

# **Bagehot was a Shadow Banker:**

## **Shadow Banking, Central Banking, and the Future of Global Finance**

Perry Mehrling (Barnard College, Columbia University), Zoltan Pozsar (U.S. Treasury), James Sweeney (Credit Suisse), Daniel H. Neilson (Institute for New Economic Thinking)\*

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The modern shadow banking system, at its core, bears a surprising resemblance to the 19<sup>th</sup> century world that Walter Bagehot helped us to understand in his magisterial book Lombard Street: A Description of the [London] Money Market (1873). At the heart of both worlds is the wholesale money market, and operating as the crucial liquidity backstop in both worlds is the central bank. At the time Bagehot was writing, this backstop function was not yet fully understood, much less accepted; much the same could be said of the central bank's backstop of the shadow banking system today (Capie 2012). We are living today in a Bagehot moment, when the outlines of the new are just emerging from the ashes of the old.

During crisis, the central banks of Bagehot's time and our own both dutifully employed their balance sheets to stem the downturn. In both his time and ours they did so without much prior theory about why it would work, and with hardly any thought about possible implications for more normal times. The time for all of that would come later, after the crisis. Bagehot's book started the process of necessary rethinking for his own time by bringing out into the open how the Bank of England had acted during previous crises. We start the process of necessary rethinking for our own time by using Bagehot as an entry point for understanding the modern shadow banking system, and the Fed's response to the global financial crisis.

In doing so, we are conscious of taking a different approach to the subject than does most of the existing literature. For most authors, the important thing about shadow banking is the "shadow", the distinct whiff of illegitimacy that comes from regulatory evasion in good times combined with unauthorized access to the public purse in bad times. This is the origin of the widespread impulse to frame the question of appropriate oversight and regulation of shadow banking as a matter of how best to extend the existing system of oversight and regulation as it is applied to traditional banking. See for example the much-cited paper of Gorton and Metrick (2010), as well as the recent overviews by Adrian and Ashcraft (2012) and the Financial Stability Board (2012).

For us, by contrast, shadow banking is simply “money market funding of capital market lending”, sometimes on the balance sheets of entities called banks and sometimes on other balance sheets. As such, shadow banking is not some troubling excrescence on the healthy body of traditional banking. Rather, it is the centrally important channel of credit for our times, which needs to be understood on its own terms. From this vantage point, the question of appropriate oversight and regulation requires us to abstract from what we know about traditional banking, and to start instead by imagining a world in which shadow banking is the only banking system.

The defining role of markets, both money and capital markets, for our understanding of shadow banking directs attention to the central importance of prices, and also to the central importance of market-making institutions both for price discovery and for continuing secondary market liquidity. These institutions, relatively unimportant from the perspective of traditional bank loan-based credit, are both central and essential for modern capital market-based credit. When they are working well, the whole system works well; and when they stumble, the whole system stumbles. In what follows, we place them at the very center of analytical attention.

Figure 1 shows an idealized picture of the shadow banking system, which we might more neutrally call the “market-based credit system”. The “capital funding bank” is engaged in money market funding of capital market lending, hence shadow banking, specifically the funding of residential mortgage backed securities (RMBS). We imagine the risk in these securities being hedged in various swap markets—generically, credit default swaps, interest rate swaps, and foreign exchange swaps—so that the combined CFB asset position is essentially riskfree.<sup>1</sup> We further imagine this asset position being used as security for money market funding.

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<sup>1</sup> To avoid possible confusion, let it be noted that we adopt an “insurance” convention of booking swaps that strip out risk as contingent assets on their ultimate owners balance sheet, and hence also as contingent liabilities on the balance sheet of the counterparty to whom the risk is transferred. An alternative “investment” convention is also possible, which would instead book the risk exposure as an asset on the reasoning that it has positive expected return even if zero net present value at inception.

