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“Where’s my swap line?” „Wo ist meine Swap-Line?“

A Money View of International Lender of Last Resort

Ein internationaler *Lender of Last Resort* aus Sicht der *Money View*

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Abstract: The past two decades have seen the construction of a tiered system of international liquidity provision, the first tier including those whose credit is sufficient for a swap line with the Fed, the second tier including those who can offer acceptable collateral to the Fed, and the third tier including everyone else. It is a global dollar system, with the Fed operating de facto as the global central bank providing international lender of last resort support to the system. It is a system created not so much by conscious design, but rather as a pragmatic response to crisis, bit by bit over time.

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It has been some 20 years since Stanley Fischer, then First Deputy Managing Director of the IMF, pointed out that a world with international capital mobility needs an international lender of last resort for countries facing an external financing crisis, going farther to suggest that the IMF might itself possibly play that role despite the fact that the IMF is not a bank and so is unable to create money.¹ Nonetheless it could, so he argued, help its members by lending from the resources already available to the IMF, and it could also potentially create new

¹ S. Fischer, On the Need for an International Lender of Last Resort, in: Journal of Economic Perspectives 13/4, 1999, pp. 85-104.

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international reserves in the form of Special Drawing Rights (SDRs).² Fast forward 20 years, effective August 23, 2021, the IMF has extended \$650 billion in new SDRs, about \$275 billion of which goes to emerging markets and developing countries, an allocation intended to help with external financing crises caused by the Corona Crisis.

Meanwhile, on a separate track, the world has seen the emergence of a rather different system of international lender of last resort, organized as a network of central bank liquidity swap lines largely limited to the core countries of the Global North. In this system central banks swap their own currency for dollars, which they then on-lend to their own banking systems as needed.³ During the Global Financial Crisis of 2008-2009, the US Fed lent almost \$600 billion in this way, and in the March 2020 coronavirus *dash for cash* it lent almost \$500 billion. More recently, the Fed's new standing FIMA repo facility,⁴ established July 28, 2021, allows additional foreign and international monetary authorities to swap their holdings of US Treasury securities for dollar reserves, which they can on-lend as needed.⁵ Unlike the IMF, the Fed is in fact a bank able to create money by expanding its balance sheet on both sides, and unlike the IMF's SDR the Fed's dollar liabilities are immediately spendable to meet external financing crises.

The past two decades have thus seen the construction of a tiered system of international liquidity provision, the first tier including those whose credit is sufficient for a swap line, the second tier including those who can offer acceptable collateral, and the third tier including everyone else. It is a global dollar system, with the Fed operating *de facto* as the global central bank providing international lender of last resort support to the system. It is a system created not so much by conscious design, but rather as a pragmatic response to crisis, bit by bit over time. What follows is an attempt to sketch the economic logic of

² See also *B. Eichengreen*, Reflections on Financial Instability and Need for an International Lender of Last Resort, in: *Mershon International Studies Review* 41/2, 1997, pp. 340-345 for a review of the contemporaneous academic literature on financial instability caused by "rational herding" which motivates the need for an international lender of last resort, and *M. De Cecco*, The Lender of Last Resort, in: *Economic Notes (Banca Monte dei Paschi di Siena)* 28/1, 1999, pp. 1-14, who emphasizes spillover from excessive domestic US LOLR to the rest of the world, with a focus on Europe and prospects for the new euro.

³ *P. Mehrling*, Discipline and Elasticity in the Global Swap Network, in: *International Journal of Political Economy* 44/4, 2015, pp. 311-324; *C. Schenk*, Central Bank Cooperation and US Dollar Liquidity: What can we learn from the past? Per Jacobsson Lecture, Basel: Bank for International Settlements, 2020, <https://www.bis.org/events/pj-2020-fulltext.pdf>, 03.02.2022.

⁴ Foreign and International Monetary Authorities (FIMA) repurchase agreement facility.

