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Why Is the U.S. Treasury Contemplating Becoming a Lender of Last Resort for Treasury Securities?

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Abstract

The U.S. Treasury announced in August 2005 that it is exploring whether to provide a backstop securities lending facility for U.S. Treasury securities. This paper examines the conceptual basis for such a facility by comparing the market for borrowing and lending Treasury securities to the market for borrowing and lending money prior to the founding of the Federal Reserve System. An inelastic supply of currency in the nineteenth century led to periodic suspensions of convertibility of bank deposits; Congress authorized a system of Federal Reserve Banks to address the problem. A similarly inelastic supply of Treasury securities has contributed to several recent episodes of chronic settlement fails. A backstop lending facility would mitigate the fails problem by allowing the Treasury to act as a lender of last resort of Treasury securities during periods of unusual market stress.

Key words: securities lending, repurchase agreements, Federal Reserve, Treasury securities, settlement fails

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1. Introduction

On Wednesday, August 3, 2005, the Assistant Secretary of the Treasury for Financial Markets announced that the Department of the Treasury was exploring the idea of a backstop securities lending facility.[1] In broad terms, the facility would make available to private market participants additional supplies of Treasury securities, over and above the amounts originally issued, on a temporary basis during periods of unusual market stress.

The idea of a backstop lending facility reflects a significant evolution in the role of Treasury securities in the American financial system. Until recently, it was a virtually universal understanding that the Treasury issued securities to finance the federal deficit and to refinance maturing debt. The securities might be short-term bills attractive to corporate treasurers or long-term bonds attractive to pension funds, but they were always a consequence of the government's need for cash. A backstop lending facility turns this understanding on its head: the Treasury would be issuing securities not because it needs cash, but because market participants need securities.

Treasury's interest in a backstop lending facility stems from several recent episodes of chronic settlement fails in Treasury securities, including after the attacks on 9/11 and in the second half of 2003.[2] A settlement fail is a securities transaction that does not settle as initially scheduled, i.e., the securities are not delivered by the seller (and, consequently, are not paid for by the buyer) on the date originally specified by the two parties. As explained below, *chronic* (or widespread and persistent) fails limit the ability of putative sellers to solicit bids from competing buyers and burden market participants with greater exposures to credit risk. Put simply, they increase the cost of trading Treasury securities. The prospect of further episodes of

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1 "August 2005 Quarterly Refunding Statement," Department of the Treasury, Office of Public Affairs, August 3, 2005 (available at www.treas.gov/offices/domestic-finance/debt-management/quarterly-refunding/08-03-2005/Policy-Statement.pdf.).

2 U.S. Department of the Treasury (2005, slide 14). Fleming and Garbade (2002) describe chronic settlement fails following the 9/11 attacks; Fleming and Garbade (2004) describe chronic fails in the second half of 2003.

chronic fails could lead some market participants to shift their trading activities to other venues, possibly degrading the liquidity of the Treasury market. It is widely recognized that market participants value liquidity and that investors are willing to pay higher prices for (or accept lower returns on) more liquid securities.[3] Further episodes of chronic fails risk increasing the costs of Treasury financings. To forestall this eventuality, the Treasury would become a "lender of last resort" of Treasury securities.

Forestalling chronic settlement fails by introducing a lender of last resort of Treasury securities is conceptually similar to forestalling systemic bank suspensions by introducing a lender of last resort of money. The origins of the lender of last resort of money in the United States are well-known. In the second half of the 19th century, credit was intermediated through a banking system based on gold and currency. An inelastic supply of currency, as well as limitations on the short-run elasticity of the supply of gold, exacerbated the liquidity strains that plagued the country from time to time and contributed to periodic suspensions of convertibility of bank deposits. Those suspensions were examples of "market failures." Even at high rates of interest, public demand to convert bank deposits to gold and currency exceeded the ability of the banks to honor their obligations. In 1913, Congress authorized a system of Federal Reserve Banks to act as lenders of last resort and to provide the country with a more elastic currency.

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[3] Amihud and Mendelson (1986, 1991), Sarig and Warga (1989), Silber (1991), Boudoukh and Whitelaw (1991, 1993), Warga (1992), Kamara (1994), and Elton and Green (1998).

Chronic settlement fails are a modern analog to nineteenth century bank suspensions.[4] When fails become chronic, securities lenders are unable to recover their securities for weeks or months, just as depositors were sometimes unable to convert their bank deposits to gold or currency in the 19th century. We suggest that chronic settlement fails are – like suspensions of convertibility of bank deposits – examples of market failure,[5] and we suggest that making securities available through a backstop lending facility is analogous to a central bank acting as a money lender of last resort.

To provide a framework for our analysis, we begin by describing (in section 2) banking before the advent of the Federal Reserve. Section 3 presents an overview of the role of Treasury securities in 21st century capital markets and section 4 describes how current practices in the Treasury securities market can lead to market failures analogous to bank suspensions in the 19th century. Section 5 discusses alternative approaches to forestalling chronic settlement fails.