The “asset manager” is the mirror image of the capital funding bank, holding its capital in (secured) money form and enhancing the return on that capital by selective risk exposure in various swap markets—again generically credit default swaps, interest rate swaps, and foreign exchange swaps. Standing in between the asset manager and the capital funding bank are two types of market-makers, one the “global money dealer” whose dealing activities establish the price of funding, and the other the “derivative dealer” whose dealing activities establish the price of risk. These dealers will be the central focus of our analysis.

**Figure 1: A Market-based Credit System**

Capital Funding Bank		Global Money Dealer		Asset Manager	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
RMBS	MM funding	MM funding	“deposits”	“deposits”	Capital
CDS					CDS
IRS					IRS
FXS					FXS

Derivative Dealer	
Assets	Liabilities
CDS	CDS
IRS	IRS
FXS	FXS

In this stylized model, we abstract from counterparty risk because all funding is secured, and because all derivative positions are matched either by offsetting natural positions (such as RMBS for the CFB) or by reserves sufficient to make good even in the worst case scenario (“deposits” for the AM). Further, our dealers are matched-book dealers, with no net exposure to price risk, and thus with no need for capital reserves. Because their cash and collateral inflows and outflows are exactly matched, they have no need for liquidity reserves either. The only capital in the system, and the only deposit holding as well, are both on the balance sheet of the asset manager, which is as it should be since the

asset manager is the only agent facing any risk. (We will be relaxing these strong assumptions when we consider boom-bust dynamics in Section II.)

The stylized character of this model means that it cannot be expected to line up exactly with the institutional arrangements of current financial markets. Indeed, most large investment banks probably contain within their walls elements of all four functions. The value of the model is in helping us to make conceptual distinctions between these functions, both within given institutions and across institutions. Just so, for example, capital funding bank structures can be found on the balance sheets of most European universal banks, but also in off-balance sheet conduits of various kinds. Money market mutual funds might be considered global money dealers, but they are not the only ones. Pension funds might be considered asset managers, but also non-financial corporate treasurers and even synthetic Exchange-Traded Funds. Central counterparty clearinghouses might be considered derivative dealers, but so also is anyone running a bespoke swap book.

The main purpose of the model is to provide an overarching framework to make conceptual sense of the many moving parts of the market-based credit system. Most important, the model highlights the central importance of the dealers who make prices in money and capital markets. In doing so, we also uncover a link to the older Bagehot-era literature since, in effect, Bagehot's bill brokers were last century's version of the model's Global Money Dealers (Wood 2000). At the core of the modern-world credit system lies a bill funding apparatus quite analogous to the one Bagehot and his contemporaries were trying to understand, and to manage. For understanding and for managing our own system, we start from Bagehot.

## **I. Bagehot and Beyond**

Reading Bagehot, we enter a world where securities issued by sovereign states are not yet the focal point of trading and prices, as they would come to be in the 20<sup>th</sup> century. Instead, the focus of

attention is the private bill market, which domestic manufacturers tap as a source of working capital, and which traders worldwide tap to finance the movement of tradable goods. It is a market in short-term private debt, typically collateralized by tradable goods.

Supplying funds to the bill market were, among others, banks that purchased bills at discount from face value using their own deposit liabilities, typically planning to hold to maturity and redeem at par. The institution of “acceptance”, by which a bank or some other party guaranteed payment of a bill at maturity, was the way non-prime bills became prime. Backstopping the whole thing was the Bank of England, whose posted “Bank Rate” in effect put a floor on the price of prime bills; bank rate was usually somewhat higher than the market rate of discount. Banks whose immediate cash outflow (from deposit withdrawals) outran their immediate cash inflow (from maturing bills) could take their prime bill assets to the Bank of England for rediscount, and get cash for them. Normally, though, they could get a somewhat higher price by tapping the lively secondary bill market to find a private buyer. In normal times, the central bank backstop operated to support the market; only in crisis times did the central bank backstop become the market.