⁵ *D.H. Neilson*, Administering a global Dollar. The Fed's new standing Facilities, 2021, <https://neilson.substack.com/p/administering-global-dollar>, 03.02.2022.

the new system as it now appears, using the framework of the *money view* which sees banking first as a payments system, and second as a market-making system.⁶

1 Banking as a Payments System

To fix ideas, it is helpful to have in mind an idealized One Big Bank system, which everyone uses to make payments to everyone else. Surplus agents, who receive more payments than they make, build up positive balances (or pay down negative balances) while deficit agents, who make more payments than they receive, build up negative balances (or draw down positive balances), all of which causes the Bank’s balance sheet to expand and contract elastically, depending on the pattern of surpluses and deficits. In such a world, lender of last resort comes into play only when a deficit agent exhausts his overdraft line of credit and so cannot make further payments until he replenishes his liquidity, either by borrowing or by selling an asset, both of which require some other willing agent to serve as counterparty. Note that, in this world, liquidity is entirely a matter for individual agents, not at all for the One Big Bank, and it is hard to distinguish liquidity from solvency. Nevertheless, we start here because this is apparently the intuitive idealization for most economists, the implicit monetary and financial dual to idealized intertemporal general equilibrium.

Contrast this One Big Bank system with a Decentralized Bank system, in which multiple banks offer payment services to retail customers. Payments between customers of the same bank can work just the same as the Big Bank system, but payments between customers of different banks are a different matter. A clearinghouse goes some way to solve the problem, netting payments from each member bank to and from other clearinghouse members, but there is still the problem of settling the net. Here we find the origin of the wholesale money market in which surplus banks lend to deficit banks at a market-determined rate of interest. In this world, a natural concept of liquidity arises from the institution of payment clearing. A bank is liquid to the extent that it is able to meet its obligations to its counterparties at the clearing.

The settlement constraint in this Decentralized Bank system also gives rise to a natural concept of lender of last resort. When deficit banks borrow from surplus banks, what they are borrowing and promising to repay is means of

⁶ See for example *P. Mehrling, The New Lombard Street. How the Fed Became the Dealer of Last Resort*, Princeton 2011.

payment, in principle the liability of a bankers' bank, typically termed *reserves* to distinguish it from the means of payment between bank customers lower down in the monetary hierarchy, i.e. bank deposit liabilities. If a deficit bank is unable to find a surplus bank willing to lend from its own reserve holdings, for whatever reason, the bankers' bank can in principle solve the problem by expanding its own balance sheet on both sides, creating new reserves and lending them. This process we may take to be the essence of lender of last resort from a *microeconomic* point of view, a liquidity operation that enables current settlement by stepping in between the illiquid deficit agent and its counterparties.

This point of view also gives rise to a natural conceptualization of financial crisis as a generalized breakdown in the wholesale money market. In a crisis, surplus banks may be quite generally unwilling to lend to deficit banks, preferring to safeguard their owned reserves for themselves, and as a consequence generalized breakdown of the payments system threatens. However, so long as the surplus banks remain willing to lend to the bankers' bank, which is to say willing to accept the liabilities of the bankers' bank as means of payment, the bankers' bank can put a floor on the crisis by standing in between the deficit banks and surplus banks quite generally, in effect taking the collapsing wholesale money market onto its own expanding balance sheet. This process we may take to be the essence of lender of last resort from a *macroeconomic* point of view.

I have noted the emergence of a wholesale money market rate of interest as the price that deficit banks pay to surplus banks in return for putting off settlement to some future date. In principle this is a market price, determined by the pattern of deficits and surpluses both current and expected, which therefore changes over time. It is, we may even say, a kind of sufficient statistic for the degree of stress in the payments system, and perhaps also incentive for deficit agents to address their liquidity position.

The price charged by the lender of last resort, by contrast, is not a market price but rather an administrative price. The classic Bagehot Rule recommends that in crisis the lender of last resort should lend freely at a high rate against security that would be good in normal times. In a generalized breakdown of the money market, this administrative price takes the place of the market price, but the idea is that once the crisis is past the market price will reemerge as a more attractive alternative. To encourage this, the lender of last resort charges deficit banks a higher rate, and perhaps also offers surplus banks a lower rate, than the market eventually will. In effect, the central bank offers a bid-ask spread that straddles the normal market price. Deficit and surplus agents who meet during the crisis only on the balance sheet of the lender of last resort will thus have an

incentive, once the crisis is over, to meet instead directly in the wholesale money market.

In this way of understanding, in normal times the central bank (acting as a bankers’ bank) can stand away from the money market, allowing the market rate to signal the prevailing general liquidity conditions, offering its balance sheet only to individual deficit agents at a *penalty* rate over the market rate in order to isolate merely microeconomic troubles and prevent them from ramifying. In crisis times, however, market rate spikes above the central bank’s administrative rate, and the central bank steps in, offering its own balance sheet as a temporary substitute for the failing money market, temporary because once the crisis subsides the money market will replace the central bank balance sheet.

