

Elasticity and Discipline in the Global Swap Network

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ABSTRACT

This paper sketches the outlines of the new international monetary system that has emerged in the aftermath of the global financial crisis. At the center of the system, a network of central bank swaps between the six major central banks serves as an elastic backstop for private foreign exchange operations. Farther out on the periphery, a further network of central bank swaps operates to economize on scarce reserves of the major currencies. Meanwhile, in the private foreign exchange market, basis swaps are emerging as the central location where liquidity is explicitly priced, inside the bounds set by central bank swaps.

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“The breakdown of the international money market in the 1930s led to the establishment of the IMF after the war; its gradual revival, especially after 1958, has put the IMF last in the line of short-term adjustment devices. First is the market. Then come central-bank operations of the Basle Club type, which had their origin in the measures taken by central banks to stabilize the market after the revaluation of the mark and the guilder in March 1961. Finally, to tidy up, is the IMF, which funds such short-term obligations as are not reversed, after the crisis is over. At any stage, first, middle or last, the country can use its own reserves.”

(Kindleberger 1967 [1981], 237, my emphasis)

Too often in economic debate about balance of payments deficits, the conversation focuses on owned reserves as first resort, and multilateral official borrowing as last resort, to the neglect of the more common everyday action of international money markets. In actual fact it is here, in the private credit mechanism, that we find the primary source of elasticity and discipline that makes the international payments system work. In effect, deficit countries typically settle daily not with owned reserves but rather with borrowed reserves, reserves borrowed either directly or indirectly from surplus countries in the private international money market. In this way short term capital flows facilitate international commerce, both gross and net, on both capital and trade account.

From this standpoint, more important than official reserve flows or official borrowing is the network of central bank swap lines that backstop international money markets. One consequence of the financial crisis of 2009 has been a formalization and extension of that network. According to McDowell (2015, 1) “more than 70 such swap agreements have been

signed since 2008 involving over 50 countries in every region of the world.” Figure 1 provides a rough sense of the topology of that network as of 2015, which apparently has two centers, one in the United States and one in China, but the image is misleading since not all swaps are equal.

Political scientists have been the first to jump on this new institutional development, suggesting that we are seeing here the first steps toward a new more multilateral international monetary system (Duran 2015, Henning 2015), but a closer examination from the standpoint of the underlying economics suggests otherwise. The swap lines are important, but they are not primarily about political relations between states. Rather they are more about commercial relations between national financial systems. Central bank swaps serve as the backstop of an international monetary system that remains very much a dollar system, but in different ways at different levels of the system.

Figure 1: The Global Swap Network circa 2015



Source: Council on Foreign Relations²

One reason the private credit mechanism is so often overlooked is that in many countries the domestic financial system remains rather underdeveloped and, as a consequence, disconnected from the international financial system. In such countries, international payments are official payments *tout court*. But even in these cases, arguably, the underlying policy problem is often not so much the balance of payments deficits but rather the lack of financial development, and the appropriate corrective may therefore be not so much economic measures to correct the deficit as financial development to facilitate commercial finance of the deficit.

² The picture is taken from an interactive tool available on the CFR website at <http://www.cfr.org/international-finance/central-bank-currency-swaps-since-financial-crisis/p36419#!/#intro>

Official flows stand in temporarily for the private short term capital flows that would, in a more developed country, absorb the deficit without showing up in the official balance at all.³

Long ago, in the waning years of World War II when finance ministers from all over the world met at Bretton Woods, essentially every country in the world, not excepting Britain and the United States, was in precisely this financially underdeveloped state. In wartime, the international flow of goods and capital is not a matter of decentralized commercial calculation but rather of centralized political authority. Everywhere central banks were subordinated to treasuries; de facto if not de jure, central banks were everywhere government banks. And war was not the only reason for this institutional shift to the extreme end of the spectrum of hybridity. Already in the decade before WWII, international money markets had collapsed, and that collapse served as a central mechanism that spread depression worldwide (Kindleberger 1986).

Against this historical background, it is not surprising that the institutional creations at Bretton Woods focused on owned reserves and multilateral official borrowing, and abstracted from the operation of international money markets and also the role of national bankers' banks in providing backstops for those markets.⁴ The Bretton Woods framework made a lot of sense for its time, but in the longer run it has left us with routines of intellectual thought that neglect the most important mechanism at work in the international payments system. As early as 1967, in the quotation that heads this essay, Charles Kindleberger drew attention to the way this neglect

³ Put another way, the problem in these countries is often excess discipline imposed from the outside by the international payments system. To be sure, in many cases international discipline bites precisely because of excess elasticity (insufficient discipline) in the domestic payments system, but even that problem can be as much a consequence as a cause of financial underdevelopment. The essential hybridity of domestic central banks, which serve everywhere both as government bank and bankers' bank, is in these cases as a rule over-weighted on the government bank side. Official credit does what in a more developed country would be the province of private credit, and sometimes it overdoes it.

