

Kenneth D. Garbade, Frank M. Keane, Lorie Logan, Amanda Stokes,
and Jennifer Wolgemuth

THE INTRODUCTION OF THE TMPG FAILS CHARGE FOR U.S. TREASURY SECURITIES

- Prior to May 2009, market convention enabled a seller of Treasury securities to postpone—without any explicit penalty and at an unchanged invoice price—its obligation to deliver the securities.
- The September 2008 insolvency of Lehman Brothers exposed a flaw in this convention, when a decline in short-term interest rates set the stage for an extraordinary volume of settlement fails that threatened to erode the perception of the market as being free of credit risk.
- In response, the Treasury Market Practices Group introduced a “dynamic fails charge” for Treasury securities in May 2009.
- The fails charge incentivizes timely settlement by providing that a buyer of Treasury securities can claim monetary compensation from a seller if the seller fails to deliver on a timely basis.
- The fails charge mitigated a key dysfunctionality in the market and illustrates the value of public and private sector cooperation in responding to altered market conditions.

1. INTRODUCTION

Securities transactions commonly involve a variety of market conventions—widely accepted ways of doing business that persist through time even though not mandated by law or regulation. Commonplace examples include the quotation of prices for Treasury bonds in increments of 32nds (and fractions of a 32nd) of a percent of principal value (rather than in decimal increments) and the quotation of Treasury bills in terms of discount rates (rather than prices or yields).

In most cases, market conventions are useful or, at worst, innocuous. In some cases, however, a new use for an old instrument can render a convention in need of revision. One particularly notorious example was the convention—observed prior to 1982—of ignoring accrued interest on Treasury bonds sold on repurchase agreements (also known as repos, or RPs). The convention made sense as long as repos were used primarily to borrow money from creditworthy lenders that held the bonds simply to limit their exposure to credit risk. It made less sense when highly leveraged securities dealers began to use repos to borrow bonds to deliver on short sales. The 1982 Drysdale episode illuminated the risks involved in ignoring accrued interest and prompted the Federal Reserve Bank of New York to orchestrate a change in the convention.¹

¹ Garbade (2006).

Kenneth D. Garbade is a senior vice president, Frank M. Keane an assistant vice president, Lorie Logan a vice president, Amanda Stokes a trader/analyst, and Jennifer Wolgemuth a counsel and assistant vice president at the Federal Reserve Bank of New York.

Correspondence: kenneth.garbade@ny.frb.org

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A market convention may also require revision following a change in the economic environment. This article discusses a recent example: the convention of postponing—without any explicit penalty and at an unchanged invoice price—a seller’s obligation to deliver Treasury securities if the seller fails to deliver the securities on a scheduled settlement date. As discussed in more detail below, as long as short-term interest rates were above about 3 percent, the time value of money usually sufficed to incentivize timely settlement of transactions in Treasury securities. However, when short-term rates fell to

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near zero following the insolvency of Lehman Brothers Holdings Inc. in September 2008, the time value of money no longer provided adequate incentive and the Treasury market experienced an extraordinary volume of settlement fails. Both the breadth of the fails across a large number of securities and the persistence of the fails were unprecedented and threatened to erode the perception of the Treasury market as a market free of credit risk.² In response, the Treasury Market Practices Group (TMPG)—a group of market professionals committed to supporting the integrity and efficiency of the U.S. Treasury market—worked over a period of six months to revise the market convention for settlement fails, developing a “dynamic fails charge” that, when short-term interest rates are *below* 3 percent, produces an economic incentive to settle trades roughly equivalent to the incentive that exists when rates are *at* 3 percent. Thus, the TMPG fails charge preserves a significant economic incentive for timely settlement even when interest rates are close to zero.

² See, for example, Wrightson, *Federal Reserve Data*, October 17, 2008 (“The breakdown in the clearing mechanism for the Treasury market is beginning to emerge as a top-tier policy concern. The safe-haven status of Treasury securities is one of the few advantages the government market has left in a year in which net Treasury borrowing needs . . . are likely to exceed \$1 trillion by a large margin. At some point, though, buyers will think twice about buying a ‘safe-haven’ asset for peace of mind if they have doubts about their counterparty’s ability to deliver the security.”).

This article describes the introduction of the TMPG fails charge. The introduction of the fails charge is important for two reasons. First, it mitigated an important dysfunctionality in a market of critical significance both to the Federal Reserve in its execution of monetary policy and to the country as a whole. Second, it exemplified the value of cooperation between the public and private sectors in responding to altered market conditions in a flexible, timely, and innovative fashion.

Our study is divided into three parts. The first part (Sections 2-5) describes settlement processes and settlement fails in the Treasury market, explains why sellers usually try to avoid fails, describes industry and Federal Reserve efforts to mitigate settlement fails prior to 2008, and briefly reviews three episodes of chronic fails in the Treasury market. The second part (Section 6) describes the tsunami of fails that followed Lehman’s insolvency. The balance of the study (Sections 7-10) explains the TMPG’s response. Section 11 concludes.

2. SETTLEMENTS AND SETTLEMENT FAILS IN U.S. TREASURY SECURITIES

A transaction in Treasury securities is said to “settle” when the seller delivers the securities to, and receives payment from, the buyer. The two most important settlement processes are bilateral settlement and multilateral net settlement. Before describing those processes, we explain how market participants establish and transfer ownership of Treasury securities.

2.1 Establishing and Transferring Ownership of Treasury Securities

For more than three decades, investors have established ownership of Treasury securities through Federal Reserve book-entry securities accounts.³ Book-entry account holders that own Treasury securities can house their securities directly in their accounts and can transfer the securities to other book-entry accounts by issuing appropriate instructions to the Federal Reserve.