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4 We do not suggest that recent episodes of chronic fails had anything like the impact of 19th century banking crises. However, they did lead to credit risks that were hardly trivial *ex ante*. The concurrent collapse of a major market participant with a large quantity of unsettled trades on its books could have triggered a chain of defensive actions and impaired liquidity in the Treasury market. Similar concerns prompted the Federal Reserve to take remedial action when Drysdale Government Securites, Inc. collapsed in May 1982. See Committee on Banking, Housing, and Urban Affairs (1982, pp. 26 and 36, testimony of Anthony Solomon, President, Federal Reserve Bank of New York, that "uncertainty about clearing and financing arrangements seemed to be building. There was concern that investors and traders would pull away from the markets because of uncertainty about the magnitude of the problem, and that major securities firms would be threatened with losses that could jeopardize their ability to function" and that "you could have had the beginning of a ripple effect; you might say the beginnings of the seizing up of the market …"). To facilitate settlements of transactions in Treasury securities, the Fed temporarily suspended limits on loans of Treasury securities from the System Open Market Account and announced that, contrary to previous policy, it would lend securities to finance short positions (Committee on Banking, Housing, and Urban Affairs, 1982, pp. 28 and 40-41). This led to a ten-fold increase in securities lending by the Fed (Committee on Banking, Finance, and Urban Affairs, 1983, p. 21).

5 Huther (2004) also characterized chronic settlement fails as market failures.

2. Banking in the Second Half of the 19th Century

Banking after the Civil War was based on gold coin ("specie"), Treasury currency, and national bank notes, which collectively constituted "base money." Treasury currency included gold and silver certificates (essentially warehouse receipts for bullion deposited with the Treasury) and United States notes (commonly called greenbacks).[6] National bank notes were issued by nationally chartered banks and were redeemable on demand – at the bank of issue or at the Treasury in Washington – in specie or Treasury currency. An issuing bank had to pledge Treasury bonds against its notes and had to maintain a balance with the Treasury to facilitate redemption.[7]

Depositors held bank deposits as well as specie and currency because deposits were less susceptible to theft and because it was usually cheaper to make payments at distant points by check. Most check payments nevertheless required the use of base money for final settlement. For example, suppose A made a payment to B by writing a check. If A and B were customers of different banks in the same city, the payment had to be settled with a transfer of base money from A's bank to B's bank. If the banks were in different cities, the payment was likely to be settled by a transfer of base money from the New York correspondent of A's bank to the New York correspondent of B's bank.[8]

With one important exception, bank loans were generally for fixed terms and could not be liquidated easily prior to maturity. (The exception was call loans on New York Stock Exchange securities. Call loans were highly liquid because they were one-day loans backed by high-quality collateral.) The mismatch (in both maturity and liquidity) between demand liabilities and term loans made banks relatively fragile institutions.

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6 Office of the Secretary of the Treasury (1960).

7 Friedman and Schwartz (1963, pp. 20-23) treat national bank notes *pari passu* with Treasury currency and include them in base money.

8 Canon (1910, chap. 6 and 7 and pp. 64-68).

The Money Market

One useful way to think about banking in the second half of the 19th century is to examine the demand for, and supply of, base money.

On the demand side, individuals and businesses held base money to make hand-to-hand payments. There was also a strong seasonal demand for specie and currency to pay field hands and to move the grain and cotton crops to market each fall.[9] In addition, most banks were required to hold a reserve of base money against their deposit liabilities, and typically held some excess above the required amount.

On the supply side, the stock of Treasury currency other than gold certificates was, as a practical matter, fixed over short intervals of weeks or months.[10] National banks were capable of varying the quantity of bank notes outstanding but chose not to do so over short intervals.[11] The domestic gold stock was more elastic, varying directly with domestic interest rates and inversely with foreign interest rates. The gold stock also varied as a function of the balance of payments. For example, a crop failure in Europe would trigger an expansion of U.S. agricultural exports, a rise in the value of the dollar against other currencies, and (once it became cheaper to ship gold to the U.S. than to buy dollars) an increase in the gold stock.[12]

Liquidity Strains

Liquidity strains appeared when depositors wanted to shift funds from bank deposits to base money in amounts comparable to or greater than what could be accommodated from bank reserves in excess of reserve requirements and whatever gold could be attracted from abroad.[13]

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9 Noyes (1910, p. 1) and Kemmerer (1910).