What has come down to us as the Bagehot Rule for stemming financial crisis—lend freely but at a high rate of interest—was originally about the Bank of England buying bills freely but at a low price. It should be emphasized, however, that the Bank could and did also make loans (“advances”) against bill collateral, and the Bank’s generous collateral valuations provided further support for market prices. Bagehot famously urged the Bank to accept as collateral “what in ordinary times is reckoned a good security” rather than attending to current market valuation. The point of all these measures was to prevent troubled banks from being forced to liquidate fundamentally sound assets at fire sale prices.

Figure 2 shows a stylized picture of how the discount system worked in Bagehot’s day. We show the Bank of England as the ultimate backstop for the system, rediscounting prime bills by using its own liabilities as a source of funds. Note well that the Bank of England takes in as assets both the underlying

bill and the acceptance which guarantees par payment at maturity. In principle, the Bank of England's risk exposure was supposed to be about when it would be paid, not about whether it would be paid, thus liquidity risk not solvency risk. The banks writing acceptances were supposed to be taking the solvency risk, so making up with their own capital any losses on the underlying bill.

**Figure 2: Bagehot's Lender of Last Resort**

Deficit Firm		Bank		Bank of England		Surplus Firm	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
	Bill		Acceptance	Bill	Deposit	Deposit	
				Acceptance			

What would Bagehot make of modern shadow banking?

On the surface, the modern system looks quite different. The closest thing we have to the institution of "acceptance" is the credit default swap (Mehrling 2010), but that does not so much guarantee eventual par payment as current par valuation. Just so, according to standard financial theory, the price of a "risk free" security = price of risky security + price of risk insurance. Further, the modern system is fundamentally a world of long term debt, which connects to the world of short term bills through the institution of the interest rate swap; in standard financial theory, the price of a short term security = price of long term security + price of interest rate swap. Finally, the modern system has dispensed with the gold standard of Bagehot's day, with the consequence that securities contain currency risk which can be stripped out using the institution of the FX swap; the price of a dollar security = price of foreign currency security + price of FX swap.

These differences from the world of Bagehot are significant but should not distract us from seeing that at the heart of his world, as ours, is the money market, and operating as crucial backstop in

both worlds is the central bank. Indeed, it could be said that the whole point of the various swaps is to manufacture prime bills from diverse raw materials. Putting together all the equations in the previous paragraph, we can distinguish the various stages of manufacture:

$$\begin{aligned}
 \text{Price of "risk-free" prime bills} &= \text{price of risky security} \\
 &+ \text{price of risk insurance} \\
 &+ \text{price of interest rate swap} \\
 &+ \text{price of FX swap.}
 \end{aligned}$$

At its core, modern shadow banking is nothing but a bill funding market, not so different from Bagehot's. The crucial difference between his world and ours is the fact that Bagehot's world was organized as a network of promises to pay in the event that someone else doesn't pay, whereas our own world is organized as a network of promises to buy in the event that someone else doesn't buy. (That's what the swaps do, in effect.) Put another way, Bagehot's world was centrally about funding liquidity, whereas our world is centrally about market liquidity (Brunnermeier and Pederson 2009), also known as "shiftability" (Moulton 1918).

What accounts for the shift from Bagehot's time to our own? The key reason seems to be that in today's world so many promised payments lie in the distant future, or in another currency. As a consequence, mere guarantee of eventual par payment at maturity doesn't do much good. On any given day, only a very small fraction of outstanding primary debt is coming due, and in a crisis the need for current cash can easily exceed it. In such a circumstance, the only way to get cash is to sell an asset, or to use the asset as collateral for borrowing. In the private market, the amount of cash you can get for an asset depends on that asset's current market value. By buying a guarantee of the market value of



your assets, in effect you are guaranteeing your access to cash as needed; if no one else will give you cash for them, the guarantor will.

