Bagehot was a Shadow Banker:

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

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The modern shadow banking system, at its core, bears a surprising resemblance to the 19th 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 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.

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 own balance sheets to stem the downturn. But they did so without any overarching theory of why it worked, much less any thought about implications for their role in more normal times. The time for all of that would come later, after the crisis had died down. 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 our own process of necessary rethinking, for our own time, by using Bagehot as an entry point into understanding the modern shadow banking system, and the global financial crisis of our own time.

I. What would Bagehot say?

Reading Bagehot, we enter a world where government securities are not yet the focal point of trading and prices, as they came to be in the 20th century. Instead, the focal point was the private bill market, which domestic manufacturers tapped as a source of working capital, and which traders worldwide tapped to finance the movement of tradable goods. It was a market in short-term private debt, typically collateralized by tradable goods, quite different from the 20th century market in long-term public debt, which is typically unsecured.

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 always take their prime bill assets to the Bank of England for rediscount, and get cash for them. Normally, though, they were able to get a somewhat higher price by tapping the lively secondary market in bills to find a private buyer. In normal times, the central bank backstop operated only to support the market; in crisis times, the central bank backstop became 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. The Bank also made loans of its own (“advances”) against collateral, and the Bank’s generous collateral valuations provided further support for market prices. Bagehot himself 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 was to prevent troubled banks from being forced to liquidate fundamentally sound assets at fire sale prices.

What would Bagehot make of modern shadow banking? On the surface, the modern system looks quite different. The closest we have to the institution of “acceptance” is the credit default swap, but that does not so much guarantee eventual par payment as current market value: price of “risk free” security = price of risky security + price of risk insurance (Mehrling 2010). Further, ours 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: price of short term security = price of long term security + price of interest rate swap. And finally, since the gold standard is long gone, in our world securities contain currency risk so we have the institution of the FX swap: price of 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 both worlds 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. Price of “risk-free” prime bills = price of risky security + price of risk insurance + price of interest rate swap + price of FX swap. When we look at shadow banking through the eyes of Bagehot, the crucial difference between his world and ours is not so much the weird and wonderful world of financial derivatives but rather the fact that Bagehot’s world was organized as a network of promises to pay in the event that someone else doesn’t pay (i.e. “acceptances”), whereas our own is organized as a network of promises to buy in the event that someone else doesn’t buy.

What accounts for the shift from his time to ours? The key reason is that in today’s world so many promised payments lie in the distant future, or in another currency. As a consequence, mere guarantee of par payment at maturity doesn’t do much good; in a liquidity crisis the problem everyone faces is how to get hold of cash dollars today. 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 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 guarantee 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.

But all the swaps in the world cannot turn a risky asset into a genuine Treasury bill (unless the government itself is the swap counterparty). 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 a fundamental problem of liquidity, as well as the reason that backstop is needed.

Just so, consider the situation of a shadow bank that holds both a risky asset and a credit default swap that references that risky asset, and finances the lot in the wholesale money market (details forthcoming in Section II). In principle the combination of assets is risk-free (a quasi-Treasury security),
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 (a genuine Treasury security). Concretely, suppose that the
market value of the asset falls a bit, with the consequence that the shadow bank cannot roll over its
funding in entirety and faces a funding gap. And suppose further that the value of the credit default
swap rises pari passu, so the issue at hand is how to use that change in CDS market value to meet the
funding gap on the asset itself.

If the terms of the CDS contract are mark-to-market with speedy cash collateral transfer, then the CDS
value gain turns into immediate cash inflow that might possibly be used to fill the funding gap.
However, if the terms are otherwise, so the funding gap cannot be filled, 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 terms of the CDS are favorable there could still be a problem, since what is
favorable to one party is possibly unfavorable to its counterparty. Market-to-market with speedy cash
collateral transfer just means that the liquidity troubles of the shadow bank are shifted onto the
shoulders of its CDS counterparty which now faces its own funding gap. Even if the shadow bank is fine,
its counterparty may be forced to liquidate something else and so spark a downward liquidity spiral on
its own.

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 CDS into an actual cash flow. If the gap is at the CDS
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. Even before this,
what we need is a dealer system that offers market liquidity by offering to buy whatever the market is
selling. In crisis times, the central bank backstop becomes the market; in normal times, the central bank
backstop operates to support the market.