In both microeconomic and macroeconomic lender of last resort, because the central bank is offering its own balance sheet, it is naturally concerned about the ability of borrowers to repay their loans. Here we find the origin of tiering. In principle, the central bank is concerned about both sides of the borrower’s balance sheet, examining them for signs that the payment flow imbalance that has produced the deficit will soon reverse, i.e. the problem is liquidity, not solvency. (In some cases, the central bank may require explicit security in the form of collateral, and so may also be concerned about the liquidity of the collateral.) The essence of lender of last resort being a time shift in the settlement constraint, the central bank freely takes on liquidity risk, but not credit risk; it lends to the illiquid not the insolvent.

In all of the above, it will be noted, we have been focusing single-mindedly on banking as a payments system, with the aim of clarifying concepts. But of course the banking system is more than just a payments system, and these other elements add further complications. Most important, banks use their deposit liabilities to fund longer term lending and securities holding on the asset side of their balance sheets. Even more, once there is a money market, banks can systematically expand their asset holdings beyond their deposit base, depending on wholesale rather than retail funding of their loan book on margin, even as other banks systematically lend less than their deposit base, depending on the money market as an outlet for their surplus funds on margin. (Concretely, think here respectively of money center banks and small town banks.) Deficits and surpluses thus arise not merely from the day-to-day fluctuation of the pattern of payments but rather from systematic business strategies, and it follows that breakdown of the money market threatens not only the operation of the payment system but also the operation of the credit system more generally. Lender of last resort thus supports the credit system as well as the payments system.

2 Banking as a Market-Making System

Indeed, by contrast to the money view, the usual justification for lender of last resort places emphasis on the *credit channel* rather than on payments, worrying that deficit (money center) banks will cut back on their lending as a way of meeting the binding settlement constraint, with negative consequences for aggregate demand and hence employment.⁷ In recent years, bank lending has declined in importance relative to market-based credit – so-called *shadow banking* which we may define as money market funding of capital market lending – and the most recent financial crises have largely stemmed from this new system.⁸ Because the credit channel remains in principle more or less the same, the usual justification for lender of last resort has been taken to apply equally to this new system. From a money view standpoint, however, there is something more basic at stake. Disruption of money market funding disrupts the rollover funding of *existing* capital market lending, not just new lending, so possibly forcing liquidation at fire sale prices and destabilizing other balance sheets.

To understand this source of stress, and hence to understand the implications for lender of last resort, it is crucial to focus not on the lenders and borrowers but rather on the dealers, or market-makers, who supply liquidity on both sides of the shadow bank balance sheet, both money market funding and capital market lending. They do so by offering trading options, to buy or to sell, and then allowing their own balance sheets to absorb the resulting order flow.⁹ Motivated as they are by profit, they quote a lower price for buying than for selling, and a higher yield for lending than for borrowing, and they adjust both prices as a way of controlling order flow and the resulting risk exposure, whether short or long. The liquidity they supply is so-called *market liquidity* – the ability to buy or sell in volume without moving the price very much – and *fund-*

7 B. Bernanke/M. Gertler, Inside the Black Box: The Credit Channel of Monetary Policy Transmission, in: Journal of Economic Perspectives 9/4, 1995, pp. 27-48.

8 P. Mehrling et al., Bagehot was a Shadow Banker: Shadow Banking, Central Banking and the Future of Global Finance, in: S. Claessens et al. (Eds.), Shadow Banking within and across Borders, New Jersey 2014, pp.71-98. Also available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2232016, 03.02.2022.

9 J. Treynor, The Economics of the Dealer Function, in: Financial Analysts Journal 43/6, 1987, pp. 27-34; L. Harris, Trading and Exchanges, Market Microstructure for Practitioners, New York 2003.

ing liquidity – the ability to finance the holding of a capital asset by borrowing, perhaps using that capital asset as collateral.¹⁰

The important point to appreciate is that sellers and buyers, borrowers and lenders, transact on the margin not directly with each other but rather with a dealer, and the liquidity that these customers enjoy comes from the willingness of dealers to absorb temporary imbalances in final supply and demand on their own balance sheets, for a price. Importantly, that price is a market price, and so fluctuates with the pattern of supply and demand mismatch. Through this channel, market stress can move asset prices around quite a bit, in particular pushing them away from so-called *fundamental* value, as dealers move prices in response to order flow. Even so, dealer capacity to absorb imbalances is not infinite, and when that capacity is exhausted liquidity can disappear or, which is the same thing, the market price of liquidity can spike. In such a moment, desirous sellers can find no buyers, and desirous borrowers can find no lenders, because dealers have stopped making markets.