10 Office of the Secretary of the Treasury (1960) and Friedman and Schwartz (1963, p. 24).

11 Friedman and Schwartz (1963, p. 23), Noyes (1910, p. 9), and Kemmerer (1910, pp. 152-153).

12 Friedman and Schwartz (1963, pp. 98, 107, and 140-141).

13 Call loans provided liquidity when an individual bank had to meet adverse clearings with other banks, because the loans could be shifted to, or refinanced at, banks with more

Liquidity strains typically appeared when the banking system was in a seasonally fragile state (due to demand for base money to move the crops) and were triggered by, for example, bank failures (sometimes due to management fraud and sometimes due to loan losses) and gold exports (stemming from an adverse balance of payments). Liquidity strains were commonly accelerated and amplified by precautionary deposit withdrawals by individuals and businesses fearful of prospective bank suspensions.

Nineteenth century bankers understood the fundamental reason for liquidity strains: no more than a small fraction of depositors could convert a significant portion of their deposits to base money at the same time.[14] Efforts aimed at preventing and mitigating liquidity strains thus focused on schemes to "liquefy" the banking system in times of financial stress. There were two basic schemes: private production of substitutes for base money, and action by the Treasury to supply additional base money. The first approach led to the development of clearing house loan certificates [15] – a predecessor of Federal Reserve discount window loans. The second approach

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favorable clearings. Call loans provided much less liquidity to the banking system as a whole when depositors in aggregate wanted to hold a materially larger fraction of their money balances in the form of base money. Sprague (1910, pp. 24 and 84-85).

[14] Baxter and Sommer (2000) provide an interesting view of this problem in a contemporary context.

[15] A clearing house loan certificate was an interest-bearing claim for the future payment of base money issued under the auspices of a clearing house association. Upon deposit of acceptable collateral and approval of a clearing house committee, a member bank could draw certificates in an amount equal to 75 percent of the value of the collateral and use the certificates to settle claims on itself. Later, after market stresses had subsided, the bank would redeem the certificates and reclaim its collateral by paying current holders the face amount of the certificates plus accrued interest in base money.

Clearing house loan certificates were first issued in the fall of 1860 by the New York Clearing House Association to alleviate financial stresses engendered by the onset of the Civil War. Loan certificate programs were renewed by the New York clearing house, and adopted by clearing houses in other cities, during subsequent liquidity strains in 1873, 1884, 1890, 1893, and 1907. Cannon (1910, chap. 10 and 11). Certificates were initially limited to settling clearing house balances and were not negotiable except between clearing house members. Beginning in 1893, clearing house associations outside of New York began to authorize member banks to pay out to their depositors small-denomination certificates as

led initially to a forerunner of open market operations and subsequently to an early version of the Treasury Tax and Loan system.[16]

Unusually severe liquidity strains in 1873, 1893, and 1907 led banks to suspend convertibility of their deposits. Suspension disrupted settlements between banks in the same city and crippled settlements between banks in different cities. Disruption of the payments system led in turn to a contraction in trade, inventory back-ups, and, ultimately, a broad decline in aggregate economic activity.[17]

The 1907 suspension demonstrated to the satisfaction of most observers that something more than clearing house loan certificates and *ad hoc* Treasury actions was needed to forestall further strains. The Aldrich-Vreeland Act, passed by Congress in 1908, provided for the National Monetary Commission that helped lay the foundation for the Federal Reserve System.[18]

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substitutes for base money in hand-to-hand transactions. Cannon (1910, pp. 76 and 109-112).

16 Prior to the early 1890s the Treasury added base money to the economy by buying or redeeming outstanding Treasury bonds, paying for its purchases with specie and currency that had accumulated (during periods of budget surpluses) in its vaults in Washington and at subtreasurys around the country. Sprague (1910, pp. 26, 40-42, 135-139, and 149-151) and Kinley (1910, p. 237). After 1887 the Treasury began to make direct deposits in Treasury accounts at national banks. Kinley (1910, pp. 119-146, 187, 256-257, and 278-281). Garbade, Partlan, and Santoro (2004) describe the modern Treasury Tax and Loan system.

17 Sprague (1910, pp. 38-40, 71-74, 200, 202-203, and 206).

18 Meltzer (2003) describes the origins of the Federal Reserve System. Less well known, the Aldrich-Vreeland Act also created a mechanism to enhance the elasticity of national bank note circulation. Specifically, the Act provided for the formation of "national currency associations" by groups of ten or more national banks. Upon pledge of commercial loans and approval of the Secretary of the Treasury, a bank that was a member of a national currency association could issue bank notes equal to 75 percent of the value of the pledged loans. Later, after market stresses had subsided, the bank could redeem the notes and reclaim its collateral by depositing specie or Treasury currency with the Treasury. Emergency bank notes were issued only once, following the initiation of hostilities at the beginning of World War I. Silber (forthcoming) describes the single resort to the emergency currency provisions of the Aldrich-Vreeland Act. See also Sprague (1914, 1915). Friedman and Schwartz (1963, p. 172) opined that "The availability of the emergency issue probably prevented … restriction of payments by the banking system" in 1914.