⁴ Along these lines, Mehrling (2016) offers a revisionist account of the Keynes-White debate at Bretton Woods.

was already serving to distort debate. Today, after an additional fifty years of financial development, the distortion remains with us and serves even more of an obstacle to sound analysis.

Indeed, today all eyes are focused on the so-called BRICS bank announced June 2014 as a potential alternative to both the IMF and the World Bank established at Bretton Woods, and on the upcoming IMF review of the statutory definition of the Special Drawing Right, which is expected to signal eventual inclusion of the Renminbi.⁵ Official actions by finance ministers get all the media attention. But meanwhile developments in private international money markets, and in the central bank swap networks that support those markets, are creating the concrete mechanism of payments elasticity that makes the international payments system work.

The present swap network dates back to 1961, when a network of central bank gold swaps was devised to support the Bretton Woods fixed rate exchange system (James 1996, Bordo et al 2014). However, after the rise of the Euro, this network fell into disuse and in 1998 it was largely dismantled (Duran 2015, 7, fn. 7). Thus, when the Crisis hit, a new swap network had to be established, initially on an ad hoc basis. And then, after the Crisis was over, as the permanent need became apparent, the network was made permanent and extended across the face of the globe.

At the top of the present hierarchy of international money the new network is comprised of unlimited lines between the six major central banks: the Fed, Bank of England, ECB, Swiss

⁵ <http://brics6.itamaraty.gov.br/media2/press-releases/214-sixth-brics-summit-fortaleza-declaration>, <http://www.project-syndicate.org/commentary/chinese-renminbi-in-currency-basket-for-imf-sdr-by-harold-james-and-domenico-lombardi-2015-07>

National Bank, Bank of Japan, and Bank of Canada.⁶ (Observe that I reference the banks themselves, not the states they serve, to remind the reader that we are thinking of them as bankers' banks not government banks.) Each commits to provide the other with its own currency, accepting as sufficient collateral an equivalent quantity of the counterparty's currency. It is important to appreciate that any drawings on these top-level swap lines amount to an expansion of world reserves, not movement of existing reserves. Just as, within the borders of each domestic banking system, commercial banks make loans to their customers by creating deposits, so too at the next higher level central banks make loans to other central banks by expanding their balance sheets on both sides, and the new liabilities are new world reserves. It was precisely swap arrangements like this, between the Fed and other top level central banks to the tune of \$600 billion, that put a floor on the financial crisis in 2009 once it had gone global. Foreign central banks borrowed dollar reserves from the Fed which they lent on to their own domestic banks, which used them to repay maturing funding that they could not otherwise replace. In that process, world reserves increased by \$600 billion.

During the crisis a select few other central banks, outside the C6, also got swap lines from the Fed: South Korea, Singapore, Brazil and Mexico. But these were the exceptions, and everyone else relied on bilateral swap lines with other central banks. This is worth emphasizing. Emerging market economies did not, as a rule, make use of existing official reserve backstops, neither at the IMF nor in existing regional pooling arrangements. Bilateral swaps were the preferred international lender of last resort. And then, after the crisis, additional bilateral swap lines were put in place, most notably as an explicit policy driven by China (Yu 2012, 14). But

⁶ This set of lines was announced October 31, 2013:
<http://www.federalreserve.gov/newsevents/press/monetary/20131031a.htm>. Contract details may be found here: http://www.newyorkfed.org/markets/liquidity_swap.html

these swaps, it is important to emphasize, were almost all of them local currency swaps, not key currency swaps. Thus, they operate to economize on existing reserves not to increase global reserves.⁷ As such, they are best understood as analogues of the central bank swaps within the European Payments Union in the period of severe dollar shortage before 1958 (Kaplan and Schleiminger 1989, 200-201).

Duran (2015) usefully asks why emerging market economies relied on bilateral swap lines, given their access to various other sources of liquidity support such as new IMF facilities and regional pooling arrangements such as the Chiang Mai Initiative, and she offers an essentially political answer. Remembering the IMF's mismanagement of the Asian Financial Crisis, EMEs were wary of the inevitable conditionality that comes with IMF lending, conditionality that is implicated also in the use of regional pooling arrangements. Further, having accumulated large quantities of owned reserves (in an attempt to avoid potential reliance on the IMF), the domestic political standing of central banks had risen relative to finance ministries. Thus when the crisis came it was central banks not Treasuries that took action, and thus the action they took was bilateral swaps.