If this kind of disruption were a matter only of some overextended professional speculators getting their comeuppance we might perhaps welcome a bout of forced liquidation as a healthy dose of discipline. The problem though is that the same money market that shadow banks use to fund their positions is also used by regular banks to manage their fluctuating net payment flows, deficit banks borrowing from surplus banks. And that means that disruption of the money market disrupts also the payments system, which inevitably brings a call for lender of last resort. Of course, the underlying problem is not actually a payments imbalance, rather exhaustion of dealer market-making capacity. What is needed therefore is not lender of last resort but rather dealer of last resort, a balance sheet able to absorb temporarily the imbalance in supply and demand that has overwhelmed the private liquidity providers.¹¹ In a market-based credit system, it is the market – the money market and also potentially the capital market – that requires support, not so much individual banks.

Just so, trial by fire in the 2008-2009 Global Financial Crisis (GFC) resulted in an implicit updated Bagehot Rule that can be seen also to have guided central bank intervention in the 2020 Corona Crisis.¹² In both cases, the Fed used its own balance sheet to make markets, not only money markets but also crucial

¹⁰ M. Brunnermeier/L. Pedersen, Market Liquidity and Funding Liquidity, in: Review of Financial Studies 26/2, 2009, pp. 2201-2236.

¹¹ Mehrling, Lombard Street.

¹² *Idem*, Three Principles for Market-Based Credit Regulation, in: American Economic Review Papers and Proceedings 102/3, 2012, pp. 107-112.

segments of capital markets. In the GFC, ultimately the Fed did its own money market funding of capital market lending, acquiring residential mortgage backed securities by expanding its own reserve liabilities. And in the Corona Crisis, it extended similar support to corporate bonds at a price sufficiently unattractive that it got few takers, but which nonetheless provided potential support that encouraged dealers to step in themselves.¹³ Here we find the Fed operating an updated version of the Bagehot Rule, offering to buy freely but at a low price, above fire-sale levels but below the price that the market will eventually set when life returns to normal.

Dealers make money by buying low and selling high, and by adjusting both prices to control risk exposure from the resulting order flow. By contrast, a central bank operating as dealer of last resort is not trying to make money, only to bear liquidity risk, but it definitely wants to avoid losing money and that means avoiding price risk. Inevitably this leads to tiering, favoring operations in government and government-backed securities of various types, and requiring others to take the first loss on any other assets that the central bank may from time to time find itself accepting. Here we find the analogue to the Bagehot Rule's "securities that would be good in normal times".

For completeness, we may summarize the updated Bagehot Rule as follows:

1. Markets, not institutions; meaning money and capital markets, not credit intermediaries.
2. Outside spread, not inside spread; meaning a bid-ask spread that straddles non-crisis market prices.
3. Core, not periphery; meaning liquidity risk, not solvency risk.

One reason for the rise of market-based finance is that securities travel better than loans, which means that market-based finance is the natural form of banking for a globalized credit system. Historically, it all began with US mortgage-backed securities funded in US money markets, albeit booked offshore in European banks and in supposedly bankruptcy-remote Structured Investment Vehicles.¹⁴ This is the system that got tested in the GFC. The fact that the Fed ultimately stood behind this system subsequently encouraged its extension globally once the crisis was over, with national corporate champions in the Global South tapping global dollar capital markets, these assets then being

13 S. Aramonte/F. Avalos, *The recent Distress in Corporate Bond Markets: Cues form ETFs*, in: BIS Bulletin 6, 2020, pp. 1-7.

14 J.J. McConnell/S.A. Buser, *The Origins and Evolution of the Market for Mortgage-Backed Securities*, in: Annual Review of Financial Economics 3, 2011, pp. 173-192.

funded on margin in global dollar money markets, much of the action taking place outside the US.¹⁵ Today, the market-based dollar credit system is global, the credit superstructure built on the global dollar payments system. Such an international system requires an international lender of last resort.