That, in effect, is what all the swaps are doing, or at any rate what they are trying to do, because the plain fact of the matter is that all the swaps in the world cannot turn a risky asset into a genuine Treasury bill. What works in standard finance theory works only approximately in actual practice, and the devil is in the details of that approximation. The weird and wonderful world of derivatives at best creates what we might call quasi-Treasury bills, which may well trade nearly at par with genuine Treasury bills during ordinary times, only to gap wide during times of crisis. Here we identify the fundamental problem of liquidity, from which standard theory abstracts, as well as the reason that central bank backstop is needed. Promises to buy are no good unless you have the wherewithal to make good on them; the weak link in the modern system is the primitive character of our network of promises to buy.

Just so, consider the situation of a shadow bank that holds both a risky asset and various swaps that reference that risky asset, and then finances the lot in the wholesale money market, as in Figure 1. In principle the combination of assets and swaps is risk-free (i.e. a quasi-Treasury bill), but the practical question is whether the shadow bank can finance the combination in the same way that it could if it were actually risk free (i.e. a genuine Treasury bill). Suppose that the market value of the asset falls a bit. Even supposing that the value of the swaps rises pari passu—which it may not, given liquidity issues--there still remains the issue how to use that change in market value to meet the funding gap on the asset itself.

If the terms of the swap contracts are mark-to-market with speedy cash collateral transfer, then the swap value gain produces immediate cash inflow that might possibly be used to fill the funding gap. However, if the terms are otherwise so that the funding gap persists, then the underlying risky asset position may have to be liquidated, so exacerbating downward price pressure as a liquidity spiral gets

under way. And even if the swap terms are favorable there could still be a problem, since what is favorable to one party is unfavorable to its counterparty. Mark-to-market with speedy cash collateral transfer just means that the liquidity troubles of the shadow bank are shifted onto the shoulders of its swap counterparty which now faces its own funding gap. Even if the shadow bank is fine, its counterparty may be forced to liquidate and so spark its own downward liquidity spiral.

To stem these liquidity spirals, what is clearly needed is some entity that is willing and able to use its own balance sheet to provide the necessary funding. If the funding gap is at the shadow bank, we need an entity that can turn the increased value of swap positions into an actual cash flow. If the gap is at the swap counterparty, we need an entity that can turn whatever assets the counterparty might have into actual cash flow. Ultimately we need a central bank, but that is just the ultimate backstop. Well before this, what we need is a dealer system that offers market liquidity by offering to buy whatever the market is selling. Only in crisis time does the central bank backstop become the market; in normal times, the central bank backstop merely operates to support the market.

Thus, just as in Bagehot's day, the critical infrastructure is an interconnected system of dealers, backstopped by a central bank. Just as in Bagehot's day, the required backstop may involve commitment to outright purchase of some well-defined set of prime securities (such as Treasury securities). But it must also involve commitment to accept as collateral a significantly larger set of securities, in order indirectly to put a floor on their price in times of crisis. In previous work, we have called this commitment "dealer of last resort" rather than "lender of last resort" in order to draw attention to the modern importance of market liquidity, and hence the importance of placing bounds on price fluctuation (Grad, Mehrling, and Neilson 2011; Mehrling 2011).<sup>2</sup>

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<sup>2</sup> The contrast with "lender of last resort" is not meant to be a contrast with Bagehot himself, but rather a contrast with the distorted version of Bagehot that has come to dominate our thinking during the intervening century. Under the bank loan-based credit system, emphasis came to be placed entirely on the lending, i.e. funding liquidity, to the neglect of indirect price support of the underlying accepted collateral, i.e. market liquidity. That happened, so it seems, for two historically contingent reasons. First, most often the underlying accepted collateral

The key issue for financial stability, today as in Bagehot's day, is to find a way to ensure a lower bound on the price of prime bills. The difference is that today, unlike in Bagehot's day, prime bills are manufactured by stripping price risks of various sorts out of risky long term securities. The consequence is that today, unlike in Bagehot's day, a lower bound on the price of prime bills requires also some kind of liquidity backstop of the instruments that are used to create the prime bills from riskier raw material.