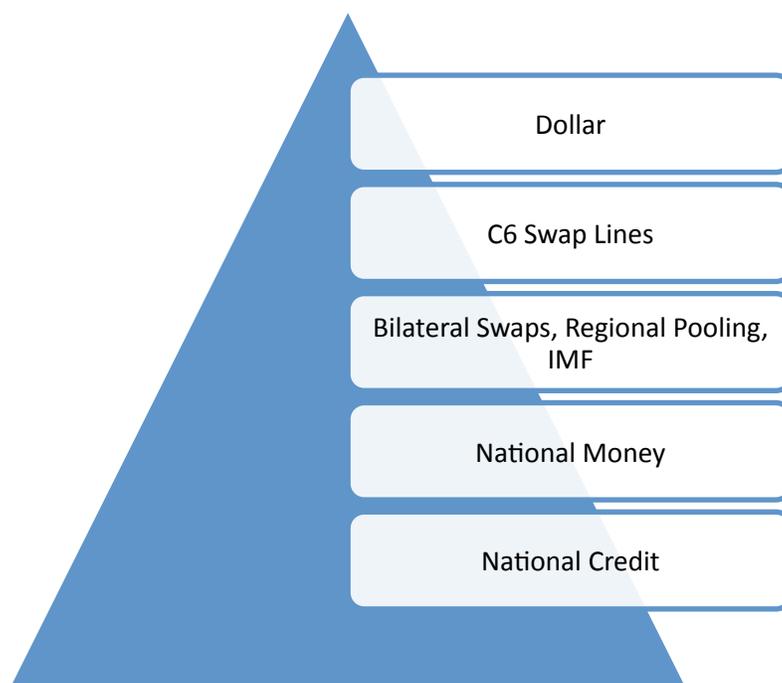
An alternative strictly economic explanation seems equally consistent with the facts. The hoard of EME central bank reserves was perhaps never so much about official self-insurance as it was about providing credible backstop to private banking flows, and in practice that is exactly how the hoard of reserves was used. Consistent with this interpretation, observe that on the whole central banks did not draw down their owned reserves, nor even draw very heavily on the bilateral swap lines. The existence of the swap lines, which operated as an increase in effective reserve capacity even when they were not drawn down, was sufficient to stabilize the

⁷ The 70 billion RMB swap line with Argentina is no exception, even though apparently it was used to acquire dollars by selling the RMB acquired through the swap (McDowell 2015, 29). The effect is to move reserves around, not to create additional reserves.

system. Thus, at both the top of the system and farther down, the role of swap lines was about supporting private sources of market liquidity that were imperiled by the crisis.

From this point of view, Figure 2 arguably provides a better headline image than Figure 1 for understanding the role of the global swap network in the emerging international monetary system. The system that seems to be emerging has the dollar remaining at the top, the C6 below that, and everyone else below that. This is the system that the next crisis will test.

Figure 2: The International Hierarchy of Money and Credit



Source: Bernes et al (2014)

The Private Liquidity System

The central institution of the world liquidity system is the offshore Eurodollar market.⁸ Here surplus agents accumulate dollar balances in the form of private bank liabilities, and deficit agents borrow dollars to meet present settlement obligations by committing to future settlement obligations. Banks that find themselves with net fund inflow can lend the excess to other banks that find themselves with net fund outflow, and the price of this wholesale borrowing and lending is LIBOR, the London Interbank Offer Rate (now undergoing some institutional change). The reserves of the Eurodollar system are deposits in other banks in New York which themselves have access to the Fed Funds market and ultimately the Fed's discount window, but the whole idea of the system is to operate without having to call on those reserves. To achieve this, offshore banks take seriously the maturity dates of both their liabilities and their assets, and use forward transactions of various kinds to match anticipated cash inflows and cash outflows so that the net is zero. Matched book is the name of the game, and matched book in dollars.

In practice, matched book for banks requires speculative book for someone else, who takes on the forward positions that the banking system as a whole is trying to shed. To the extent that this task involves private speculators, the fluctuating size of the required exposures pushes the forward rate around so that the speculators have a reasonable expectation of profit. This is important because it means that in general forward rates deviate from expected spot rates; that deviation is the source of expected profit for speculators. Put another way, the expectations hypothesis of the term structure, so beloved by economics textbooks and teachers, is incompatible with a system of private liquidity provision. (Similar processes of speculative arbitrage keep the offshore Eurodollar rate of interest connected to the onshore Fed Funds rate

⁸ The following analytical account draws heavily on the institutional detail provided by Stigum and Crescenzi (2007, 209-300).

but not in general equal to it. The direction of the inequality indicates which way net funds are flowing, or rather would be flowing if it were not for speculative traders taking the other side of the trade.)

In general, this system works efficiently to absorb liquidity shocks from whatever source, by expanding and contracting quantities of credit outstanding, while also shifting spot and forward rates, i.e. both quantities and prices. In effect, the Fed operates as a backstop for this flexible offshore private liquidity system, but that backstop is indirect. The direct backstop is onshore, where the Fed intervenes daily with the object to stabilize the domestic interbank Fed Funds rate around an announced policy target, and provides discount facilities at rates away from the market for deficit agents who are for any reason unable to find willing private lenders. Usually that indirect backstop is enough because, I repeat, the whole idea of the Eurodollar system, including now the speculative private dealers as an integral part of that system, is to operate without the central bank balance sheet.

