The resulting difference narrowed in the fourth quarter of 2008 when two major US securities firms became bank holding companies and a bank acquired another securities firm.

Sources: US Bureau of Economic Analysis; BIS. Graph 3

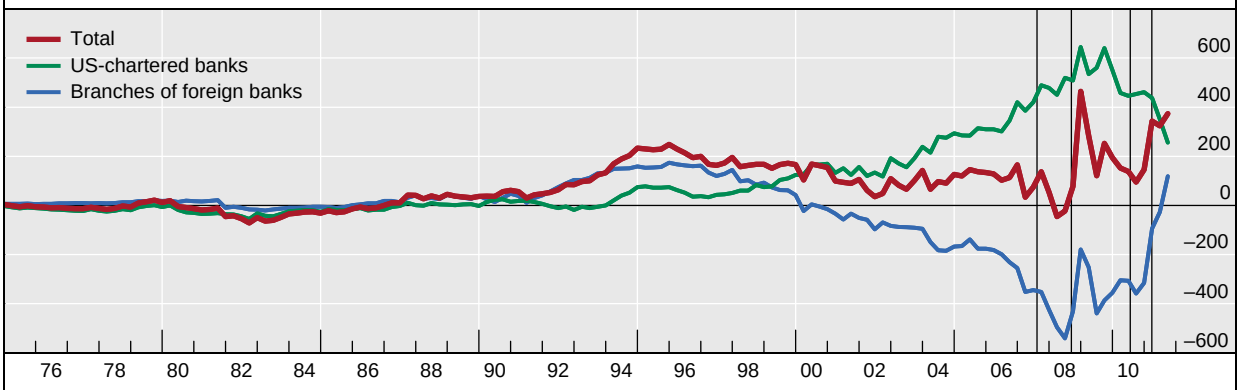
1986 (Graph 3, top panel). However, this net claim accounted for a substantial fraction of the US net debt only into the mid-1990s (Graph 3, bottom panel). If one juxtaposes the scale of the top panel in Graph 3 – *hundreds of billions of dollars* – with the *trillions of dollars* in Table 1, it is evident that net interbank flows remained small in relation to the overall size of the eurodollar market.

Thus, while the interbank channel shunted dollars from the United States to the rest of the world when the United States was a net creditor and has on balance brought in dollars since the United States became a net debtor, the channel was never very large. On this showing, the eurodollar market has struck a shifting balance between *gross* flows (strictly offshore intermediation and round-tripping) more than serving as a conduit for *net* international lending.

Net bank flows between the rest of the world and the United States remained small because they were subject to strong cross-currents (Shin (2011)). In the 2000s, while US-owned banks were drawing on their foreign affiliates in order to fund their US operations (Graph 4, green line),

Net cross-border interbank liabilities of banks in the United States

In billions of US dollars



US-chartered banks include subsidiaries of foreign banks; flow of funds data treat international banking facilities as outside the United States. The vertical lines denote August 2007 (interbank strains), September 2008 (Lehman failure), July 2010 (Dodd-Frank) and end-March 2011 (FDIC assessment on non-deposit liabilities).

Source: Federal Reserve Statistical Release Z.1 (flow of funds). Graph 4

foreign-owned banks borrowed in the United States and forwarded the proceeds to their offices abroad (Graph 4, blue line).[9]

In summary, the eurodollar banking market has played various roles in international finance over time. Most characteristically, it has served as an intermediary between non-US placers of dollars and non-US borrowers of dollars. The element of round-tripping between US depositors and US borrowers grew over time and peaked at close to half the market in 2007. Net interbank flows have remained modest, even as the US economy shifted from a net international asset position to a net international liability position. The eurodollar market has intermediated funds mainly between borrowers and lenders outside the United States and to a lesser extent between borrowers and lenders within the United States, but hardly at all between borrowers in the United States and lenders abroad. This experience provides useful perspective on the current role of the offshore renminbi market.

Lessons for renminbi offshore banking

At present, the renminbi balance sheet of banks in Hong Kong SAR serves as a conduit for net renminbi lending from the rest of the world to the mainland. Through it, non-residents stake renminbi claims on mainland China. Deposits in renminbi by residents of Hong Kong and the rest of the world outside the mainland comprise the main source of funds. On the uses side, banks have claims on entities on the mainland, including the central bank, and some interbank claims and investments in government and corporate bonds.