3. The Role of Treasury Securities in 21st Century Capital Markets

The keys to appreciating why the Treasury might want to become a lender of last resort of Treasury securities are (1) understanding the central role of Treasury securities in managing interest rate risk and (2) understanding how the use of Treasury securities in risk management has fostered the development of, and is dependent on, a market for borrowing and lending those securities.

A variety of market participants actively manage their exposure to fluctuations in interest rates by *hedging*, selling liquid instruments *short* against relatively static (and less liquid) long positions when they want to reduce risk. Market participants hedge positions in intermediate- and long-term fixed income securities with on-the-run Treasury securities,[19] Treasury futures contracts, and interest rate swaps.

Treasury securities are important to managing interest rate risk for four reasons:

- On-the-run Treasury securities are used directly for hedging less liquid securities.
- Treasury securities serve as the ultimate reference point for pricing Treasury futures contracts.
- On-the-run Treasury securities are used by swap dealers as short-term swap hedges, and thus contribute to the efficiency of the swaps markets.[20]
- Market participants undertake spread trades against Treasury securities when they think a particular sector is mispriced; buying a security in a relatively cheap sector against selling a Treasury security short, or vice versa. Spread trades are important to

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[19] An on-the-run security is the more recently auctioned security in its series, e.g., the most recently auctioned 10-year note.

[20] For example, suppose a swap dealer agrees with a counterparty to receive fixed payments for ten years against making floating rate payments. If the dealer is unable to identify promptly another customer with a compatible trading interest, it may hedge its risk by selling 10-year Treasury notes short. The dealer will liquidate the hedge when it identifies an opportunity to offset its risk directly in the swaps market.

keeping relative prices and yield spreads more stable than they might otherwise be, thereby reducing basis risk and facilitating hedging.

All of these uses involve short sales of Treasury securities that the seller does not own and has to borrow to make delivery to the buyer. The ability to borrow Treasury securities is thus vital for both hedgers and spread traders and plays a central role in modern interest rate risk management.

There are today (and have been for several decades) well-developed markets for borrowing and lending Treasury securities.[21] Borrowers pay lenders a fee for the use of their securities – either directly, or indirectly by accepting a rate of interest on money lent on special collateral reverse repurchase agreements below the rate on general collateral repos. (Repurchase agreements are described in the appendix.) An investor that lends securities accepts a claim on the borrower for the return of the securities, just as a 19th century depositor accepted a claim on a bank in exchange for base money. Demand and supply for borrowed securities come into equilibrium through changes in borrowing fees. A higher fee makes financing a short position more costly, reducing demand to borrow the security. It also makes lending the security more rewarding, bringing out additional supply.

4. Strains in the Markets for Borrowing and Lending Treasury Securities

We observed earlier that 19th century bank liquidity strains appeared when depositors wanted to shift from bank deposits to base money in amounts comparable to or greater than what could be accommodated with excess bank reserves and gold attracted from abroad. A similar situation can occur in the markets for borrowing and lending Treasury securities.

Suppose, for example, there is $20 billion of a ten-year Treasury note outstanding and that, initially, holders of 75 percent of the note are willing to lend the note. Ignoring settlement

[21] An early reference to markets for borrowing and lending Treasury securities appears in Lucas, Jones, and Thurston (1977, p. 44).

frictions, the outstanding notes can support a short base of up to $60 billion.[22] Suppose the actual short base is $40 billion. If the fraction of investors willing to lend the note subsequently contracts to 60 percent, there would be no way to satisfy the demands of all of the lenders who want their securities returned, because the $20 billion of outstanding notes can then support a short base of only $30 billion.[23]

The foregoing analysis ignores the market-clearing role of the note's borrowing fee. It would certainly be reasonable to suppose that the borrowing fee would rise in response to the contraction in loan supply until there was a comparable contraction in borrowing demand. However, in some cases demand to borrow securities can not be rationed down by a higher borrowing fee because the borrowing fee can not usually exceed the interest rate on general collateral repurchase agreements.

The Upper Limit on Borrowing Fees

The upper limit on borrowing fees for Treasury securities arises as a by-product of a market convention on a seemingly unrelated topic: routine settlement fails. Fails occur every business day because of miscommunication, clerical error, and – most commonly – failure to receive in securities (from unrelated purchases) needed for redelivery. No special stigma attaches to a fail (because fails usually occur for such innocuous reasons) and Treasury market participants have adopted the contracting convention that a failing seller can make delivery after

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[22] If a fraction f of investors are willing to lend an issue of size Q, then the issue can support a short base of $S = f \times (S + Q)$, or $S = [\, f / (1 - f) \,] \times Q$. S = $60 billion when f = 0.75 and Q = $20 billion. In words, if $60 billion of the note is held short, then there must be $80 billion of the note held long: the $60 billion from the short sellers, plus the $20 billion amount outstanding. If 75 percent of the longs are willing to lend, then $60 billion is available for lending. This just balances what the shorts need to borrow.