Of course, all of this could in principle be done entirely onshore, as indeed it was in the glory days of Bretton Woods. In those days the United States was in effect bank of the world, borrowing short in dollars and lending long in dollars, providing both liquid balances and capital funding to the rest of the world (Depres, Kindleberger, Salant 1966). But both the US and the rest of the world became anxious about this system, as the resulting external liquid exposures grew to exceed domestic gold reserves. And so the fixed exchange system established at Bretton Woods came to an end in 1971-1973, but perhaps the most important consequence of that end was to make the nascent offshore Eurodollar system even more important. As that system continued to develop, more and more non-dollar currencies, having cut loose from the Bretton

Woods fixed rate system, got linked into the new system by means of an elaborate mechanism of foreign exchange.⁹

In a multiple currency world, deficit agents and surplus agents may well neither of them operate domestically in dollars, but nevertheless use the Eurodollar system to make payments to one another. Both therefore rely on connections between their own domestic money markets and world Eurodollar market to facilitate needed payments. Specifically, forward exchange allows hedging of unwanted FX risk exposure, both for non-financial clients and for domestic banking systems. In financially underdeveloped economies, forward exchange is typically a job for the central bank. In more developed economies, it is a job for markets and that means profit-seeking banks who match book as well as they can while relying on speculators to absorb (for a price) the net mismatch. Covered interest parity implies a forward exchange rate, and the fluctuating size of net exposures pushes the forward rate around so that speculators have a reasonable expectation of profit. This is important because it means that in general forward exchange rates deviate from expected spot exchange rates; that expected deviation is the source of expected profit for speculators. Put another way, uncovered interest parity, another idea beloved by economics textbooks and teachers, is incompatible with a system of private liquidity provision.

To fix ideas, Figure 3 shows a stylized example of how a deficit country might acquire needed dollars by relying entirely on the private FX dealing system.¹⁰ The first row shows the net positions of the two countries before settlement. The second row shows how the FX dealer system facilitates settlement by creating credit, specifically a spot dollar liability which we may suppose the deficit country buys from the dealer at the spot exchange rate using local currency, and then transfers to the surplus country, so cancelling its debt. Observe that the mechanism of

⁹ The following analytical account draws heavily on the institutional detail provided by DeRosa (2013).

¹⁰ The figure as well as the following three paragraphs are drawn from Mehrling (2013, 357-8).

settlement involves expansion of the dealer's balance sheet on both sides, and that this expansion exposes the dealer to exchange risk, namely the risk that the dollar price of its new FX asset might fall.

Figure 3: Private settlement

Surplus Country		FX Dealers		Deficit Country	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
\$10 due from					\$10 due to
-\$10 due from +\$10 spot		+\$10/s FX spot	+\$10 spot	-\$10/s FX spot	-\$10 due to
		+\$10 term	+\$10/s FX term		
		+\$10/s FX term	+\$10 term		

Source: Mehrling (2013, 357)

As a hedge against this price risk, the third row shows the dealer entering into an offsetting forward exchange contract, taking its cue from the covered interest parity condition by borrowing term FX and lending term dollars.¹¹ In this way our FX dealer achieves matched book—if the dollar value of its new FX spot asset falls, then so also will the dollar value of its new FX term liability. It does however still face liquidity risk since maintaining its hedge requires rolling over its spot dollar liability position until maturity of its term dollar asset position.

The fourth row shows the position of a second “speculative” trader, possibly a dealer, who provides the forward hedge to the first dealer. Crucially this second dealer does not have matched book and so faces exposure to exchange risk, but in the forward market not the spot market. (In practice he might hedge with a futures position, or an FX options position, but that doesn't eliminate risk, only shift it to someone else.) In effect, this second speculative dealer is

¹¹ Taking our own cue from CIP, we adopt the convention of booking forward transactions as a pair of term credits, lending in one currency and borrowing in another.

engaged in a carry trade, paying the dollar interest rate and receiving the FX interest rate. If the realized spot rate at maturity is different from the forward rate at inception, the speculation will make a profit or a loss.

In effect, Figure 3 shows how a deficit non-dollar country can in principle settle not with owned reserves but with borrowed reserves that are created for the purpose by an expansion of private credit. In principle this payment can be for anything, trade account or capital account, and can be offset by payments in the other direction for anything, trade account or capital account. This is important because it is the net exposure of the speculative dealer system that ultimately drives the forward exchange premium.

This is how the system works in normal times, and it is this system that comes under stress in abnormal times. During the financial crisis, that stress was so extreme that the system broke down. One symptom of the breakdown was a large and persistent spread between Eurodollar interest rates and domestic dollar rates, as pictured below in the so-called LIBOR-OIS spread. Another symptom of the breakdown was large and persistent violation of covered interest parity that normally connects the Eurodollar system with money markets in other currencies (Baba et al 2008, Griffoli and Ranaldo 2010). These were the breakdowns that the Fed was addressing with its \$600 billion central bank liquidity swap.