Federal Reserve book-entry accounts are generally available only to depository institutions and certain other organizations, such as government-sponsored enterprises and foreign central banks. All other market participants establish ownership of Treasury securities through *commercial* book-entry accounts at depository institutions that act as custodians for their customers. Depository institutions that offer commercial

³ See “Book-Entry Securities Account Maintenance and Transfer Services,” Federal Reserve Banks Operating Circular no. 7, August 19, 2005. Garbade (2004) describes the origins of the Federal Reserve book-entry system.

book-entry accounts hold their customers' securities in their Federal Reserve book-entry accounts commingled with their own securities.

A market participant with a commercial book-entry account can transfer Treasury securities to another market participant through their respective custodians. For example, participant A can transfer a Treasury security to participant B by instructing its custodian to debit its commercial book-entry account and to transfer the security to B's custodian for credit to B's commercial book-entry account. Upon receipt of instructions, A's custodian will debit A's account and instruct the Federal Reserve to 1) debit its Federal Reserve book-entry account and 2) credit the Federal Reserve book-entry account of B's custodian. Following receipt of the security in its Federal Reserve book-entry account, B's custodian will complete the transfer by crediting B's commercial book-entry account. (If A and B have a common custodian, the transfer can be completed on the books of that common custodian without involving the Federal Reserve.)

2.2 Bilateral Settlement

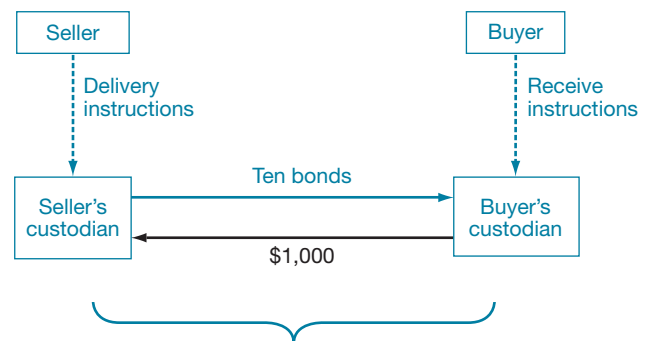
The simplest type of settlement occurs when a market participant has sold Treasury securities for bilateral settlement on a deliver-versus-payment basis. The sale may be a conventional sale of securities but it may alternatively be

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the starting leg, or the "off" leg, of a repurchase agreement. (We describe repurchase agreements in more detail below.)

Suppose, for example, an investor sells ten Treasury bonds at a price of \$100 per bond for settlement on June 2. Following negotiation of the terms of the sale, the seller will instruct its custodian to send ten bonds to the buyer's custodian on June 2 against payment of \$1,000. The buyer will concurrently instruct its custodian to receive, on June 2, ten bonds from the seller's custodian and to pay \$1,000 upon receipt of the bonds. On June 2, the seller's custodian will instruct the Federal Reserve to 1) debit its Federal Reserve book-entry account for ten bonds, 2) credit the Federal Reserve book-entry account of the buyer's custodian for ten bonds and *simultaneously* debit the account of the buyer's custodian for the \$1,000 due upon

EXHIBIT 1
Bilateral Settlement



Note: This transfer of bonds and funds is effected through the Federal Reserve if the seller and buyer have different custodians, and is effected on the books of the common custodian if they have the same custodian.

delivery, and 3) credit the seller's custodian's account for the \$1,000. The resulting transfers of securities and funds are shown in Exhibit 1.⁴

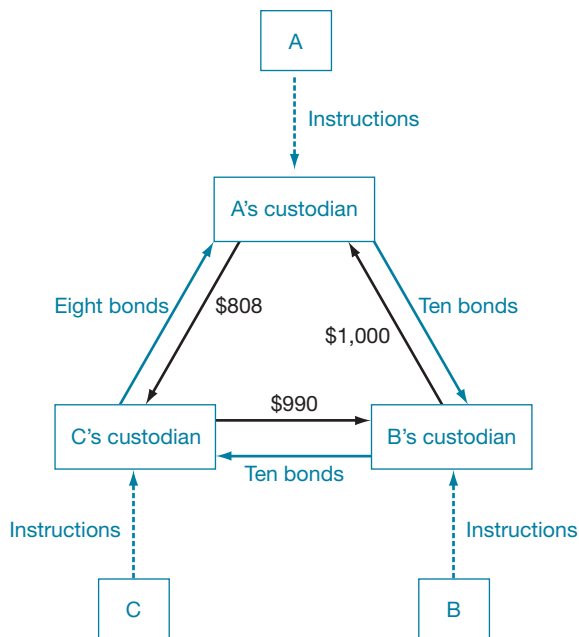
Following notification that ten bonds have come into its Federal Reserve book-entry account and that \$1,000 has been withdrawn, the buyer's custodian will verify that the bonds and money are consistent with the buyer's instructions. In most cases, they are and the custodian will credit the buyer's account for the ten bonds and debit that account for \$1,000. In some cases, however, the buyer will have provided different instructions—perhaps referencing a different security or a different invoice price—or no instructions. In any of these cases, the buyer's custodian will reverse the settlement, instructing the Federal Reserve to return the ten bonds and recover the \$1,000 payment. The buyer and seller and their respective custodians will then have to communicate and come to a common understanding of the terms of the underlying transaction, following which the seller will reinitiate the settlement process.

2.3 Multilateral Net Settlement

Bilateral settlement is a simple process that satisfies the purpose of settlement: moving securities from sellers to buyers and moving funds from buyers to sellers. Alternative settlement structures, however, can sometimes be more efficient.

⁴ In the event the buyer and seller have a common custodian, settlement can be completed on the books of the common custodian, with cash and securities moving between the accounts of the respective customers, without involving the Federal Reserve.

Bilateral Settlement of Three Transactions



Consider, for example, the case where:

- participant A sells ten bonds to participant B at a price of \$100 per bond for settlement on the following business day,
- B sells ten of the *same* bonds to participant C at a price of \$99 per bond, also for settlement on the following business day, and
- C sells eight of the *same* bonds to A at a price of \$101 per bond, again for settlement on the following business day.

As shown in Exhibit 2, bilateral settlement of the three transactions requires the delivery of twenty-eight bonds against payments of \$2,798.