[23] Using the notation of the previous footnote, S = $30 billion when f = 0.60 and Q = $20 billion.

the originally scheduled settlement date at the original invoice price and without any explicit penalty.[24]

Despite the absence of an explicit penalty on settlement fails, sellers are not indifferent about delivering securities. A fail can impose significant *implicit* costs on a seller because it leaves the seller short of funds. If a seller fails to deliver $100 million of securities, it will end the day with $100 million less cash. It either has to borrow an additional $100 million (thereby incurring additional out-of-pocket interest expenses) or it has $100 million less to lend (thereby suffering the opportunity cost of a reduction in interest earnings). If the interest rate on overnight general collateral repurchase agreements (the "GC" rate) is 4 percent, a seller will incur $11,111 in additional expenses – or foregone earnings – by failing for a single day ($\$11{,}111 = .04 \times (1/360) \times \$100{,}000{,}000$).[25]

The implicit cost of a fail – the time value of money reflected in the GC rate – means that a seller has an economic incentive to borrow securities to avoid failing as long as the borrowing fee is less than the GC rate. Conversely, failing will be less costly than delivering borrowed securities if the borrowing fee exceeds the GC rate. Thus, short sellers will not usually pay more than the GC rate to borrow securities.[26]

Chronic Settlement Fails

If the GC rate is low, the fee for borrowing a security may not be able to rise high enough to reduce demand sufficiently, or to stimulate enough supply, to clear the securities lending

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[24] See, for example, Public Securities Association (1993, chap. 8, sect. C): "If securities are not delivered on the agreed upon settlement date, there is a fail. Regardless of the date the securities were actually delivered, the buyer of the securities pays the seller the original settlement date figures."

[25] Conversely, a settlement fail works to the advantage of a buyer who doesn't have to pay for securities that it expected to receive, because the buyer either has additional funds to invest or has to borrow less from creditors.

[26] However, as noted by Fleming and Garbade (2004), borrowing fees can exceed the GC rate if there are ancillary costs to failing.

market before the borrowing fee hits the GC rate, whereupon the unsatisfied demand spills over into settlement fails. The resulting fails are a consequence of a *market condition*: a demand to borrow in excess of the supply available at a borrowing fee equal to the GC rate. Fails can become widespread and will persist as long as the underlying market condition persists.

The Federal Reserve Bank of New York has collected data on primary dealer fails since mid 1990.[27] Figure 1 shows two instances of chronic fails between 1991 and the end of 2003: following the attacks of September 11, 2001, and during the second half of 2003. The former episode began with operational problems caused by the attacks, but persisted and deepened because of a contraction in the supply of securities available for lending following the initial surge in fails.[28] Settlement fails began to subside only after the Treasury unexpectedly added to the outstanding supply of the on-the-run 10-year note by reopening that note in a surprise auction offering.

Figure 2 shows that the second episode of chronic settlement fails came when the Federal funds rate – a close proxy for the GC rate – was 1 percent. At the end of June 2003, market participants anticipated that interest rates would be rising in the near future and they sold short an unusually large quantity of Treasury securities to hedge long positions in other securities. The demand to borrow created by the short sales pushed the cost of borrowing several issues to the (low) GC rate and the excess demand spilled over into fails. The volume of fails remained elevated through the summer and fall of 2003 and began to decline only when a variety of ancillary costs – including increased capital charges and back-office expenses – became intolerable.[29]

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[27] See *Guide to FR2004 Settlement Fails Data*, available at www.newyorkfed.org/markets/pridealers_failsprimer.html. Fleming and Garbade (2005) use the New York Fed data to examine the behavior of fails since 1991.

[28] Fleming and Garbade (2002) describe the circumstances of the post-9/11 settlement fails.

[29] Fleming and Garbade (2004) describe the circumstances of the chronic fails in the second half of 2003.

The 2001 and 2003 episodes were cases of market failure: demand (to borrow securities) exceeded supply but borrowing fees could not rise high enough to clear the excess demand. We suggest that those episodes were analogous to 19th century bank suspensions. Market participants who borrowed or sold securities were temporarily unable to deliver the securities, just as banks in 1873, 1893, and 1907 were temporarily unable to make good on their deposit liabilities.

The chronic fails in 2001 and 2003 had two important consequences. First, the parties to some of the unsettled transactions were exposed to credit risk. A buyer faced the risk that the price of a security would rise and the seller fail, forcing the buyer to replace the securities at a higher price. A seller faced the risk that the price of a security would fall and the buyer fail, forcing the seller to liquidate the securities at a lower price. The cost of monitoring and managing this credit risk was an unexpected addition to the cost of trading Treasury securities.