Figure 4: The LIBOR-OIS Spread

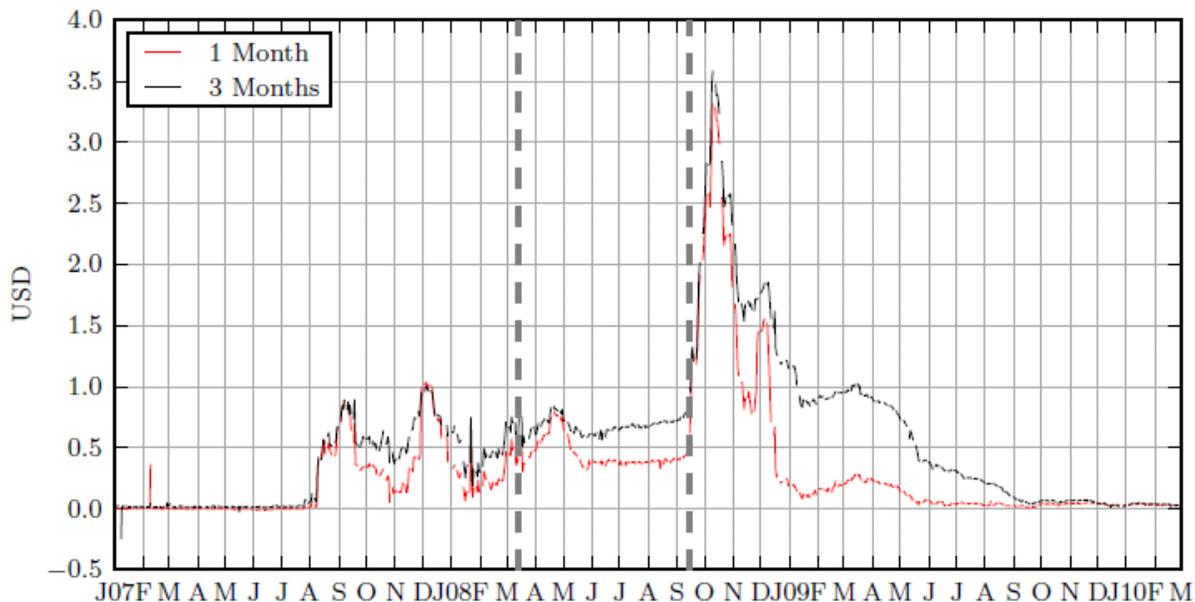
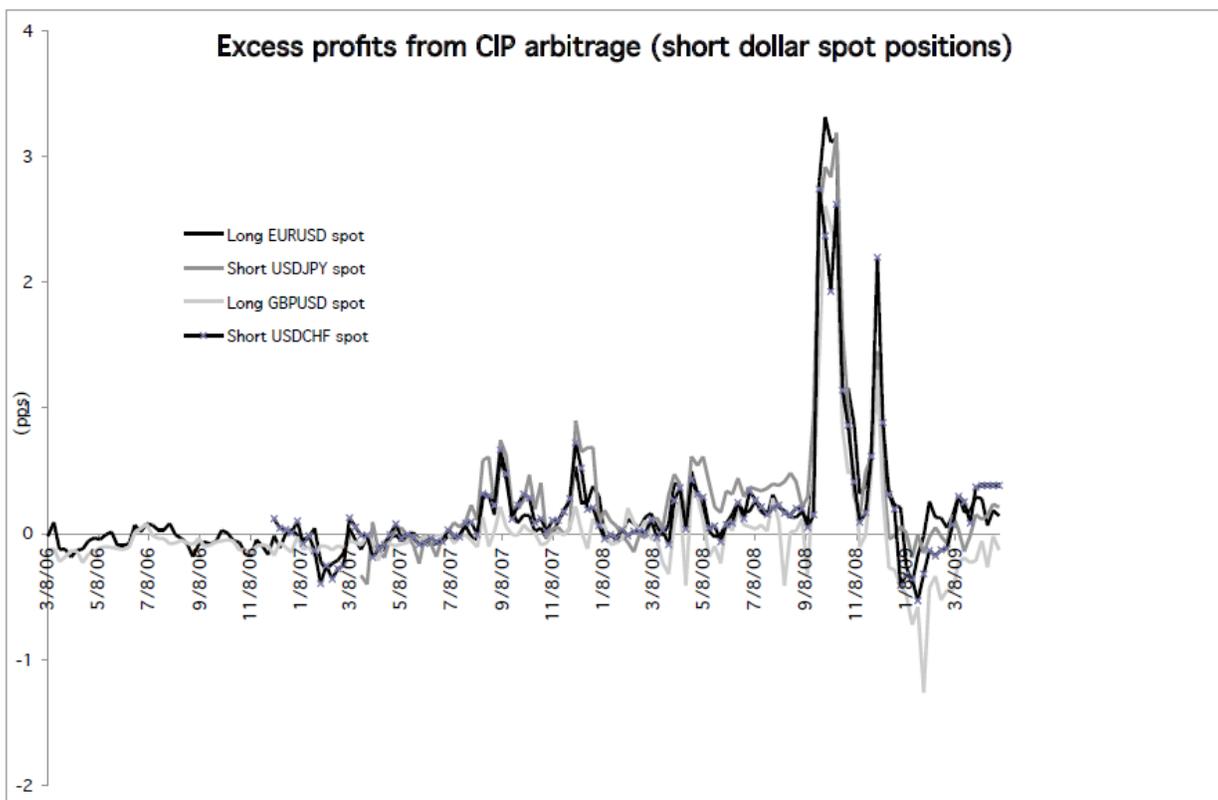