As an alternative, the participants might agree to settle through a central counterparty (CCP). The CCP first marks all of the deliver and receive obligations to a common price—say, \$100 per bond. After marking to the common price,

- A is obligated to deliver ten bonds to B against payment of \$1,000,
- B is obligated to deliver ten bonds to C against payment of \$1,000, and
- C is obligated to deliver eight bonds to A against payment of \$800.

Marking to a common price results in gains for some participants and losses for others. In the example, B gains

because it will receive more for the bonds sold to C than the original contract price and C loses for the same reason. These gains and losses are exactly offset with further agreements to make small side payments of cash. In particular:

- A agrees to pay \$8 to the CCP, reflecting the \$8 gain from marking the price of the eight bonds bought from C down from \$101 per bond to \$100 per bond,
- B agrees to pay \$10 to the CCP, reflecting the \$10 gain from marking the price of the ten bonds sold to C up from \$99 to \$100 per bond, and
- the CCP agrees to pay \$18 to C, in compensation for the \$8 loss from marking the price of the eight bonds sold to A down from \$101 per bond, and for the \$10 loss from marking the price of the ten bonds bought from B up from \$99 per bond.

On the night before the settlement date, the CCP nets out the deliver and receive obligations of A, B, and C and novates⁵ their respective contracts, becoming the buyer from every *net* seller and the seller to every *net* buyer, all at the common settlement price. After netting and novation:

- A is obligated to deliver two bonds to the CCP against payment of \$200,
- B has no deliver or receive obligations, and
- the CCP is obligated to deliver two bonds to C against payment of \$200.

On settlement day, the obligations of A to deliver two bonds to the CCP and the CCP to deliver two bonds to C are settled with bilateral deliver-versus-payment settlements. In addition, A, B, and the CCP make the agreed-upon side payments of cash. Exhibit 3 shows that multilateral net settlement requires the delivery of four bonds and payments of \$436—about 15 percent of the deliveries and payments shown in Exhibit 2.

2.4 Some Concrete Identities

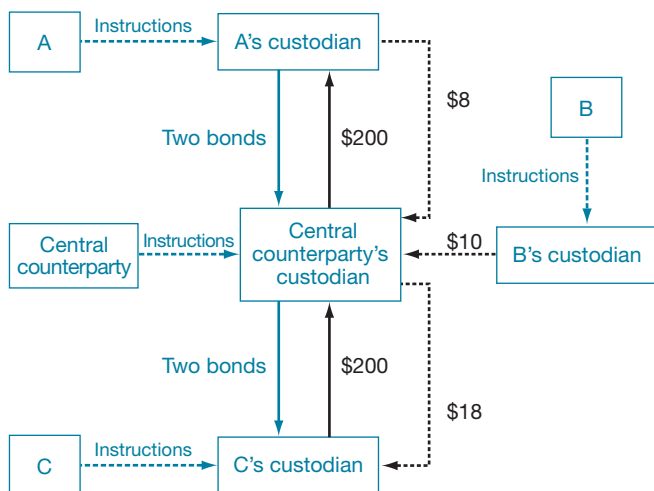
The foregoing description of settlement processes referred to abstract entities like “participant A” and an unnamed “central counterparty.” Before we begin to discuss settlement fails, it may be helpful to identify some of the key participants in the Treasury market.

At the center of the market is a group of dealers that provide liquidity to customers, quoting bid prices at which they are willing to buy and offer prices at which they are prepared to sell. A subset of dealers, called “primary dealers,” make markets

⁵ To novate is to substitute one legal obligation for another.

EXHIBIT 3

Multilateral Net Settlement of Three Transactions



Note: Security settlements are shown with solid blue and black lines. Side payments, represented by dashed black lines, take place independently of security settlements.

to the Federal Reserve Bank of New York when the Bank is conducting open market operations on behalf of the Federal Reserve System.⁶ Box 1 identifies the primary dealers as of mid-2008.

Dealers sometimes trade directly with each other, but more commonly through specialized interdealer brokers. A dealer that sells securities to another dealer through an interdealer broker agrees to deliver securities (against payment) to the broker. The broker, in turn, agrees to deliver the same securities (also against payment) to the ultimate buyer. This arrangement allows the dealers to trade on a “blind,” or undisclosed, basis.

All of the dealers, and all of the interdealer brokers, maintain commercial book-entry accounts at one of two banks: JPMorgan Chase Bank, N.A., and The Bank of New York Mellon. These two “clearing” banks offer custodial services refined over many years to meet the needs of brokers and dealers that deliver and receive large volumes of securities on a daily basis.

The Fixed Income Clearing Corporation (FICC), a subsidiary of the Depository Trust & Clearing Corporation, is the central counterparty in the Treasury market. All of the

⁶ See, generally, Federal Reserve Bank of New York, “Administration of Relationships with Primary Dealers,” January 11, 2010, available at http://www.newyorkfed.org/markets/pridealers_policies.html.

Box 1

Primary Dealers in Mid-2008^a

- Banc of America Securities LLC
- Barclays Capital Inc.
- Bear, Stearns & Co., Inc.^b
- BNP Paribas Securities Corp.
- Cantor, Fitzgerald & Co.

- Citigroup Global Markets, Inc.
- Credit Suisse Securities (USA) LLC
- Daiwa Securities America Inc.
- Deutsche Bank Securities Inc.
- Dresdner Kleinwort Securities LLC

- Goldman, Sachs & Co.
- Greenwich Capital Markets, Inc.
- HSBC Securities (USA) Inc.
- J. P. Morgan Securities Inc.
- Lehman Brothers Inc.^c

- Merrill Lynch Government Securities Inc.^d
- Mizuho Securities USA Inc.
- Morgan Stanley & Co. Incorporated
- UBS Securities LLC

^a Federal Reserve Bank of New York, “Primary Dealers List,” July 15, 2008, available at <http://www.newyorkfed.org/newsevents/news/markets/2008/an080715.html>.