The second consequence was that buyers who failed to receive securities they had purchased, and lenders who failed to receive securities back when their loans matured, became *involuntary* lenders. Involuntary lenders who wanted to sell but who did not want to fail themselves (perhaps to avoid adding to their credit exposures) could not solicit bids from competing dealers because they did not have securities to deliver. They were forced to bargain with their failing counterparties on a bi-lateral basis and settle for cash differences.

The experiences of some market participants in 2001 and 2003 could lead them to withdraw as voluntary lenders of Treasury securities if, in the future, they begin to question whether securities will be returned as promised. Widespread withdrawals would accelerate and amplify liquidity strains in the markets for borrowing securities, just as precautionary withdrawals of bank deposits accelerated and amplified liquidity strains in 19th century money markets.

5. Forestalling Chronic Settlement Fails

Treasury officials have recognized that the liquidity of the Treasury securities market could suffer if further episodes of chronic settlement fails and the attendant consequences (inability of buyers to obtain the securities they purchased, inability of lenders to recover their securities, and the costs of managing additional credit risk exposures) lead market participants to shift their trading activities to other venues.[30] Impaired liquidity could, in turn, lead to lower valuations for Treasury securities and higher financing costs for the Treasury.[31] It follows that forestalling chronic fails directly serves the Treasury's debt management goal of meeting the financing needs of the federal government at the lowest cost over time. [32]

The most direct approach to forestalling chronic settlement fails would be to alter the contracting convention that a failing seller can make delivery after the originally scheduled settlement date at the original invoice price. For example, market participants might agree that the invoice price on a transaction will be reduced at the rate of, say, 5 percent per annum for each day that settlement is delayed beyond five business days.[33] This would increase the cost of failing from the GC rate to the GC rate plus 5 percent and would raise the ceiling on security borrowing fees to the GC rate plus 5 percent. Allowing the borrowing fee to rise above the GC rate would reduce demand and make lending more rewarding, thereby reducing – and perhaps eliminating – the spill-over of excess demand into settlement fails.

However, any such change in the contracting convention for settlement fails would have to overcome a significant collective action problem. It would clearly be impractical to have

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30 U.S. Department of the Treasury (2005, slide 14).

31 U.S. Department of the Treasury (2005, slide 14).

32 Under Secretary of the Treasury Peter Fisher identified the goal of Treasury debt management as meeting the financing needs of the federal government at the lowest cost over time in a speech on March 14, 2002, available at <http://www.treas.gov/press/releases/po1098htm>.

33 The five day grace period would avoid penalizing routine fails attributable to miscommunication and clerical error that are usually quickly resolved.

some buyers and sellers reducing invoice prices on aged fails while other buyers and sellers were continuing to follow the present convention, so essentially every large market participant, including dealers, hedge funds, and large institutional investors, would have to agree to change at the same time. Consensus may be hard to come by because the change is likely to require extensive and costly reprogramming of back office computer systems. [34]

Introducing a backstop securities lending facility and having the Treasury act as a lender of last resort would avoid the collective action problem of changing the contracting convention for settlement fails. Instead of removing the existing impediment to a market clearing price, a lending facility would provide for a temporary expansion in supply when demand to borrow exceeded supply at a borrowing fee equal to the GC rate.

The simplest version of a lending facility would have the Treasury lend securities on demand at a borrowing fee equal to the GC rate. This would give sellers an opportunity to cure their settlement fails by borrowing securities from the Treasury at a fee equal to the implicit cost of their fails. Requests to borrow from the Treasury for reasons other than to resolve chronic fails would be unlikely, because private market borrowing fees are less than the GC rate when fails are not chronic, i.e., a borrowing fee equal to the GC rate would price the Treasury out of the market except when fails were chronic. The Treasury would require collateral to limit its exposure to credit risk, so the facility would replace the unsecured credit exposures presented associated with chronic fails with secured borrowings.

6. Summary

This paper suggested that the markets for borrowing and lending Treasury securities in the 21st century are broadly analogous to the 19th century market for borrowing and lending

[34] Nevertheless, a precipitative event has sometimes focused the attention of market participants on an inefficient contracting convention and stimulated a consensual, albeit costly, change in the convention. The leading example is the recognition of accrued interest on repo securities following the collapse of Drysdale Government Securities in May 1982. See Garbade (forthcoming).

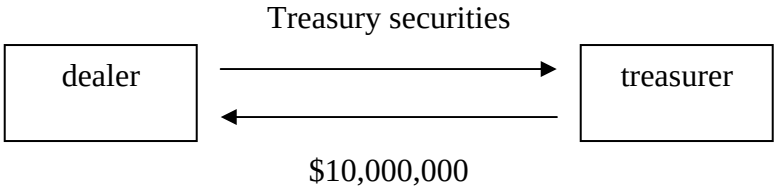
money. Dealers and other market participants today have short-term liabilities denominated in Treasury notes; 19th century banks had deposit liabilities. Additionally, there is limited elasticity in the supply of individual Treasury securities today, just as there was limited elasticity in the supply of base money in the 19th century.[35] A backstop securities lending facility would enhance the elasticity of supply of Treasury securities in the same way that the Federal Reserve Banks enhanced the elasticity of currency a century ago. It would mitigate chronic settlement fails, just as the Federal Reserve System mitigated suspensions of convertibility of bank deposits.