Figure 5: Breakdown of Covered Interest Parity



Source: Griffoli and Rinaldo (2010, Figure 2)

Central bank swaps are in some ways quite similar to a standard commercial FX swap, but the differences are important and significant. A standard commercial FX swap involves exchange of two currencies today at the spot exchange rate prevailing today, plus a promise to reverse the transaction at maturity using the forward exchange rate prevailing today. Suppose that the forward rate is calculated using covered interest parity as

$$F = S(1+r)/(1+r^*)$$

where r and r^* are respectively the dollar and foreign interest rate for a given term T , S is the spot exchange rate and F is the forward exchange rate for date T . In this case, the exposure of the swap contract is identical to a swap of IOUs between the contracting parties at the prevailing interest rates in their respective currencies. One party borrows dollars at rate r and the other party borrows euros at the rate r^* . But this exposure is exactly that shown in line four of Figure 3; the standard commercial FX swap is essentially a portfolio of forward FX positions. The key point to appreciate is that in general the spot rate at maturity will be different from the contracted forward rate, and that difference amounts to profit for one side of the contract and loss for the other. (In general the speculator expects to profit, and the hedger expects to lose.)

Central bank swaps are different. Most importantly the forward rate in the contract is usually exactly the same as the current spot exchange rate, and the interest rate on the contract is negotiated rather than calculated from market prices. The first difference means that central banks are never in the position of realizing profits or losses from the swap (although of course there will be implicit profits and losses). As for the second, given the choice of forward rate, the analogous commercial contract would call for payment of the interest differential, so anything different from that is significant. The documentation of the current C6 swap line leaves open the

question of who pays interest to whom, and how much. But the usual practice has been for the party who draws on the line to pay interest on the line at some penalty rate.

Just so, the May 9, 2010 swap agreement between the Fed and ECB called for the ECB to pay the USD Overnight Index Swap Rate plus 100 basis points on its dollar borrowing, and the Fed to pay nothing on its euro borrowing. In effect, the ECB was simply borrowing dollars at the discount window, like any other bank, but with its own monetary liability serving as collateral instead of some other financial asset. This kind of arrangement is still in effect a swap of IOUs—in effect the central bank exposure is that of the speculative dealer shown in line 4 of Figure 3—but at a price that is away from the market. Central bank swap lines thus offer a kind of outside spread, providing bounds within which normal commercial dealing takes place. So long as prices stay at or near CIP, private agents prefer to do business directly with each other. But when CIP breaks down, the central bank moves from backstop to market-maker, and the outside spread price becomes the market price.

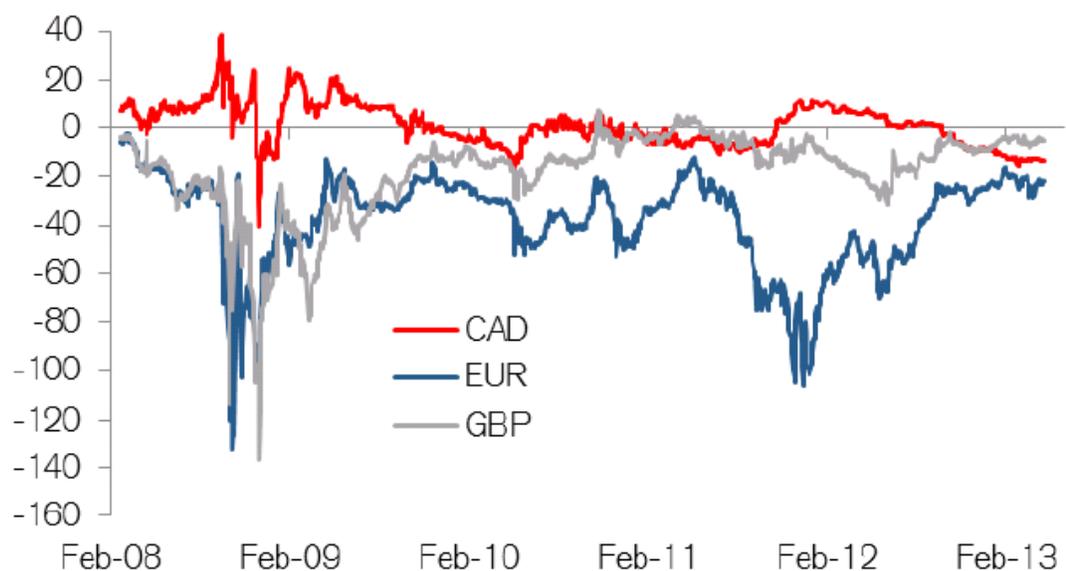
Before the crisis, commercial swap activity typically used the forward rate implied by CIP. But the crisis made everyone aware of the crucial assumption behind CIP that liquidity is a free or nearly-free good, an assumption that turned out to be an idealization, not a fact about the world. In the aftermath of the crisis, the market has responded by finding ways to price liquidity. For example, even before the crisis Cross-Currency Basis Swaps provided flexibility for deviation from CIP, originally with the idea of taking account of different credit risks for the different legs of the swap. As Chang and Lantz (2013) describe it, “in a standard CCBS, an investor would pay (receive) 3m USD LIBOR and receive (pay) the relevant 3m deposit rate in the other currency plus a spread.” I emphasize the last three words because strict CIP holds that the spread should be zero. What market participants have realized is that, although the spread