## **II. The Dealer Function, Boom and Bust**

Dealers supply market liquidity by quoting a two-sided market and absorbing the resulting order flow on their balance sheets (Harris 2003). One important kind of idealized dealer is a "matched-book" dealer whose long positions exactly match his short positions, so that the dealer is in principle completely hedged against price risk. This is the kind of idealized dealer we imagined in our basic model of the shadow banking system (Figure 1). But a dealer who insisted on matched book at every point in time would not, strictly speaking, be supplying market liquidity at all. If customers are able to buy or sell quickly, in volume, and without moving the price, it is because a dealer is willing to take the other side of that trade without taking the time to look for an offsetting customer trade. The consequence is inventories, sometimes long and sometimes short depending on the direction of the imbalance; and the consequence of inventories is exposure to price risk.

For Global Money Dealers, matched book means term funding of quasi-Tbills. Deviations from matched book involve overnight funding of quasi-Tbills (long inventory), or overnight investment of term funding (short inventory). For Derivative Dealers, matched book means offsetting swap positions, and deviations from matched book involve net risk exposures (long or short). In both cases, deviations from matched book involve exposure to risk, so profit-seeking dealers will insist on positive expected

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was a genuine Treasury security so price support seemed irrelevant. Second, when the underlying collateral was something other than a Treasury it was typically a collection of illiquid loans that had no real market price that could be supported. Given the rise of the shadow banking system, neither of these historically contingent reasons any longer applies.

profit as the price of bearing that risk. The way that dealers ensure positive expected profit is by shifting the prices they quote in line with the exposures they are bearing.

**Figure 3: The Dealer System (Boom)**

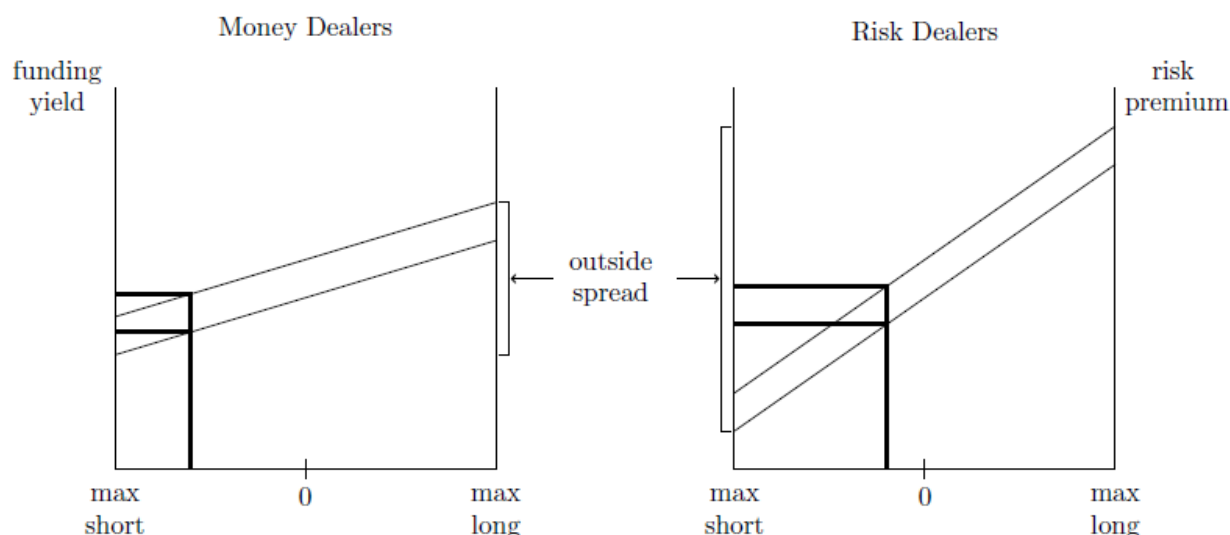


Figure 3 shows a stylized model, adapted from Treynor (1987), of how inventories affect price quotes in money and capital markets. In money markets, the longer the “inventory” (exposure to liquidity risk) the higher the yield; in risk markets, the longer the “inventory” (exposure to price risk) the higher the risk premium. In both cases, the slope of the quote curve depends on the amount of risk per unit of inventory, and also on the availability of the backstops (which Treynor calls value-based investors) which determine the outside spread. The different slopes in the money and capital markets reflect an assumption that the outside spread is much tighter in the former than in the latter. In both cases, observe that dealers move their price quotes to bring buy and sell order flows (quantities) closer into line with each other, and in doing so they move prices farther away from their “fundamental” matched-book reference point.