[35] The Federal Reserve's securities lending program makes Treasury securities available at a borrowing fee in excess of a stipulated threshold to facilitate settlements and thereby provides some elasticity in the supply of those securities. See Fleming and Garbade (2002, 2004). However, the Federal Reserve can not lend more securities than it owns. In some cases it owns a negligible amount. For example, the Fed owned only $252 million of the ten-year note maturing in May, 2013 that was in demand in the summer of 2003.

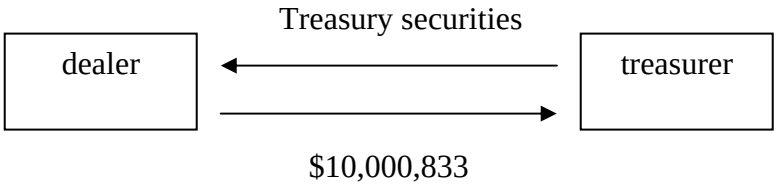
Appendix. Repurchase Agreements

A repurchase agreement (repo or RP) is a sale of securities coupled with an agreement to repurchase the securities at a later date. A repo is similar to a collateralized loan. As shown below, a securities dealer might borrow $10 million overnight from a corporate treasurer at an effective interest rate of 3 percent per annum by selling Treasury securities valued at $10 million and simultaneously agreeing to repurchase the securities the following day for $10,000,833 ($833 = (1/360) × 3% of $10,000,000). The lender of funds (the treasurer in the example) is said to enter into a *reverse* repurchase agreement.

Starting leg of dealer's repurchase agreement and treasurer's reverse repurchase agreement:

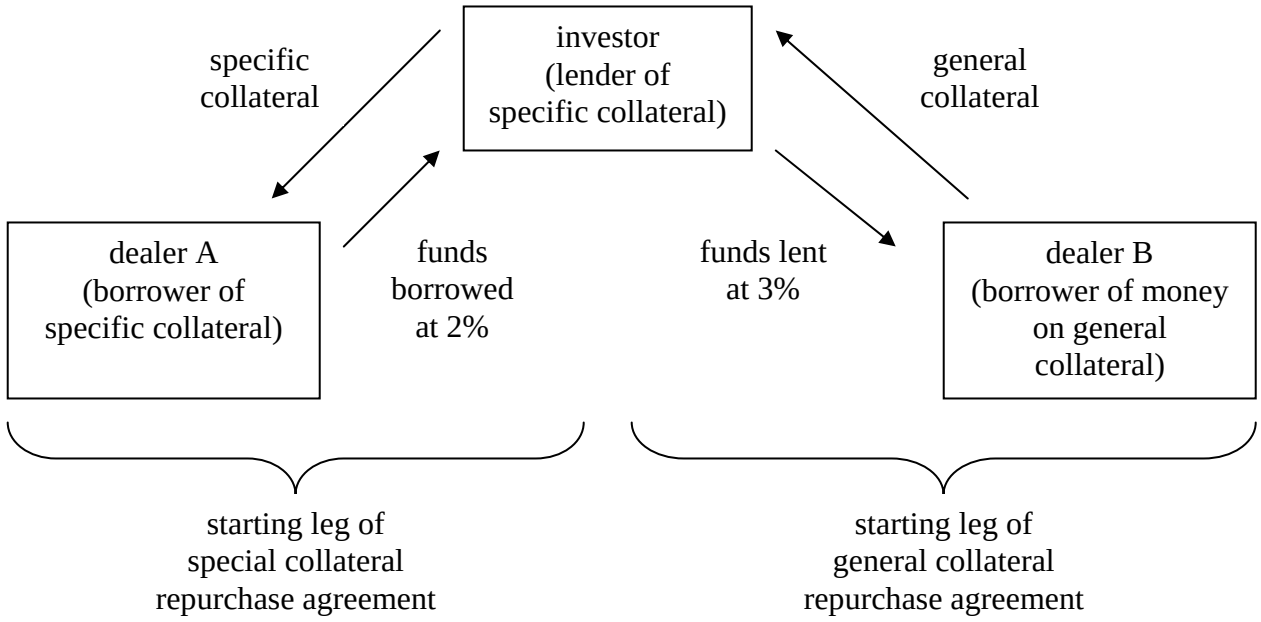


Closing leg (one day later):



Repurchase agreements come in two flavors: general collateral agreements and special collateral agreements. A *general collateral* repo is an RP in which the lender of funds is willing to accept any of a variety of securities as collateral. The lender is concerned primarily with earning interest on its money and having possession of assets that can be sold quickly in the event of a default by the borrower. Interest rates on general collateral RPs are usually quite close to rates on overnight loans in the federal funds market. This reflects the essential character of a general collateral RP as a device for borrowing and lending money.