Just as in Bagehot’s day, the critical infrastructure is an interconnected system of dealers, backstopp
ed 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 (Mehrling 2011).1 The

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1 The contrast with “lender of last resort” is not meant to be a contrast with Bagehot, but rather a contrast with
the distorted version of Bagehot that has come to dominate our thinking during the intervening century. In our
loan-based credit system, emphasis came to be placed on the lending itself, i.e. funding liquidity, rather than on
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 was a genuine Treasury
security so price support seemed irrelevant. Second, when the underlying collateral was something else it was
typically a collection of illiquid loans that had no real market price to support. The rise of the shadow banking
system has meant that neither of these historically contingent reasons any longer applies. We live today in a world
where the underlying collateral is typically a quasi-Treasury security, a world that is closer to the world Bagehot
key issue for financial stability, now as in Bagehot’s day, is 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.

II. What is Shadow Banking?

Like traditional “Jimmy Stewart” banking, the emerging collateral-based credit system (sometimes called “shadow banking”) involves credit intermediation that transforms both maturity and liquidity. In both systems, long term and illiquid assets are funded with short term and liquid liabilities. Notwithstanding this fundamental similarity, however, the difference between the two systems is profound, on at least three dimensions. Appreciation of these differences is the first step toward developing appropriate regulation and supervision.

First, the collateral-based credit system enjoys no direct public backstop, for either solvency or liquidity. Lacking both FDIC-style deposit insurance (solvency backstop) and access to the Fed’s discount window (liquidity backstop), the collateral-based credit system has instead (so far) relied on a variety of capital puts and liquidity puts to the traditional banking system. The existing public backstop of the traditional system has thus provided indirect (and largely unintentional) backstop of the newly emerging system (Pozsar et al 2010). One of the key issues on the table in current regulatory discussions is how best to bring this indirect backstop system out of the shadows, either to regularize it or to eliminate it. But these discussions are held back by inadequate understanding of the two other key differences between old and new.

Second, the collateral-based credit system involves money market funding of capital market borrowing. On the asset side and liability side both, we are talking about securities of various kinds—bonds not loans, commercial paper not deposits. And, crucially, we are talking about a system where specific capital market assets serve as collateral to secure specific money market funding; concretely, think of Asset-backed Commercial Paper and RP. By contrast, in traditional banking, deposits are unsecured liabilities backed by the entire balance sheet of the bank. This is a big, and a fundamental, difference.

Third, the collateral-based credit system involves market pricing, of both capital market assets and money market liabilities, which pricing is typically realized by the operations of specialized profit-seeking dealers. In the capital market, the various prices of risk are determined in derivative markets for specific kinds of risk—credit risk, interest rate risk, and FX risk. In each of these markets, dealers post buy and sell prices, and use their own balance sheets to absorb the resulting order flow. Similarly, in the money market, global banks operate as money dealers to determine the price of money, posting buy and sell prices and using their own balance sheets to absorb the resulting order flow. The economics of shadow banking revolve around the price of risk and the price of money that are established in these dealer markets (see Section IV).

was originally analyzing, and hence also a world where his original notion of central bank backstop is the relevant one.
Figure 1: Collateral-based Banking

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<tr>
<th>Assets</th>
<th>Liabilities</th>
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<tr>
<td>Risky Securities</td>
<td>Secured Money Market Funding</td>
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<td>Credit Enhancements</td>
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<td>--Credit Default Swaps</td>
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<td>--Interest Rate Swaps</td>
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<td>--FX Swaps</td>
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This way of thinking about shadow banking provides an entry point into the issues of solvency and liquidity that is quite different from one driven by erroneous analogy between Jimmy Stewart banking and shadow banking.

First, solvency. Typically secured money market funding involves a “haircut” on the value of the risky asset that is being offered as security, and this haircut creates a funding gap that needs to be filled by some other source. It is fundamentally because of the haircut that the shadow bank needs capital, and the bigger the haircut the more capital it needs, so emphasis is always on finding ways to make the haircut as small as possible. Various mechanisms of credit enhancement—think tranching and derivatives—have been developed to turn high-haircut assets into low-haircut assets, with the ultimate objective being to obtain maximal access to available money market funding. Not only credit risk but also interest rate risk was stripped out, leaving behind assets that required very little capital to support.