Because dealer inventory pressure determines prices, the economics of the dealer function interact intimately with the economics of shadow banking. The figure depicts both money dealers and risk dealers as holding net short positions, in effect using their balance sheets to absorb an excess order flow for money and for risk exposure, respectively. From a dealer perspective, asset managers are the ultimate buyers of money and risk exposure (see Figure 1), so the figure can be interpreted as the result of net order flow from asset managers. By absorbing the imbalance, dealers are pushed into short inventory positions, which causes them to quote lower money yields and lower risk premia.

The key point is that this price distortion makes shadow banking more profitable. Responding to the price incentive, shadow banks can be expected to spring up, so creating order flow on the other side of the market which allows dealers to run off their positions, until the next flow imbalance pushes up inventories again with consequent price distortions that stimulate further expansion. From this point of view, it is natural to trace the origins of the market-based credit system to two kinds of net order flow: increased demand for money balances, and increased demand for derivative risk exposure. Pozsar's work on institutional cash pools has emphasized the former (Pozsar 2011); here we emphasize equally the latter idea, which we treat as arising from techniques of modern portfolio management in which invested capital is all held in money form, and risk exposure is achieved using derivatives (Mehrling 2012). It is this order flow that created conditions favorable for the expansion of shadow banking.

In expansion mode, the inventory pressure on dealers is readily taken off by expansion of the private profit-seeking market-based credit system. But in contraction mode, the inventory pressure is all on the other side, and it is also harder to get rid of, as we shall see. From a dealer perspective, capital funding banks are the ultimate sellers of money and risk exposure, so when order flow from that direction is high, dealers are pushed into long inventory positions, which causes them to quote higher money yields and higher risk premia. For money market dealers, a shift to a long inventory position means funding term assets in overnight markets. Crucially, inventories of quasi-Tbills serve as collateral

for secured funding, but inevitably the price of those quasi-Tbills comes under pressure once there is no longer excess demand for money assets pushing price above fundamental value. And softening price inevitably raises doubts about fundamental value, even if there is no change in actual fundamentals. In such a circumstance, the central bank's willingness to lend against collateral, as also its willingness to buy the underlying, is key to preventing disorderly liquidation. To a generation raised on Jimmy Stewart banking, it looks like an illegitimate extension of lender of last resort from banks to dealers, but Bagehot would have recognized it as a fully legitimate support of the prime bill market.<sup>3</sup>

Less familiar to Bagehot would have been the capital market side of things. For risk dealers, contraction is a situation where everyone wants to sell risk exposure and no one wants to buy, even as the price of risky assets continues to fall. Dealers who dare to accommodate the resulting mismatched order flow find themselves saddled with risk exposure and mark-to-market losses that threaten insolvency. Meanwhile, the prospect of insolvency prevents other dealers from stepping in to buy. Without market-makers there can be no prices, and no prices means no secured borrowing, because there is no way to evaluate the security offered. Even quasi-Treasury bills cease to be quasi-Treasury bills since the operative pricing equation—price of “risk free” security = price of risky security + price of risk insurance—now has unknown values on the right hand side. In this way, the central bank's classic role in supporting the price of prime bills logically expands during crisis to include supporting the price of the raw material from which prime bills are manufactured.