^b Removed October 1, 2008, following its acquisition by J. P. Morgan Securities Inc.

^c Removed September 22, 2008.

^d Removed February 11, 2009, following its acquisition by Bank of America Corporation.

primary dealers and all of the interdealer brokers, as well as a number of other market participants, are netting members of FICC. FICC maintains commercial book-entry accounts at both JPMorgan Chase and The Bank of New York Mellon and is prepared to receive securities from, and deliver securities to, any of its netting members in a timely and efficient fashion.

Beyond the dealers, the interdealer brokers, and FICC, the Treasury market consists of a large number of other participants, including “real-money” investors such as mutual funds, pension funds, and corporate treasurers, and “leveraged accounts” such as hedge funds. Some of these participants trade directly with dealers, others trade anonymously in electronic markets. All use custodians that offer more or less complex (and more or less costly) services tailored to their needs.

2.5 Settlement Fails

A settlement fail occurs when the obligation of a seller to deliver securities to a buyer remains outstanding following the close of business on the scheduled settlement date of a transaction. This can occur either because the seller's custodian failed to tender any securities to the buyer's custodian, or because the buyer's custodian rejected whatever securities were tendered by the seller's custodian. In the event of a settlement fail in Treasury securities, the market convention is to postpone settlement to the following business day without any

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change in the funds due upon delivery and (prior to May 2009) without any explicit penalty or charge.⁷ The process of failing (to settle) and deferring settlement to the next business day can take place repeatedly, day after day, until settlement occurs or the trade is canceled.

Settlement fails can occur for any of several reasons. First, a fail can result from miscommunication. A buyer and seller may not have a common understanding of the terms of a trade, or one or the other may have failed to communicate settlement instructions to its custodian, or may have communicated incorrect instructions, or one of the custodians may have misunderstood the instructions that it received. In any of these cases, the buyer's custodian will reject whatever securities are tendered by the seller's custodian. After becoming aware of the failed attempt to settle (or of the absence of any attempt to settle), the buyer and seller and their respective custodians communicate to resolve the problem. This usually results in successful settlement within a day or two.

A fail may also stem from operational problems. One well-known instance occurred on Thursday, November 21, 1985, when a computer outage at The Bank of New York

⁷ This convention was memorialized in Chapter 8, Section C, of the *Government Securities Manual* of the Public Securities Association: "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." The Public Securities Association was the forerunner of the Bond Market Association, which joined with the Securities Industry Association in 2006 to form the Securities Industry and Financial Markets Association.

(a predecessor of The Bank of New York Mellon) prevented that bank from effecting deliveries of Treasury securities. The bank was unable to resolve the problem until the following day, and had to finance overnight (at its own expense) the customer securities that it was unable to deliver. It borrowed in excess of \$20 billion from the Federal Reserve Bank of New York and incurred interest expenses of \$5 million.⁸

A settlement fail can also occur because the seller does not have the requisite securities in its commercial book-entry account. This is the most common reason for failing when fails are chronic, but it is usually avoided at other times by borrowing securities and delivering the borrowed securities.

3. REPURCHASE AGREEMENTS AND BORROWING SECURITIES TO AVOID OR CURE SETTLEMENT FAILS

A repurchase agreement is a sale of securities coupled with an agreement to repurchase the same securities at a specified price on a later date.⁹ Market participants use repos to borrow money when they buy securities but do not have sufficient cash on hand to pay for them, that is, to finance long positions, as well as to borrow securities when they sell securities they do not already own, that is, to finance short positions.

A repo is analogous to a loan, where the proceeds of the initial sale correspond to the principal amount of the loan and the excess of the repurchase price over the original sale price corresponds to the interest paid on the loan. A market participant might, for example, sell securities for \$10 million and simultaneously agree to repurchase the securities ten days later for \$10,008,333. This is analogous to borrowing \$10 million for ten days at an interest rate of 3 percent per annum.¹⁰ Market participants commonly think of repos as loans, rather than as purchases and sales, and quote repos in terms of interest rates rather than in terms of sale and repurchase prices.¹¹

⁸ A Computer Snafu Snarls the Handling of Treasury Issues," *Wall Street Journal*, November 25, 1985, p. 58; Committee on Banking, Finance, and Urban Affairs (1985); "Fed is Queried on Failure of Bank Computer System," *Wall Street Journal*, December 13, 1985, p. 49; "Fed Weighs a Penalty," *New York Times*, December 13, 1985, p. D2; Sender (1986).

⁹ Repurchase agreements are complex financial instruments whose contracting conventions have evolved over the past four decades. See Garbade (2006) and Fleming and Garbade (2003, 2004).

¹⁰ $\$8,333 = (\text{repo term of 10 days} / 360 \text{ days in a year}) \times 3 \text{ percent per annum} \times \10 million , where the calculation uses the money market convention of a 360-day year.

¹¹ The quotation convention does not change the nature of a repo—a transaction in which one party sells securities subject to an agreement to repurchase them at a later date.

Repos are most commonly arranged on an overnight basis but can run for days or weeks. They can also be arranged on an “open,” or continuing, basis (with a daily adjustment of the interest rate) at the mutual consent of the parties. Industry standard documentation for a repo provides that if the original seller fails to repurchase the securities on the agreed-upon repurchase date, the original buyer has the contractual right to, among other things, sell the securities to a third party and use the proceeds to satisfy the original seller’s repurchase obligation. Conversely, if the original buyer does not deliver the securities back to the original seller on the repurchase date, the original seller has the contractual right to, among other things, use the funds that it otherwise would have used to repurchase the securities to “buy in,” or replace, the securities.

3.1 Types of Repurchase Agreements

Repos come in two flavors: *general collateral* repos (used to borrow money) and *special collateral* repos (used to borrow securities).