Unfortunately, habits of thought formed in the era of Jimmy Stewart banking have tended to interpret this practice of risk stripping to reduce necessary capital as a kind of “leverage”. But this is just a mistake. For a shadow bank, unlike a Jimmy Stewart bank, most of the capital supporting the assets it holds is not on its own balance sheet but rather on the balance sheets of its derivative counterparties. Indeed, if it were possible to strip out all risk in this way, shadow banks would need no capital at all, and their liabilities would in effect be a kind of asset-based currency! However, it is not possible to strip out all the risk, even in principle, which brings us to the Achilles heel of the whole system, liquidity risk.

Second, liquidity. Taken as a whole, the assets of the shadow bank may be as risk-free as credit enhancements can make them, but still there is no guarantee that their market valuation will exactly track the value of a truly risk-free security. And even if they did, there is no guarantee that the shadow bank will be able to use its assets to obtain needed funding when its current funding matures. In both cases, the shadow banking system relies on profit-seeking dealers, in both capital markets and money markets, as suppliers of liquidity. And the profit-seeking dealer system, in both capital markets and money markets, relies on the stability-seeking central banking system as backstop.

Unfortunately, habits of thought formed in an era when capital markets focused on government debt tend to miss the liquidity element. All standard theories of asset pricing abstract from liquidity, seeking instead to trace value to more “fundamental” factors. The maintained assumption is that deviations of market price from fundamental value are, at least in normal times, something aberrant (irrational).
and/or quickly corrected by (rational) profit-seeking arbitrage. Indeed, in the idealized world of efficient markets, prices are always exactly equal to their fundamental values. In this idealized world, the price of liquidity is zero, by assumption. In the real world, however, the price of liquidity is never zero, because liquidity is supplied by private profit-seeking dealers.

III. The Centrality of the Dealer Function

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 he is in principle completely hedged against price risk. (This is the kind of dealer that the Volcker Rule seems intended to establish.) If dealer assets fall in value then so do dealer liabilities. It follows that such an idealized dealer has no need to hold any capital. In the real world, of course, there is no such thing as a perfect hedge, and recognizing that imperfection means recognizing the need for dealers to hold capital, but how much? It depends on how close we are to the ideal, which is hard to measure.

More relevant to the present discussion, even an idealized matched-book dealer, who faces no price risk, still faces liquidity risk. Money market dealers, who are both long and short money market instruments, face liquidity risk even if their net exposure is zero, because it is gross exposure that matters; they must repay their creditors even if their own debtors do not repay them. The same goes for capital market dealers, who are both long and short risk derivatives of various types; they must top up collateral on their mark-to-market losing positions, even if they don’t receive collateral on their mark-to-market winning positions. It follows that even matched-book dealers will set prices to achieve positive expected profit as compensation for bearing liquidity risk. The price of liquidity is not zero, and cannot be zero, even for dealers who do no more than move funding and risk from one place to another, without ever taking a position of their own.

Even more, most dealers are not matched-book dealers but rather quite intentionally make a business out of absorbing, on their own balance sheets, any temporary imbalance between order flow on the buy and sell sides of the market. Indeed, a dealer who insisted on strict matched book at every point in time is not, strictly speaking, supplying market liquidity at all. If customers are able to buy or sell quickly, in volume, and without moving the price, it is because some dealer is willing to take the other side of that trade without taking the time to look for an ultimate offsetting customer trade. The consequence is inventories, sometimes long and sometimes short depending on the direction of the imbalance.

The important thing about inventories is that they need to be financed. An inventory of Treasury bills is easy to finance; an inventory of quasi-Tbills is harder but still feasible because the quasi-Tbills can be offered as collateral to obtain money market funding. This is the business of Global Money Dealers. For them, matched book means term funding of quasi-Tbills. Deviations from matched book might involve overnight funding of quasi-Tbills (long inventory), or overnight investment of term funding (short inventory).
An inventory of swap exposures is harder still to finance, and this is the business of Derivative Dealers. For them, matched book means offsetting swap positions. Deviations from matched book might involve risk exposures (long or short) hedged in offsetting futures with daily settlement. In this way, price risk is not so much eliminated as it is replaced by liquidity risk, and swap quotes therefore vary with swap inventories in order to compensate for the increased risk. If no futures market is available for hedging, or if the available futures only imperfectly hedge price risk, even more price movement will be required to compensate for the additional risk.