Figure 4 shows the plight of the dealers during contraction as a matter of position limits that contract beyond realized inventories. If not for central bank support, dealers would be forced to liquidate for whatever price they can get, causing yields to spike and asset prices to plummet. If instead the central bank steps in as dealer of last resort, taking onto its own balance sheet the excess

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<sup>3</sup> The fact that some of the quasi-Tbills turned out to be less than prime inevitably cast doubt on all of them. Sloppy, or even fraudulent, underwriting during the boom thus exacerbated the downturn when it inevitably came.

inventories of the strained dealers, the consequence is to place bounds on the disequilibrium price movement. Contraction is not so much halted or reversed as it is contained and allowed to proceed in a more orderly fashion.

**Figure 4: The Dealer System (in Crisis)**

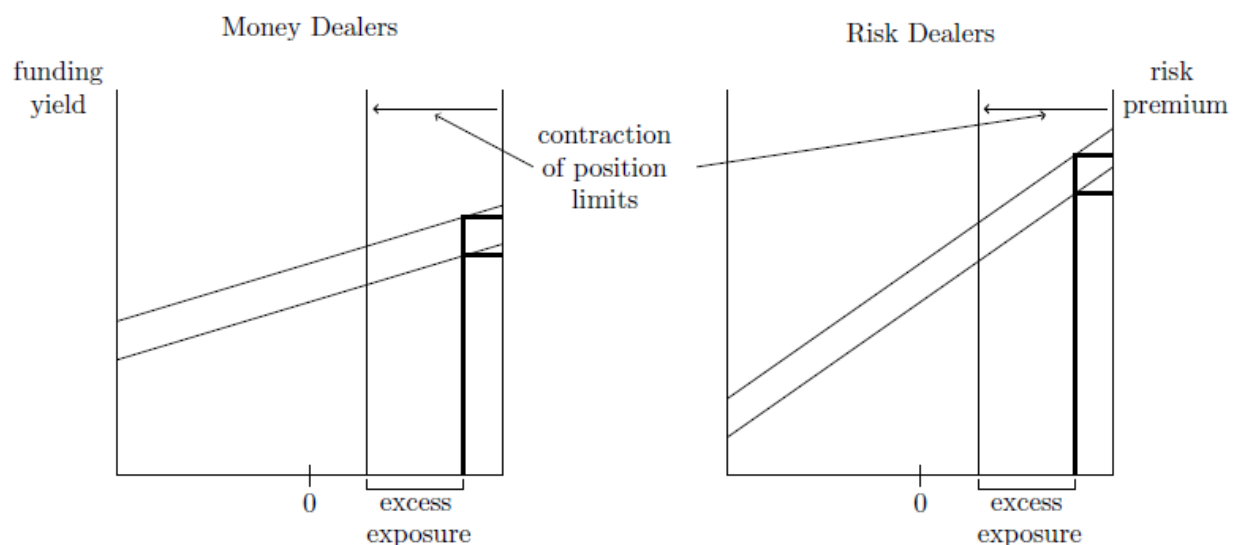


Figure 5 shows the balance sheet exposures for a central bank that acts in this way as dealer of last resort. The first line represents the excess inventory of the money dealers (term assets funded with overnight money). The second line represents the excess inventory of the derivative dealers. Comparison with Figure 1 reveals that the dealer of last resort is in effect filling the gap left by the slowing order flow from asset managers. The key difference however is that the asset manager demand was funded by private capital, whereas central bank demand is funded by reserve expansion.

The fact that the central bank can help in this way, by creating money rather than putting up any capital, reflects the maintained assumption of the present paper that the financial crisis is entirely a matter of liquidity and not at all a matter of solvency. Under this strong (and admittedly unrealistic) assumption, no additional capital resources are needed to address the crisis because there are no fundamental losses to be absorbed, only temporary price distortions to be capped. In any real world

crisis, of course, there are both liquidity and solvency elements at play, so liquidity backstop is insufficient. Just so, in the US crisis, there was the Treasury standing in the wings to provide capital as needed (e.g. TARP). In this paper we have abstracted from such matters in order to draw attention to the liquidity dimension, which remains largely unappreciated.