Renminbi bonds issued by non-banks and held outside the banking system, which are not captured in Table 2, tend also to result in a net renminbi claim of the rest of the world on China. The government, government agencies,

[9] Recently, these positions have fallen in absolute value under the combined influence of Dodd-Frank's change in the assessment base for FDIC insurance and the Federal Reserve's second round of US Treasury purchases (Kreicher et al (2012)).

banks and firms resident on the mainland probably account for the majority of the ultimate renminbi obligations associated with $40 billion equivalent of renminbi bonds issued by others than banks resident in Hong Kong.[10]

Pure offshore intermediation is a minority of offshore renminbi market activity…

As things stand, pure offshore intermediation in the renminbi offshore market accounts for a minority of activity there. At the end of 2011, loans and advances in renminbi booked by banks in Hong Kong were only CNY 31 billion, about 3% of total assets, and in addition a good part of the CNY 222 billion in negotiable debt instruments comprised trade claims on non-banks resident outside the mainland. Their sum, which can be taken as the upper limit of pure offshore intermediation, remains well below the CNY 588 billion in deposits (Table 2).[11] If the renminbi offshore market were to follow the eurodollar market, this pure offshore intermediation would rise. Indeed, loans and advances in renminbi booked by Hong Kong banks grew rapidly in the first quarter of 2012.

For its part, pure round-tripping accounts for little, if any, activity in the renminbi offshore market. As the offshore yields on renminbi deposits and bonds have been significantly lower than onshore, there is little incentive for mainland residents to invest in offshore renminbi assets. Rather, their interest lies in issuing renminbi liabilities offshore.

… reflecting current policy

This structure of bank balance sheets and bond issuance and holdings, however, reflects factors that are likely to prove temporary. In particular, the mainland Chinese authorities have only started to open the domestic capital market to participation by non-residents, and have retained significant

Renminbi balance sheet of banks in Hong Kong SAR, end-2011

In billions of renminbi

Assets		Liabilities	
Due from banks	665.4	Deposits	588.5
Of which: due from overseas banks	121.7	Personal	174.0
Loans and advances	31.0	Corporate	414.5
Negotiable debt instruments	222.3	Negotiable debt instruments	78.5
Other assets	62.6	Due to banks	184.2
		Of which: due to overseas banks	116.4
		Other liabilities	130.4
Total	**981.6**	**Total**	**981.6**
Memo: US dollar equivalent	**151.8**		

"Overseas banks" means banks from areas outside Hong Kong SAR and mainland China. Other assets/other liabilities include items such as amount receivable/payable under reverse repos/repos, unrealised mark-to-market gains/loss of derivatives and the amount to balance a single currency balance sheet, which is a subset of the balance sheet of all currencies. The end-2011 renminbi/dollar rate was 6.463, according to the Federal Reserve G.5A release.

Source: Hong Kong Monetary Authority. Table 2

[10] According to BIS international securities data, three quarters of renminbi offshore bonds are sold by issuers of Chinese nationality, including issuers incorporated outside China but with beneficial ownership by Chinese entities.

[11] Note that offshore renminbi deposits are still tiny compared to onshore deposits. Onshore deposits amounted to CNY 78 trillion at the end of 2011. In other words, offshore renminbi deposits were less than 1% of onshore deposits.

restrictions on capital flows, particularly on outflows (McCauley (2011)). Expectations of a sharp renminbi appreciation have also dampened the willingness of non-residents to borrow in renminbi.

Looking forward, the offshore renminbi market could evolve to play different roles. Capital flows can be expected to become two-way and more balanced with capital account liberalisation (He et al (2012)).[12] The expected path of the renminbi exchange rate shows much less consistent appreciation, even as the Chinese current account surplus has narrowed. Thus, non-resident borrowing in the renminbi looks to be less discouraged by one-way expectations on the exchange rate.[13] In this case, the renminbi offshore market in Hong Kong (and in other financial centres) can be expected to evolve along the paths of the other types of offshore markets.

Conclusions

The eurodollar market has played different roles over the last 38 years. Originally, although US residents held net dollar claims on the rest of the world through it and round-tripped dollar funds through it, it mostly intermediated between non-US residents. The eurodollar market reached its maximum size relative to domestic US intermediation before the recent global financial crisis on the strength of round-tripping, as European banks sold US investors low-risk placements and bought risky US debts. As European banks deleverage, this round-tripping is shrinking as a share of eurodollar banking, restoring intermediation between non-US residents as the increasingly characteristic eurodollar banking transaction.

An inference is that the current role of the offshore renminbi market as a conduit of funds from the rest of the world to the mainland may not be its last role. Over time, the renminbi offshore market is likely to play above all the role of intermediary between non-mainland borrowers and lenders.

[12] High levels of required reserves on deposits in mainland banks could with more openness encourage round-tripping, but the central bank's practice of remunerating required reserves would limit the incentive to round-trip. See Ma et al (2011)).

[13] Cheung et al (2011) argue that a payoff to China from renminbi internationalisation would come from non-residents borrowing renminbi and thereby sharing China's short renminbi, long foreign currency position and its associated risk.

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