Figure 2 shows a stylized model, adapted from Treynor (1987), of how inventories affect price quotes in money and capital markets. In anticipation of what follows, the figure shows both money dealers and risk dealers as holding short positions, in effect using their own balance sheets to supply an excess flow demand both for money assets and for risk exposure. In money markets, where quotes are in terms of yield, the longer the inventory the higher the yield, and the shorter the inventory the lower the yield. In capital markets, where quotes are in terms of the price of the referenced risky asset, the longer the inventory the lower the price, and the shorter the inventory the higher the price. 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

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To avoid possible confusion, let it be noted that we adopt the convention of booking all swaps that strip out risk as assets on their ultimate owners balance sheet, and hence also as liabilities on the balance sheet of the counterparty to whom the risk is transferred. Thus, a swap liability expresses the same risk exposure as an outright holding of the referenced risky asset. The price of the swap and the price of the referenced risky asset move in opposite directions; to aid intuition for those unused to thinking about swaps, Figure 2 is drawn as if the dealer is operating in the risky asset itself, rather than the swap.
prices to bring buy and sell order flows (quantities) more into line with each other, but in doing so they move prices away from their “fundamental” matched-book reference point.

IV. Origins of Shadow Banking

Because dealer inventory pressure determines prices on the margin, the economics of the dealer function interact intimately with the economics of shadow banking. From a dealer perspective, shadow banks are demanders of money funding, and suppliers of risk exposure. If the dealer system were to absorb these order flows, without any offset on the other side, the consequence would be swelling inventories that cause dealers to shift prices in a direction that makes collateral-based banking less profitable (higher money yields and lower risk asset prices). Contrariwise, the incentive for expansion of collateral-based banking will be highest when dealers are swamped with supply of money funding and with demand for risk exposure, so that they tend to be accumulating inventories that push prices in the opposite direction (lower money yields and higher risk asset prices, as Figure 2), so making collateral-based banking profitable.

From this point of view, it is natural to trace the origins of collateral-based banking to two kinds of order flow: increased demand for money balances, and increased demand for derivative risk exposure. Pozsar’s work on corporate cash pools has emphasized the former (Pozsar 2011); Sweeney’s work on Portfolio Manager/Chief Investment Officer mandates has emphasized the latter (Sweeney 2012). Mehrling’s work in effect combines the two in a model of modern portfolio management in which invested capital is all held in money form, and risk exposure is achieved using derivatives (Mehrling 2012).

Figure 3 shows the demand for money and for risk exposure as a set of balance sheet entries that are the ultimate counterparts of the supply of money and risk exposure by the shadow banking system that was shown in Figure 1. Standing in between ultimate demand and supply are the dealers who make markets (Figure 2). Taken together, Figures 1-3 tell a story of how demand pushed around dealer inventories, so causing prices to move away from their matched book reference point. These disequilibrium price distortions, as we might call them, created incentives for someone to buy risky assets outright, strip out the risk with derivatives, and fund the resulting portfolio in the wholesale money market. Here is the origin of shadow banking. As shadow banking expanded, it created the supply that finally matched the background excess demand so allowing dealers to run off their inventories, until the next flow imbalance pushed them up again, with consequent price distortions that stimulated further expansion.

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<th>Figure 3: Rest Of World</th>
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<tr>
<td><strong>Assets</strong></td>
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It is important to emphasize here that increased demand for money balances is not at all necessarily increased demand for traditional bank deposits, which anyway are insured only for retail customers. Money market mutual fund shares (invested in ABCP) or outright holding of RP are close substitutes for many purposes, since they can be spent on short notice; Treasury bills and quasi-Treasury bills are close substitutes for other purposes, since they can be used at short notice as collateral to obtain purchasing power. Either way, growth of shadow banking can be understood as a way of increasing the supply of money and money substitutes in response to increased demand.