was originally intended to allow adjustment for credit risk between unequal contracting parties, it can also be used to adjust for anything else that investors care about, in particular relative funding stresses in the different currencies.

As a consequence, CCBS contract prices arguably now provide a sensitive barometer of payment imbalances in the global system. In Figure 6, the funding stresses of fall 2008 show up clearly as a negative spread, meaning that dollar borrowers are willing to accept less than market rate on the FX leg of the swap. But even in more normal times after the crisis was over, the barometer does not revert to zero, and it continues to fluctuate to reflect funding stresses in the global system such as the Eurocrisis period of 2012. These are the stresses that are backstopped by the new network of central bank swaps.

Figure 6: Cross Currency Basis Swap Spreads

1y cross-currency basis swaps vs. 3m USD LIBOR (spread in basis points)



Source: Chang and Lantz (2013, Exhibit 1)

Key Currencies and the Renminbi

So far as I can see, the global currency system is now and has been in the past a key currency system, organized around a dominant national currency. As Kindleberger has reminded us, “governments propose, markets dispose”¹². That was true of the Bretton Woods Agreement as much as any other subsequent agreement, though it took a while for the markets to dispose of Bretton Woods because in 1944 there were no markets. But over time markets have confirmed John Williams’ contemporary criticism of the Bretton Woods Agreement: “I cannot escape the conclusion that in the beginning the experts, even those advocating the Clearing Union, failed to see the nature of the problem and were proceeding on the assumption that in setting up an ‘international’ system, as distinct in their view from a ‘key currencies’ system, there would somehow result a general interconvertibility between each currency and every other” Williams (1947, lxx). What we got when all the dust settled was a key currency system. Governments propose, markets dispose.

Cohen and Benney (2013) argue forcefully that, notwithstanding a series of historical rivals to the dollar and the large number of prominent commentators who today claim to see an emerging multipolar world, “in reality the global system today is dominated in varying degrees by just two currencies: the dollar and the euro. This is a pattern that has persisted for more than two decades... Though the yen, pound sterling, and Swiss franc are used widely enough to warrant separate mention, they are clearly no more than ‘also-rans’ in the international currency race” (p. 15). But this way of putting matters is too strong. The dollar that dominates is the Eurodollar, a private liability of global banks not the public liability of a central bank. And the fact that the dollar is on one side of so many FX transactions, both spot and forward, more

¹² Among other places, in his 1975 essay “The SDR as International Money” reprinted in Kindleberger (1981, 69).

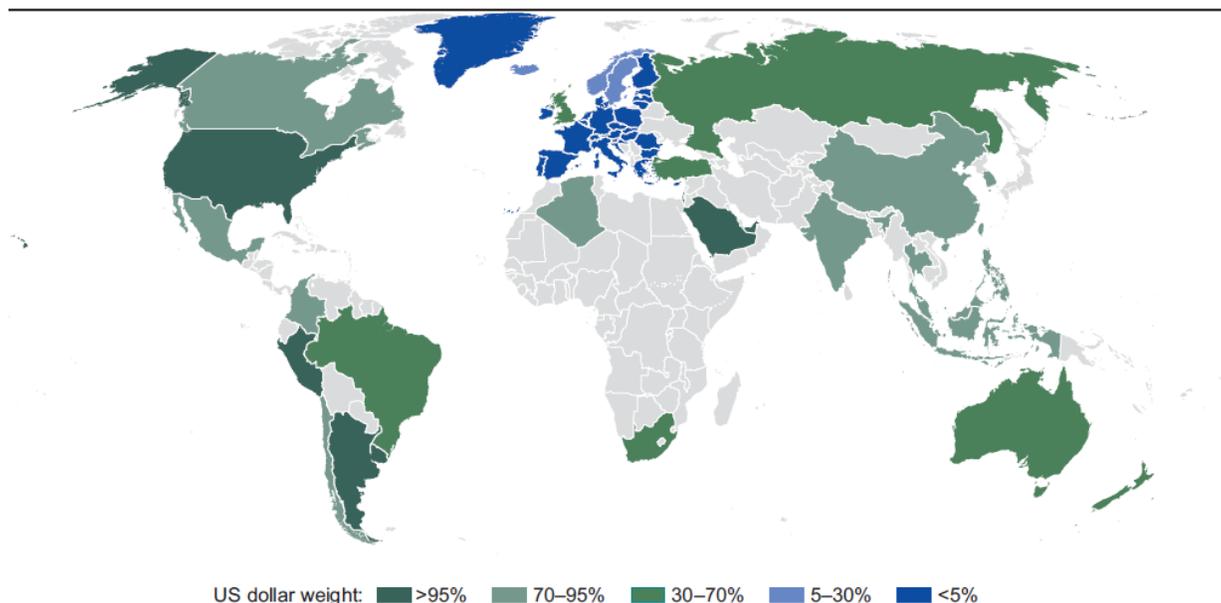
properly should be interpreted as a measure of the degree to which other countries have achieved sufficient financial development to link in to the international money market.