General collateral repos: A general collateral repo is a repo in which the lender of funds is willing to accept any member of a stated class of securities as collateral. Any of a variety of securities is acceptable because the lender is concerned

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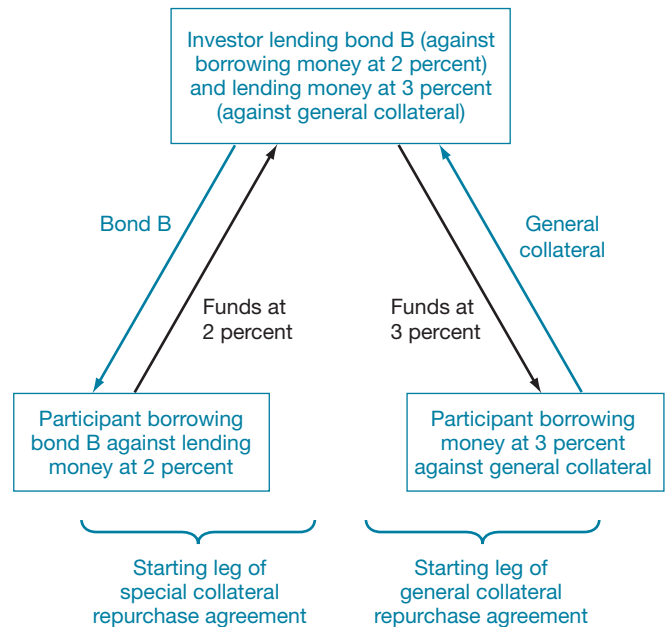
primarily with earning interest on its money and having possession of liquid assets that can be sold quickly in the event of a default by the borrower.

Interest rates on overnight general collateral repos are usually quite close to rates on overnight loans in the federal funds market. This reflects the essential character of a general collateral repo as a device for borrowing and lending money. Repo rates for the most liquid and creditworthy collateral, Treasury securities, are lowest. Repo rates for other classes of collateral, such as fixed-income securities issued by a federal agency or mortgage-backed securities issued by a government sponsored enterprise, are somewhat higher.

Special collateral repos: A special collateral repo is a repo in which the lender of funds designates a *particular* security as the *only* acceptable collateral.¹² Treasury market participants

EXHIBIT 4

Lending Treasury Bond B (against Borrowing Money at 2 Percent) on a Special Collateral Repurchase Agreement and Relending the Money on a General Collateral Repurchase Agreement at 3 Percent



Note: For simplicity, the separate roles of custodians are not shown explicitly.

commonly lend money on special collateral repos in order to borrow specific securities that they need.

The interest rate on a special collateral repo is called a “special rate.” The owner of a Treasury security that other market participants want to borrow may be incentivized to lend the security if that owner is offered an opportunity to borrow money at a special rate less than the Treasury general collateral repo rate. For example, if the rate on a special collateral repo involving bond B is 2 percent and the general collateral repo rate is 3 percent, an investor who owns bond B can earn a 100 basis point spread by lending the bond and borrowing money on a special collateral repo and then relending the money on a general collateral repo (Exhibit 4).

The difference between the general collateral repo rate for Treasury securities and the special collateral repo rate for a particular Treasury security is a measure of the “specialness” of the security and is commonly called the security’s “specialness spread.” We show below that a security’s specialness spread is exactly the opportunity cost of borrowing the security to avoid or cure a settlement fail.

¹² See Duffie (1996), Keane (1996), Jordan and Jordan (1997), Fisher (2002), and Fleming and Garbade (2002).

3.2 Incentives, prior to May 2009, to Borrow Securities to Avoid or Cure a Settlement Fail

Prior to May 2009, sellers of Treasury securities, including short sellers, borrowed securities to avoid or cure settlement fails primarily because they did not get paid until they delivered the securities that they had sold. Prior to May 2009, market participants usually quantified the cost to a seller of a settlement fail in Treasury securities as the overnight Treasury general collateral repo rate—the rate the seller could have

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earned on a riskless overnight investment of the sale proceeds that it did not receive. (It should be noted, however, that even prior to May 2009, the cost of a settlement fail was not limited to foregone interest earnings. Settlement fails also expose market participants to the risk of counterparty insolvency and can lead to increased capital charges for some participants. These other costs are discussed in Box 2.)

A seller who does not have the securities needed to settle a sale can avoid failing by borrowing (on a special collateral repo) the securities that it needs. However, borrowing securities is not costless because the borrower has to lend money (on the special collateral repo) at a rate lower than the general collateral repo rate that it could have earned on the money. The cost of borrowing securities to avoid a fail in Treasury securities may be quantified as the difference between the overnight Treasury general collateral repo rate (the rate the borrower could have earned on its money) and the overnight special collateral repo rate on the borrowed securities (the rate the borrower actually earns on its money)—that is, the securities' specialness spread.

Prior to May 2009, a seller had an incentive to avoid failing to deliver a security (by borrowing the security on a special collateral repo and delivering the borrowed security) as long as the cost of borrowing the security was less than the cost of failing. This was certainly the case if the specialness spread for the security was less than the general collateral repo rate or, equivalently, if the special collateral repo rate for the security

Box 2

Other Costs of Settlement Fails

Settlement fails impose risks on both buyers and sellers and can lead to increased capital charges for some market participants.

A buyer who fails to receive securities faces the risk that the seller might become insolvent before the transaction is settled and that, to replace the securities, it will have to pay more than the price negotiated with the insolvent seller. Conversely, a seller who fails to deliver securities faces the risk that the buyer might become insolvent before the transaction is settled and that the seller will then have to sell its securities to someone else at a price lower than the price negotiated with the insolvent buyer. These risks may be small for fails that are no more than a day or two old (because securities prices usually do not change much from day to day), but they can become significant when fails persist for weeks or months.

In view of the greater risks faced by both buyers and sellers during the life of a long-outstanding, or “aged,” fail, some market participants are required to absorb incremental capital charges when a settlement fail has been outstanding for more than a few weeks.^a Such capital charges can drain capital from more rewarding activities and limit balance sheet capacity, thereby imposing opportunity costs on market participants—and if sufficiently widespread and chronic can threaten overall market functioning.^b

^a See, for example, the net capital rule of the Securities and Exchange Commission, Code of Federal Regulations, Chapter 17, Section 15c3-1.