3 International Lender of Last Resort

Kindleberger was an early, and for a long time lonely, worrier about (and warrior for) international lender of last resort.¹⁶ The main reason that the Great Depression was so deep and so long, he argued, was that the global monetary and financial system was at that time in the midst of switching from a sterling base to a dollar base, Britain no longer able to serve as international lender of last resort and the US not yet willing to do so, so that there was no one to put a floor on the crisis. Fast forward to the last days of Bretton Woods, Kindleberger worried that the rise of the offshore Eurodollar system had created a new vulnerability to crisis as the global dollar was increasingly outside the control of the ultimate issuer of dollars, the US Fed. The solution, so he proposed, was internationalization of the control mechanisms of the increasingly global dollar system, perhaps starting small by adding international representation on the Federal Open Market Committee (FOMC), but eventually shifting to the Bank for International Settlements (BIS) as a non-national global central bank operating in the offshore Eurodollar market.

The problem of international lender of last resort, as Kindleberger saw it, was not so much technical as it was political. As a technical matter, the Fed might well have been able and even willing to serve, but longstanding US political traditions stood in the way.¹⁷ That’s what lies behind Kindleberger’s proposal to use the BIS instead, as a possibly acceptable non-political alternative.

15 I. Aldasoro/T. Ehlers, The Geography of Dollar Funding of non-US Banks, in: BIS Quarterly Review, 2018, pp. 15-26, https://www.bis.org/publ/qtrpdf/r_qt1812b.htm, 04.02.2022.

16 C.P. Kindleberger, Power and Money: The Economics of International Politics and the Politics of International Economics, New York 1970; *Idem*, The World in Depression, 1929-1939, Berkeley 1973; *Idem*, Manias, Panics and Crashes: A History of Financial Crises, New York 1978.

17 Indeed those traditions had been written into the Federal Reserve Act that created the Fed. The three bogeymen of American politics – Big Finance, Big Government, and the Big Wide World – come together in a global central bank, which founders were therefore quite careful to rule out by delimiting the scope of the new Fed; P. Mehrling, Economists and the Fed: Beginnings, in: Journal of Economic Perspectives 16/4, 2002, pp. 207-218.

Ever since 1961, the Basel swap lines had operated behind the scenes, originally to stabilize European currencies just returning to convertibility.¹⁸ Here Kindleberger found the seed of a possible eventual evolution toward global central banking more explicitly.

In this context, Stanley Fischer's call for IMF involvement can be seen as an updated attempt to solve the same political problem, now for an even more global dollar system that has stretched to include the Global South.¹⁹ Assuming that the Fed will never serve directly as lender of last resort to buffer the external financing constraints of the Global South generally, someone else will have to do it. The SDR may not be money, just a low cost line of credit, but the important thing is that the ultimate lender providing the credit is not the US but rather whichever nations serve as market-makers, trading their own dollar holdings for the SDRs that deficit nations wish to use to meet their external financing constraint. Just so, the voluble US support for the most recent SDR allocation can be seen as welcoming the shift of credit risk onto other shoulders.

Kindleberger was writing before the rise of market-based credit, and as a consequence his focus was on lender of last resort not dealer of last resort.²⁰ For him, the central bank swap network that was emerging at the BIS was simply a way of elastically supplying the ultimate international reserve, deposits at the US Fed, to the most systematically important counterparties. This the BIS continued to do after 1961 for quite a while, using its own balance sheet. But the Global Financial Crisis of 2008-2009 proved too much, requiring more direct support from the Fed in the form of central bank liquidity swaps, which were then made permanent in the succeeding Eurocrisis. It was these same swap lines that then stabilized global funding markets in the early days of the 2020 Corona Crisis.

The important point to appreciate is that in these more recent cases, the mechanism of stabilization went beyond elastic supply of the ultimate reserve, because the crisis involved the new market-based credit system, specifically the newly global offshore dimension of that system. In stabilizing global funding markets, the Fed was operating as global dealer of last resort.

18 C.A. Coombs, *The Arena of International Finance*, New York 1976.

19 S. Fischer, On the Need for an International Lender of Last Resort, in: *Journal of Economic Perspectives* 13/4, 1999, pp. 85-104.

20 C.P. Kindleberger, Intermediation, Disintermediation, and Direct Trading, in: S. Fazzari/D. Papadimitriou (Eds.), *Financial Conditions and Macroeconomic Performance: Essays in Honor of Hyman P. Minsky*, New York 1992, pp.71-84; reprinted as Ch. 15 in *Idem*, *Comparative Political Economy, A Retrospective*, Cambridge 2000, is the farthest he ever got in addressing this fundamental shift in the nature of global banking.