A recent BIS study gets it more right. They measure co-movement of exchange rates, and conclude that the world is essentially divided into two blocs, with everyone else connected more or less tightly through exchange markets. One implication of this observation, though the BIS does not itself draw the conclusion, is that international stability relies crucially on stabilization of dollar-euro exchange. Of the six swap lines that knit together the top of the system, the most important is that between the ECB and the Fed. (Historians will recall that at Bretton Woods, the key issue was to find mechanisms to manage the relationship between the pound sterling and the US dollar. See Gardner 1956.)

Figure 7: The International Currency System

Dollar zone in green larger than euro zone in blue

Graph V.A



Source: BIS calculation based on average elasticities of the national currency's dollar exchange rate with respect to euro/dollar and yen/dollar rates for 2011-14, inclusive.

Where is the renminbi in all this? Cohen and Benney (2013, 16) pull no punches: “Overall, the yuan remains a midget among international currencies, despite all the hype lately about an emerging tripolarity.” But once again this is too strong. First of all, as everyone knows, the People’s Bank of China is currently the largest single holder of dollar reserves in the world. Its network of 32 swaps (and counting) currently amounts to a credit line of 3.1 trillion yuan (about \$500 billion). Five of these swaps connect the RMB with the C6 at the top of the international hierarchy, every major central bank except the Fed. All the rest connect the RMB with significant trading partners farther down the hierarchy. These are local currency swaps, which allow partners to economize on international reserves and also operate to some extent to create offshore demand for RMB reserve holding, which is a policy goal of China. But that has not prevented some partners from using the swaps to gain dollar reserves, as apparently Argentina has done. After all, RMB now trade in offshore markets, and the ability of the PBoC to support the dollar value of the RMB is hardly in question, given its massive dollar reserves.

Second, the Chinese swap network has to some extent replaced the prior swap network of the Chiang Mai Initiative (Grimes 2008) which has graduated into a liquidity pool of \$240 billion, and been renamed Chiang Mai Initiative Multilateralization. The ten members all have access to this common pool, though IMF surveillance and so also conditionality applies for anyone who draws substantially on it. From the perspective of this paper, the importance of CMIM is that it expands the effective reserve backstop of each of the member central banks, and so the ability of each of them to backstop the evolving private links with the international monetary system (and hence the link of local currency with the dollar and/or euro), as each climbs the ladder toward increasing financial development.

Third, the 2014 BRICS bank initiative, and in particular the Contingent Reserves Arrangement, with pledged resources of \$100 billion, basically promises to do for much of the rest of the world what CMIM already does regionally. And so again, though the bank has yet to start business, from the perspective of this paper the importance of CRA is that it expands the effective reserve backstop of each of the member central banks, and so the ability of each of them to backstop the evolving private links with the international monetary system.

All three of these developments, along with the evolving network of EME bilateral swap arrangements, look to many observers like the initial stages of a move to replace dollar dominance in the international monetary system. My view is different. The global currency system is now and has been in the past a key currency system, organized around a dominant national currency, and so it will remain in the future. From this perspective, recent developments look more like building the institutional connections to bring peripheral economies and their developing financial systems into the international monetary fold.

As for the future of the RMB, it is instructive to compare the experience of the Euro, which has its origins back in the European Payments Union that preceded the return to convertibility in 1958 for each of the constituent currencies. That's where a lot of the rest of the world is now, in terms of financial development. The creation of a quasi-fixed rate European Monetary System within Europe did not come until 1979, and the common currency did not come until 1999. And even today, the euro exists in a dollar-dominant world system, albeit linked in at the core not the periphery. The euro did not replace the dollar; in effect it replaced the pound, which at Bretton Woods was the most significant core partner of the dollar.

Is this historical analogy good news or bad news for Chinese ambitions to see the RMB achieve key currency status? Maybe bad news, insofar as apparently there is a very long way to

go, and it can be expected to take time measured in decades, not years. Maybe good news, insofar as China is not recovering from world war but already possessed of the second largest economy in the world, albeit one that remains significantly underdeveloped in the financial sphere.

For me, the bottom line is neither good nor bad. The bottom line is about a realistic appreciation of how the existing system actually works, a realistic appreciation of where the RMB currently fits into that system, and so a realistic appreciation of the prospects for improving that fit in the future.

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