A *special collateral* RP is a repo in which the lender of funds designates a *particular* security as the *only* acceptable collateral.[36] Dealers and others lend money on special collateral repos in order to borrow specific securities. The interest rate on a special collateral RP is commonly called a "specials" rate. The owner of a Treasury security that a dealer wants to borrow may not have any particular interest in borrowing money, but can nevertheless be induced to lend the security if it is offered an opportunity to borrow money at a specials rate less than the general collateral rate. For example, if the rate on a special collateral RP is 2 percent and the general collateral rate is 3 percent, then – as shown below – an investor can earn a 100 basis point spread by borrowing money on the special collateral RP and relending the money on a general collateral RP.



[36] Special collateral repos are detailed by Duffie (1996), Keane (1996), Jordan and Jordan (1997), Fisher (2002), and Fleming and Garbade (2004). Lucas, Jones, and Thurston (1977, p. 44) noted the existence of special collateral repo markets in 1977. Market participants borrowed bonds on reverse repurchase agreements as early as the late 1950s. U.S. Treasury and Federal Reserve System (1959, p. 38).

The difference between the general collateral RP rate and the specials rate for a particular security is a measure of the "specialness" of the security. If the demand to borrow the security is modest relative to the supply available for lending, a dealer borrowing the security will usually be able to lend its money at a rate no lower than about 15 to 25 basis points below the general collateral rate. If the demand to borrow is strong, or if the supply is limited, the specials rate for the security may be materially below the general collateral rate and the specialness spread correspondingly large.[37]

The specialness of a security – the difference between the interest rate on money lent against general collateral and the interest rate on money lent against the specific security – is the economic cost of borrowing the security.

[37] Instances of extremely low specials rates are documented by Cornell and Shapiro (1989), Jordan and Jordan (1997, pp. 2058-2059), and Fleming (2000, pp. 229-231).

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Figure 1. Average Daily Settlement Fails

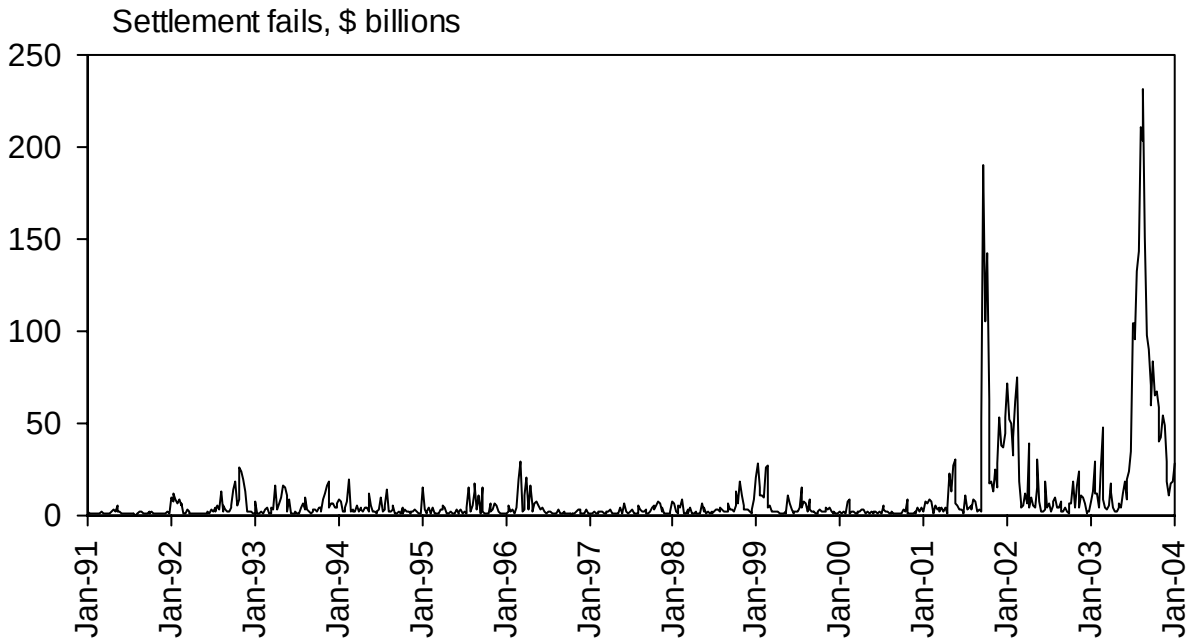

Figure 2. Overnight Federal Funds Rate