Table 1 shows a stylized version of the new dollar credit system that arose after the GFC to support funding for the Global South.²¹ Conceptually, capital market dollar borrowing was funded by term dollar borrowing in Asia, and that term dollar borrowing was funded by money market borrowing in Europe. (Completing the circuit, the Figure shows also accumulation of FX reserves in the form of money market funding by the central banks of the Global South.) A key mechanism for all of this was the FX swap, which Japanese investors (for example) used to convert Yen funding to dollars, and which French investors (for example) used to convert Euro funding to dollars. In theory, covered interest parity (CIP) determines the terms of these commercial FX swaps, but in practice it required a spread over CIP as incentive to bring forth adequate supply of the demanded currency hedges.²² And that spread, a kind of price of global dollar liquidity, fluctuated over time as a sensitive barometer of global funding conditions on margin.

Tab. 1: Global Dollar Market-based Credit.

Global South		Asia		Europe	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
\$ MM funding	\$ bonds, loans	\$bonds, loans	\$ term funding	\$term funding	\$ MM funding

Source: See footnote 21.

In this context, we can conceptually understand the Fed’s standing central bank swap facilities, priced at 50 basis points away from CIP, as a kind of outside spread supporting the commercial FX swap market between the dollar and other key currencies. (Note here the presence of all three elements of the new Bagehot

²¹ This figure is meant as a high-level abstraction from the detailed empirical tracking that has been the purview of the BIS, notably *Aldasoro/Ehlers*, Geography of Dollar Funding, as mentioned above, but see also *R. McCauley/P. McGuire/V. Sushko*, Dollar Credit to Emerging Market Economies, in: BIS Quarterly Review, 2015, pp. 27-41, https://www.bis.org/publ/qtrpdf/r_qt1512e.htm, 04.02.2022, especially Graph 1 and 2 on EME dollar credit; *H.S. Shin/P. Turner*, What Does the New Face of International Financial Intermediation Mean for Emerging Market Economies?, in: Banque de France Financial Stability Review 19, 2015, pp. 25-36, https://publications.banque-france.fr/sites/default/files/medias/documents/financial-stability-review-19_2015-04.pdf, 04.02.2022, and most recently *Committee on the Global Financial System*, US Dollar Funding: an International Perspective, in: CGFS Papers 65, 2020, pp. 1-81.

²² *C. Borio et al.*, Covered Interest Parity Lost: Understanding the Cross-Currency Basis, in: BIS Quarterly Review, 2016, pp. 45-64, https://www.bis.org/publ/qtrpdf/r_qt1609e.htm, 04.02.2022.

Rule: markets, outside spread, and also core because the Fed's counterparty is other central banks.) In non-crisis times, the market price of commercial FX swaps lies inside the central bank administered price, and as a consequence the liquidity swap facility lies unused. In crisis times, however, market prices easily blew through this limit because the facility was open to central banks not FX dealers themselves, which makes it all the more notable that in March 2020 mere announcement by the Fed that it was willing to allow on-lending to dealers, and at a tightened 25 bp spread, proved to be enough to stabilize swap prices.²³ This is dealer of last resort in the FX swap market, for those nations fortunate enough to have a swap line. Recall the formula for CIP: $F/S = (1+r)/(1+r^*)$, where F and S are forward and spot exchange rates, and r and r^* are dollar and foreign interest rates. The key point is that stabilizing the FX swap basis (the deviation from CIP) in effect stabilizes dollar money market funding conditions for the global market-based credit system. The central bank liquidity swap network thus operates in practice as a funding liquidity backstop.

What about market liquidity? Obviously the Fed is not going to provide market liquidity for the underlying dollar assets issued by the Global South, or indeed for any non-US credit. US government securities are fine, and under the stress of the GFC the Fed was willing to include also government-backed MBS, and under the stress of the Corona Crisis further willing to include certain corporate bonds. But this is all US credit, for which the Fed is explicitly and implicitly indemnified by the US Treasury. Market liquidity for other global issues, notwithstanding their denomination in dollars, is a matter instead for other global central banks, indemnified perhaps by their own Treasuries. Most important in the recent crisis were the issues of the Global South, which comprised the lion's share of global credit growth since the GFC. Significantly, in their response to the crisis, we find the central banks of the Global South intervened in a new way, absorbing domestic issues that were being dumped by global investors, acting in effect as dealer of last resort in their own corner of the global system.²⁴

It will have been noted that the empirical basis for this paper comes almost entirely from various BIS reports and analyses. My contribution is merely to use the analytical frame of the money view to connect the various empirical dots. So far as I can see, each individual dot has its origin in pragmatic measures taken by practicing bankers and central bankers to confront the crisis as they faced it

23 S. Avdjiev/E. Egeon/P. McGuire, Dollar Funding Costs During the Covid-19 Crisis Through the Lens of the FX Swap Market, in: BIS Bulletin 1, 2020, pp. 1-6.