^b See, for example, “Minutes of the Meeting of the Treasury Borrowing Advisory Committee of the Bond Market Association, November 4, 2003,” November 5, 2003, available at <http://www.ustreas.gov/press/releases/js933.htm> (“While the situation is much improved since this past summer, members commented that fails were still at an elevated level which does hurt general market liquidity because dealers are forced to reduce their market making activities as the fails take up space on their balance sheets.”). One Treasury official suggested that opportunity costs resulting from higher capital charges might not be all bad. See “Remarks by Jeff Huther, Director of the Office of Debt Management, to the Bond Market Association’s Annual Meeting,” April 22, 2004, available at <http://www.treas.gov/press/releases/js1455.htm> (noting that “capital charges resulting from chronic—widespread and persistent—fails soak up dealer capital that might otherwise be used to support profit-making activities, thereby focusing management attention on the underlying fails problem and incentivizing managers to remedy the situation.”).

was greater than zero.¹³ As long as a seller could earn more than a *de minimis* amount of interest on a special collateral repo, it made economic sense to lend the money, earn the interest, and avoid the fail.

¹³ Using economic terminology, let R_{gc} denote the general collateral repo rate and R_{sp} denote the special collateral repo rate for the security. The specialness spread $R_{gc} - R_{sp}$ will be less than R_{gc} if and only if R_{sp} is greater than zero.

3.3 Equilibrium in the Market for Special Collateral Repos

The market for borrowing and lending a particular Treasury security comes into equilibrium as a result of fluctuations in the special collateral repo rate for the security *relative to* the Treasury general collateral repo rate. If the demand to borrow the security is modest relative to the supply available for lending, a market participant seeking to borrow the security will usually be able to lend its money at a specials rate no lower than about 15 to 25 basis points below the general collateral repo rate. However, if the demand to borrow the security expands, some borrowers (in order to avoid failing) will be willing to accept less interest on the money they lend. Downward pressure on the specials rate for the security relative to the general collateral repo rate makes lending the security more remunerative, thereby attracting additional lenders. It may also ration some borrowers out of the market, particularly short sellers who decide to liquidate their short positions rather than continue to finance those positions on special collateral repos earning lower rates of interest. The collateral market will return to equilibrium, that is, to a state where the quantity of the security sought to be borrowed at the prevailing specials rate equals the quantity of the security available for lending at that rate, when the lower specials rate has attracted enough new lenders and/or rationed enough borrowers out of the market.

4. FEDERAL RESERVE AND INDUSTRY EFFORTS TO MITIGATE SETTLEMENT FAILS

Treasury market participants have an interest in mitigating settlement fails in order to limit their net interest expenses as well as their exposure to the risk of counterparty insolvency—a risk explained in Box 2. The Federal Reserve has a separate interest in mitigating settlement fails to maintain the liquidity and efficiency of the market in which it conducts open market operations. (A high volume of fails can lead market participants to reduce, or even withdraw from, their normal activities. Such activities include dealers making markets for customers, investors lending securities to dealers to facilitate settlement of dealer sales, and arbitrageurs seeking to exploit, and thereby eliminate, price relationships that present abnormal profit opportunities.)

Since 1969, the Federal Reserve has sought to mitigate settlement fails by lending Treasury securities to primary dealers to facilitate settlement of dealer sales.¹⁴ (However, the Federal Reserve lends against collateral, rather than cash, to insulate the supply of reserves available to the banking system

from securities lending operations.) Pursuant to the terms and conditions of the lending program in effect in mid-2008,¹⁵ each business day at noon the Federal Reserve Bank of New York offered to lend on an overnight basis up to 90 percent of the amount of each Treasury security beneficially owned in the Federal Reserve's System Open Market Account (SOMA), subject to an upper limit of the amount of an issue actually in

Treasury market participants have an interest in mitigating settlement fails in order to limit their net interest expenses as well as their exposure to the risk of counterparty insolvency.

the account.¹⁶ Primary dealers bid for a security by specifying the quantity desired (in increments of \$1 million) and the overnight loan fee they were willing to pay, expressed as a rate per annum, subject to a minimum fee of 50 basis points.¹⁷ Bidding closed at 12:15 p.m. and loans were awarded to the highest bidders at their bid rates¹⁸ until all of the securities available for lending were allocated or all of the bidders had been satisfied.¹⁹ During the first six months of 2008, the Federal Reserve Bank of New York lent an average of \$12.2 billion of securities per day, distributed over an average of twenty-three different issues, at an average loan fee of 61 basis points per annum.

¹⁴ In authorizing the loan of Treasury securities from the System Open Market Account in 1969, the Federal Open Market Committee stated that the action “was taken after the Manager [of the System Open Market Account] had advised that the problem of delivery failures in the Government securities market had worsened significantly over the past year, partly because private facilities for lending such securities had become inadequate; that delivery failures were markedly impairing the performance of the market; and that the functioning of the market would be improved if securities held in the System Open Market Account could be lent, for the express purpose of avoiding delivery failures, to Government securities dealers doing business with the Federal Reserve Bank of New York” (Federal Reserve *Bulletin*, January 1970, p. 32).

¹⁵ “SOMA Securities Lending Program Terms and Conditions (Revised),” Federal Reserve Bank of New York, August 22, 2008, available at <http://www.newyorkfed.org/newsevents/news/markets/2008/an082208.html>. Details of the history of the Fed's lending program appear in Fleming and Garbade (2007).

¹⁶ In order to avoid failing itself, the Fed does not agree to lend securities unless it has actual possession of the securities at the time of an auction. Thus, it will not agree to lend securities that it lent the preceding business day and that have not yet been returned.