The “boom” character of the resulting credit expansion can be understood as a consequence of the intermediary 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 demand, and as a consequence market liquidity was plentiful. Insofar as the burgeoning demand for monetary assets was actually demand for the liquidity properties of those assets, the ample market liquidity meant that the effective supply of money increased even more rapidly than the nominal supply of quasi-Tbills emerging from the shadow banking system (Sweeney 2011). Why insist on holding genuine Tbills when quasi-Tbills promise the same liquidity but with a slightly higher yield? The consequence was credit inflation, and a boom in the real economy as well.

To be sure, government-issued Treasury bills and Fed-issued cash/reserve balances remained the ultimate collateral and ultimate money respectively. But both became decreasingly important quantitatively given the growth of private capital markets and private money markets during time of expansion. Ultimate collateral and ultimate money remain crucial reference points in modern financial markets, 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 reserves, Treasury debt, and contingent Treasury debt (deposit insurance) provided crucial levers to prevent the crisis from spiraling out of all control.

V. The New Lombard Street

In expansion mode, as we have seen, the inventory pressure on dealers is readily taken off by expansion of the private collateral-based credit system. But in contraction mode, the inventory pressure is all on the other side, and the key player is the central bank. Dealer of last resort, which seeks to put a floor on the price of risky assets and hence support collateral values, remains controversial. From a dealer perspective, the rise of the collateral-based credit system can be understood as a way of getting rid of excess inventories arising from increasing demand for money and risk exposure. The rise of dealer of last resort is just the mirror development, a way of getting rid of excess inventories on the other side of the market during a contraction.

For money market dealers, contraction brings a shift to a long inventory position, which means funding term assets in overnight markets. In the first instance, inventories of quasi-Tbills serve as collateral for
secured funding, but if contraction does not soon reverse inevitably the price of those quasi-Tbills comes under pressure since there is no longer excess demand for money assets working to push price above fundamental value. (Doubts about fundamental value inevitably follow softening price, even if there is no change in actual fundamentals.) In such a circumstance, the central bank’s willingness to lend against collateral is key to preventing disorderly liquidation, as also its willingness to buy the underlying. To a generation raised on Jimmy Stewart banking, it may look like an illegitimate extension of lender of last resort from banks to dealers, but Bagehot would have recognized all of this as a fully legitimate support of the prime bill market.3

Less familiar to Bagehot would have been the capital market side of things. For capital market 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. But 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 those 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 inventories of the strained dealers, the consequence is to place bounds on the disequilibrium price movement. Contraction is not so much halted or reversed but rather contained and allowed to proceed in a more orderly fashion.

3 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.
Figure 5 shows the balance sheet consequence 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.

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<td>Reserves</td>
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<td>Swaps</td>
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Comparison with Figure 3 reveals that the dealer of last resort is in effect filling the gap left by slowing demand for money and risk exposure in the private sector. The key difference however is that the private sector demand was funded by private capital, whereas central bank demand is funded by reserve expansion. This difference reflects the maintained assumption throughout the present paper that financial crisis is entirely a matter of liquidity and not at all a matter of solvency; 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, and intertwined. Just so, in the US crisis, there was the Treasury standing in the wings to provide capital as needed; we abstract from such matters in order to draw attention to the liquidity dimension, which remains largely unappreciated due to intellectual legacy.

Just as the “boom” character of expansion can be understood as a consequence of the dealer inventory pressure producing plentiful market liquidity, so too can the “bust” character of contraction be
understood as a consequence of the reverse inventory pressure producing scarce market liquidity. Simply put, it is hard to survive, much less 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 assets that was sufficient to meet demand during the boom no longer proved sufficient once contraction began, simply because quasi-Tbills shed their moneylike aspect. Even without much actual contraction of nominal money supply broadly measured, and even with aggressive expansion of base money, the effective money supply plummets, taking with it real economic activity.

VI. Conclusion

The rise of the collateral-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. Increasingly the dollar has become a private and international currency, and the international dollar money market is the funding market for all credit needs, private and public, international and national. From this point of view, the rise of the collateral-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, and has grown up to date largely as a parasitical growth on the old. Money market dealers were and still are typically divisions of traditional banks that enjoy traditional governmental backstops. And capital market dealers were and still are typically funded by bank lending of one kind or another, in this way enjoying indirect support by the same 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 21st century. It is not the shadow bank that requires backstop, but rather the dealer system that makes 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.
References