24 Y. Arslan/M. Drehmann/B. Hofmann, Central Bank Bond Purchases in Emerging Market Economies, in: BIS Bulletin 20, 2020, pp. 1-7.

in their own back yard. No one was taking the viewpoint of the system as a whole, much less explicitly intervening to manage it. And yet the system held; the stress test posed by the Corona virus was passed. Pace Kindleberger, the BIS acted not so much as international lender of last resort, but rather as contemporaneous chronicler of the multifarious mechanisms that, together, added up to international lender of last resort. The key institution was instead the US Fed, operating through the multiple tiers described above.

The crisis having been met, the problem we now confront is how to manage the traverse from central bank balance sheets back to money markets, and from administrative pricing back to market pricing. It’s a big challenge, and important not to underestimate. In this respect, the money view frame for understanding how last resort lending works may offer some further help, by providing an analytical frame suitable more generally for making sense of the brave new world of the global dollar monetary and financial system. Toward this end, Figure 2 sketches the outlines of the present system, using the Treynor diagram of dealer economics as a stylized frame for determination of asset prices.²⁵

Treynor was concerned to understand how equity dealers set the (inside) bid-ask spread for individual stocks, backstopped in effect by the outside spread set by value investors who are willing to buy or sell in volume when the price is sufficiently far away from fundamental value. In Figure 2 we adapt his model for dealers in money and capital markets, where the relevant value investor backstop is the central bank serving as dealer of last resort. Moving from left to right, we move from overnight payments, to (three-month) money market funding, to (ten-year) capital market lending. Moving from top to bottom, we move from the United States, to the Global North core, to the Global South periphery.²⁶

The highlighted portions of the figure show the footprint of the Fed as global central bank. The Fed now clearly backstops the dealer function at all maturities within the United States (specifically putting a floor on bond prices through so-called quantitative easing (QE)), but only up to money market funding (using the FX swap lines) for the rest of the Global North, and only up to overnight payments (using the FIMA repo facility) for the rest of the Global South. (C6 here is meant as shorthand for the six key central banks of the Global North: the Fed, ECB, BoJ, BoE, BoC, and SNB.) The non-highlighted portions are the responsibil-

²⁵ *J. Treynor*, *The Economics of the Dealer Function*, in: *Financial Analysts Journal* 43/6, 1987, pp. 27-34.

²⁶ Thanks to Samantha Igo at Boston University’s Global Development Policy Center for translating my hand-drawn figure into this beautiful design.

ity instead of the other central banks in the Global North and South, and their associated Treasuries.

This is the system that has emerged from the most recent 2020 Corona stress test. The challenge now is to move from central bank market making and administrative pricing to private dealer market making and market pricing, supported by the new and newly integrated system of international lender/dealer of last resort. Key to the global traverse from central bank balance sheets back to money markets will be the local traverse within the United States from directly supporting capital markets back to merely targeting some overnight interest rate (likely the Secured Overnight Financing Rate, or SOFR). As of this writing (January 2022), the Fed remains in maximal elasticity mode, and overnight rates are therefore at the floor set by the Fed's administered rate on its Overnight RRP facility. But the Fed has signaled its intention to taper its bond purchase program and has put into place a new Standing Repo Facility (SRF) which will put a ceiling on overnight rates once tightening begins. In anticipation of that tightening, Figure 1 shows the target overnight rate in between the floor and ceiling, as part of the return to normal.²⁷

As the Fed tightens locally, expect dollar appreciation and credit tightening globally as well, as part of the global traverse back to normal. Prior to the Corona crisis, the BIS had for quite some time been warning of a possible EME debt crisis emerging endogenously as a consequence of the discipline phase of the global financial cycle. The massive dealer of last resort response to Corona has delayed that discipline for two years, but as we shift from central bank balance sheets back to money markets, the normal global financial cycle can be expected to return.²⁸ Central bank attention is therefore shifting from dealer of last resort to the management of normal cyclical fluctuation, but the last resort facilities that have been cobbled together in response to Corona remain in place as backstop to that global management effort.