¹⁷ A loan fee for a security is approximately equivalent to the security's specialness spread. See Fleming and Garbade (2007). The minimum fee avoids crowding out private lenders when security loan markets are functioning normally, but it has been reduced to nearly zero when those markets are not functioning well.

¹⁸ The auction for each security is a discriminating, or multiple-price, auction.

Treasury market participants have also acted cooperatively to mitigate settlement fails and otherwise reduce the cost of settling transactions. Between 1986 and 1988, dealers in Treasury securities organized the Government Securities Clearing Corporation (GSCC) to serve as a central counterparty in interdealer transactions in Treasury and related securities. As explained earlier, multilateral net settlement through a central counterparty economizes on the quantity of securities that have to be delivered to settle a given volume of transactions. GSCC also implemented a trade confirmation protocol that essentially eliminated interdealer fails due to miscommunication between dealers, as well as a procedure for marking failed trades to current market prices that materially reduced the consequences of counterparty insolvency. The GSCC extended its net settlement system to include Treasury auction takedowns in 1994 and repurchase agreements in 1995.²⁰ In 2002, GSCC became a wholly owned subsidiary of Depository Trust & Clearing Corporation and was renamed the Fixed Income Clearing Corporation.

5. CHRONIC SETTLEMENT FAILS

Demand to borrow a security (relative to the supply available for lending) can sometimes be large enough to drive the specials rate for the security down to near zero. Prior to May 2009, sellers would then become largely indifferent between a) failing and b) borrowing the security to avoid failing. In this extreme case, any unsatisfied demand to borrow would spill over into fails. Fails could expand further if security lenders, observing a growing incidence of settlement fails, declined to continue lending out of concern that their securities may not be returned on a timely basis.²¹ Fails could expand still further if, as explained in Box 3, market participants concluded that they could acquire a cheap option on a future increase in a specials rate by contracting to sell a security in a special collateral repo and then strategically failing to deliver the security. More generally, settlement fails could become *chronic* when the specials rate for a security was driven down to near zero.

Three episodes of chronic fails have been described in the literature: in May and June of 1986,²² following the terrorist attack on the World Trade Center on September 11, 2001,²³ and during the summer of 2003.²⁴

¹⁹ Awards were subject to three limitations: 1) no dealer could have outstanding borrowings of more than 25 percent of the amount of an issue beneficially owned in the System Open Market Account, 2) no dealer could have outstanding borrowings of more than \$750 million of any single issue, and 3) no dealer could have outstanding borrowings of more than \$3 billion of securities in total.

²⁰ See Garbade and Ingber (2005) and Ingber (2006).

²¹ This can quickly lead to a self-reinforcing and destabilizing cycle, with lenders withdrawing collateral out of a concern that borrowers may fail to return the securities, thereby increasing the incidence of settlement fails and triggering further collateral withdrawals.

Box 3

Strategic Fails

When the specials rate for a security is close to zero in a market without a fails charge convention, a market participant with no position in the security may sometimes agree to lend the security on a term repurchase agreement and then fail, intentionally, on the starting leg of the repo.

Suppose, for example, the three-week specials rate for a five-year note is 10 basis points and that XYZ Co. believes the specials rate will be 50 basis points in one week. If XYZ contracts (in the specials market) to borrow \$50 million for three weeks against lending the note, it will owe interest of \$2,917 at the end of three weeks.^a It will owe this amount even if it fails to deliver the note any time during the three-week interval.

XYZ Co. has effectively purchased (for \$2,917, payable in three weeks) an option on an exchange of \$50 million for the five-year note at any time during the next three weeks for the balance of the three-week interval.

XYZ could choose to let its option expire unexercised and simply pay the \$2,917 premium at the end of three weeks. However, if XYZ Co.'s expectations prove correct, it can exercise the option after one week by borrowing the five-year note for two weeks against lending \$50 million at 50 basis points (earning interest of \$9,722^b) and delivering the note in (delayed) settlement of its earlier negotiated three-week repurchase agreement. The \$50 million received from delivering the note funds the loan that allows XYZ Co. to borrow the note, and XYZ Co. has net interest earnings of \$6,805 (\$6,805 = \$9,722 interest income, less \$2,917 interest expense).

More generally, a very low specials rate presents an opportunity to speculate on an increase in the rate—by lending on, and then failing on, a special collateral repurchase agreement—with limited downside exposure.^c In the limit, a repo rate of zero may be viewed by some participants as a “risk-free” opportunity to intentionally fail and either profit or break even. Such practices can lead to an increase in aggregate settlement fails and the associated indirect costs discussed in Box 2.

^a $\$2,917 = (21/360) \times 0.10 \text{ percent per annum} \times \50 million .

^b $\$9,722 = (14/360) \times 0.50 \text{ percent per annum} \times \50 million .

^c Strategic fails are noted in Fleming and Garbade (2002, p. 47), Fleming and Garbade (2004, pp. 3-4), and in “Remarks by Jeff Huther, Director of the Office of Debt Management to the Bond Market Association’s Annual Meeting,” April 22, 2004, available at <http://www.treas.gov/press/releases/js1455.htm>.

²² Cornell and Shapiro (1989). Cornell and Shapiro do not discuss fails directly, but do document a near-zero specials rate for the 9 1/4 percent Treasury bond of February 2016 and discuss the reasons for that low rate. The existence of widespread settlement fails in the issue was common knowledge among market participants at the time.

²³ Fleming and Garbade (2002).

²⁴ Fleming and Garbade (2004). See also Fleming and Garbade (2005).