**Figure 5: Dealer of Last Resort**

Assets	Liabilities
Money	Reserves
	Swaps

### **III. The Inherent Instability of Credit**

The boom-bust expansion and contraction of shadow banking inevitably involves expansion and contraction of the supply of money. Here we find the link between shadow banking and macroeconomic instability. This link exists even though, by maintained assumption, the fluctuation in question does not involve any expansion or contraction of traditional bank deposits, but rather only various kinds of money substitutes. Money market mutual fund shares (invested in ABCP) or outright holding of RP are close substitutes for bank deposits because they can be spent on short notice; Treasury bills and quasi-Treasury bills are close substitutes because they can be used at short notice as collateral to obtain purchasing power. Either way, the growth of shadow banking can be understood as the elastic supply response to increased demand for money balances.

The “boom” character of the resulting expansion is simply the shadow banking version of Hawtrey’s famous “inherent instability of credit” (Hawtrey 1913), and it arises as a direct consequence of the market-making activities of dealers. Simply put, it is easy to make money by making markets



when you are standing in between powerful sources of ultimate flow supply and flow demand. As a consequence, during boom times the supply of market liquidity (i.e. dealer balance sheet capacity) is plentiful, and so the effective supply of money increases even more rapidly than the nominal supply of quasi-Treasury bills (Sweeney 2009). Not only quasi-Treasury bills but also the risky assets they finance became unusually liquid. The consequence is credit inflation, and a boom in the real economy as well.

Of course, even at the peak of the boom, government-issued Treasury bills and Fed-issued cash/reserve balances remain the ultimate form of collateral and the ultimate form of money respectively. But both become decreasingly important quantitatively given the growth of private capital markets and private money markets. Ultimate collateral and ultimate money remain crucial reference points, but the actual instruments are important only in times of crisis when promises to pay are cashed rather than offset with other promises to pay. Just so, during the recent global financial crisis, expansion of Fed reserves, Treasury debt, and contingent Treasury debt (deposit insurance) provided crucial levers to prevent the crisis from spiraling out of control.

Just as the “boom” character of expansion can be understood as a consequence of the dealer balance sheet expansion producing plentiful market liquidity, so too can the “bust” character of contraction be understood as a consequence of dealer balance sheet contraction producing scarce market liquidity. Simply put, it is hard to survive, much less actually to make money, by continuing to make markets when faced with powerful reversal, so the wisest course of action is simply to hold back. As a consequence, the supply of money substitutes that was sufficient to meet demand during the boom no longer proved sufficient once contraction began, simply because quasi-Treasury bills shed their moneylike aspect. Even without much actual contraction of the money supply broadly measured, and even with quite aggressive expansion of base money, the effective money supply plummeted, taking with it real economic activity.

#### IV. Conclusion

The rise of the market-based credit system can be seen as the rise of a (largely) private credit system alongside the existing (largely) public credit system, as well as the rise of a (largely) international credit system alongside the existing (largely) national credit system (Ricks 2011). Increasingly the dollar has become a private and international currency, and the international dollar money market has become the funding market for all credit needs, private and public, international and national. From this point of view, the rise of the market-based credit system is just part of the broader financial globalization that is such a prominent feature of the last thirty years.

But that new system has yet to show its ability to stand on its own, since it has grown up largely as a parasitical growth on the old system. Money market dealers were and still are typically divisions of traditional banks that enjoy traditional governmental backstops. And risk dealers were and still are typically funded by bank lending of one kind or another, in this way enjoying indirect access to traditional governmental backstops. The regulatory question now facing us is the apparent impossibility of extending these traditional public backstops to a system that is now increasingly private and international.

The way out, we suggest, is to shift our intellectual framework in a fundamental way, back to Bagehot in order to step forward to the 21<sup>st</sup> century. It is not the shadow bank that requires backstop, but rather the dealer system that makes the markets in which the shadow bank trades. Central banks have the power, and the responsibility, to support these markets both in times of crisis and in normal times. That support however must be confined strictly to matters of liquidity. Matters of solvency are for other balance sheets with the capital resources to handle them.

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