²⁷ My understanding of the present institutional arrangements derives mainly from *Z. Pozsar*, Design Options for an o/n Repo Facility, in: Credit Suisse Global Money Notes 25, 2019, pp. 1-26 and *D.H. Neilson*, The Overnight Rate Complex. Repo and Reserves, 2021, <https://neilson.substack.com/p/overnight-rate-complex>, 04.02.2022.

²⁸ *B. Hofman/T. Park*, The Broad Dollar Exchange Rate as an EME Risk Factor, in: BIS Quarterly Review, 2020, pp.13-26.

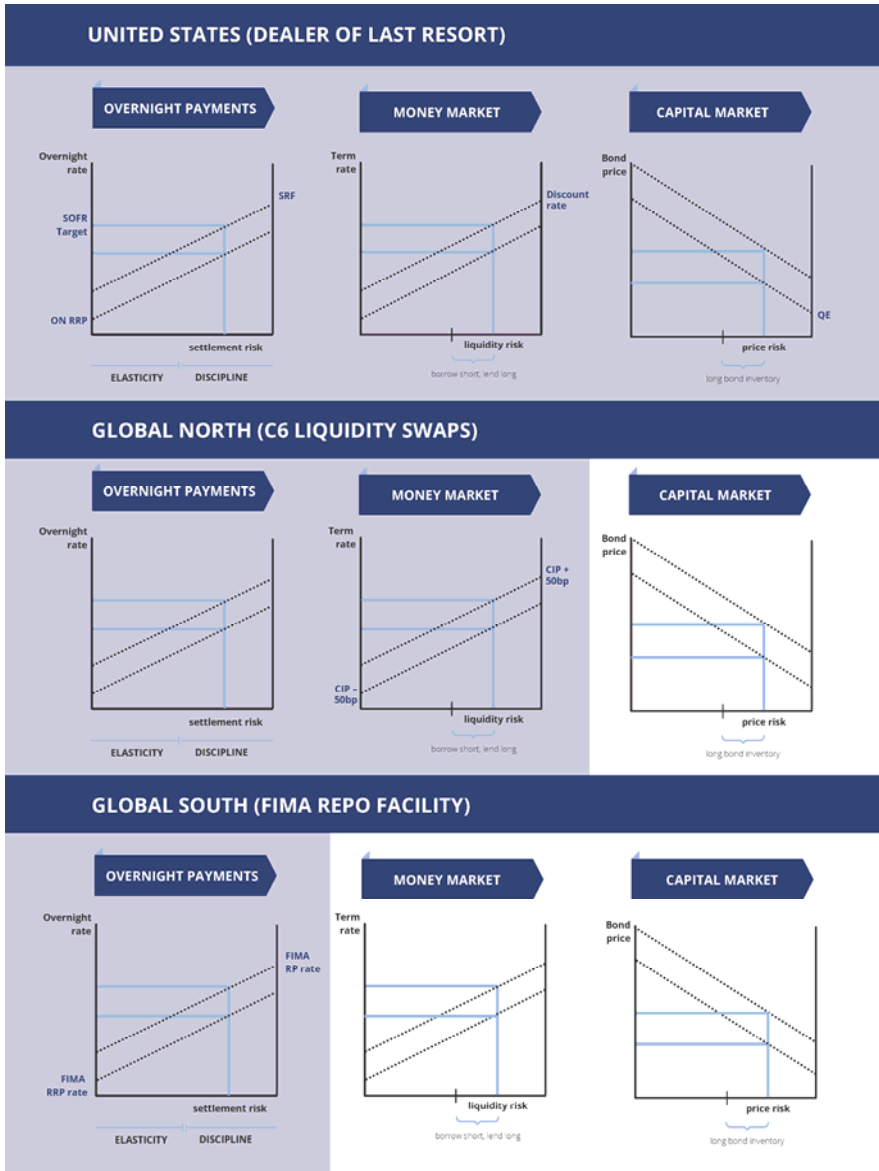


Fig. 1: Sample caption The Global Dealer System and LOLR/DOLR Backstop. Source: created by P. Mehrling (design: Samantha Igo).

Bionote

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