5.1 The 1986 Episode

An “on-the-run” Treasury security is the most recently auctioned security in a given series, such as the most recently auctioned six-month bill or ten-year note. In late April 1986, dealers began to sell the on-the-run thirty-year Treasury bond (the 9 1/4 percent bond of February 2016) short in anticipation of bidding for the new thirty-year bond that would be announced on April 30 and auctioned on May 8 for settlement on May 15.²⁵ Such short selling in advance of an auction announcement was normal and customary dealer behavior.²⁶ However, dealers soon found themselves unable to borrow enough 9 1/4 percent bonds to finance their short positions, in part because a significant quantity of the bonds was owned by investors who declined to lend.²⁷ Strong dealer demand and limited supply combined to drive the special collateral repo rate for the bonds down to about 5 basis points, and dealers began to fail on their settlement obligations. Failing, however, was expensive because the Treasury general collateral repo rate was about 6.75 percent, so dealers with short positions had an economic incentive to cure their fails another way: by buying (rather than borrowing) the 9 1/4 percent Treasury bonds and delivering the purchased bonds—thereby closing out their short positions. They bid up the price of the 9 1/4 percent bonds, relative to the prices of other Treasury bonds with similar maturities, until the higher price induced holders to sell the 9 1/4 percent bonds and replace them with higher yielding substitutes, thereby allowing dealers to cover their short positions.²⁸

²⁵ Department of the Treasury, Securities and Exchange Commission, and Board of Governors of the Federal Reserve System (1992, p. B-1, footnote 1) (“participants sold the outstanding 9 1/4 percent bond . . . to prepare for the roll into the WI [“when-issued”] thirty-year bond.”). Following the announcement of the forthcoming auction, dealers planned to buy the on-the-run thirty-year bond (thereby covering their previous short sales of that bond) against selling the WI thirty-year bond short. The transactions would leave them with short positions in the WI bond that they could cover in the auction.

²⁶ Department of the Treasury, Securities and Exchange Commission, and Board of Governors of the Federal Reserve System (1992, p. 10, footnote 11) (“dealers . . . sold [the 9 1/4 percent bond] short as part of a trading strategy that had worked in the past as they prepared to bid for a new thirty-year bond.”). The sequence of shorting the on-the-run thirty-year, rolling the short into the WI thirty-year, and then bidding to buy the WI thirty-year in the auction was part of the process whereby dealers distributed new bonds to market participants.

²⁷ Department of the Treasury, Securities and Exchange Commission, and Board of Governors of the Federal Reserve System (1992, p. 10, footnote 11; p. B-1, footnote 1) (“some institutional investors did not make the [9 1/4 percent bonds] available to the repo market” and “securities needed to [finance] short positions were not readily available to the repo market.”).

²⁸ Cornell and Shapiro (1989, pp. 303-4) suggest that the 9 1/4 percent bond of February 2016 was overvalued by as much as 7 percent of principal value compared with one close substitute (the 9 7/8 percent bond of November 2015).

5.2 The 2001 Episode

The 2001 fails episode was attributable, in the first instance, to the terrorist attack on the World Trade Center on September 11, 2001. The attack destroyed the offices of several interdealer brokers and impaired telecommunication services throughout lower Manhattan. GSCC recorded \$266 billion in interdealer settlement fails on September 11 and \$440 billion in interdealer fails on September 12.²⁹ Sellers tried to borrow the securities

Settlement fails began to shrink to more normal levels after the Treasury reopened the on-the-run ten-year note in an extraordinary unscheduled auction offering on Thursday, October 4, and after officials indicated that they might reopen the on-the-run five-year note as well.

needed to cure their fails but holders realized that, in view of the severe operational problems, their securities might not be returned on a timely basis and they consequently declined to lend.³⁰ The contraction in the supply of collateral pushed special rates to near zero and settlement fails remained elevated. Daily average fails in Treasury securities reported by primary dealers to the Federal Reserve³¹ reached \$200 billion per day during the week of September 13-19 and continued high through early October. Settlement fails were particularly high for the on-the-run five-year note (the 4 5/8 percent note

²⁹ Fleming and Garbade (2002, p. 46).

³⁰ See “After Attack, Settlement Woes Still Clogging Repo Market,” *Dow Jones Newswires*, September 26, 2001, 9:05 (noting “a general reluctance among large portfolios to lend their securities” and “in a chain reaction, the fear of failing trades is ‘causing portfolio managers, securities lending desks and foreign central banks to hold even tighter on to their collateral,’ which is exacerbating the situation . . .”); “Treasury Market is Faced with Incomplete Trades,” *Wall Street Journal*, October 3, 2001, p. C10 (“Because of the rate of fails . . . dealers are reluctant to use their securities as collateral. They are worried that they might not have securities delivered to them . . .”); “U.S. Sells \$6 Billion in 10-Year Notes to Help Overcome Shortage,” *Bloomberg News*, October 4, 2001, 13:16 (quoting Peter Fisher, Under Secretary of the Treasury for Domestic Finance, as saying that “the cause of the fails is [in part] the result of . . . reluctance by institutional investors to lend into a market that is suffering from extraordinarily high fails levels.”); and “U.S. Acts on Shortage of Treasuries,” *New York Times*, October 5, 2001, p. C1 (“With the prospect that securities might not be returned, both dealers and large investors have become unwilling to lend them in the repo market.”).

³¹ Fleming and Garbade (2005) describe the settlement fails data reported by primary dealers to the Federal Reserve. Unless otherwise noted, this article measures settlement fails as the daily average over weekly intervals of the average of cumulative primary dealer fails to receive Treasury securities during a week and primary dealer fails to deliver Treasury securities over the same week. The Federal Reserve does not publish data on settlement fails on a day-by-day basis.

of May 2006) and the on-the-run ten-year note (the 5 percent note of August 2011).

Settlement fails began to shrink to more normal levels after the Treasury reopened the on-the-run ten-year note in an extraordinary unscheduled auction offering on Thursday, October 4, and after officials indicated that they might reopen the on-the-run five-year note as well.³² Peter Fisher, the Under Secretary of the Treasury for Domestic Finance, stated that the Treasury reopened the ten-year note “to reduce the risk that . . . settlement problems turn into a much bigger problem for the Treasury market”³³ Fisher went on to observe that “we have something that is self-compounding. There is some point at which your fails pile up, and that is the point at which you damage the price-discovery process and the smooth operating of the Treasury market.”

The actions of Treasury officials convinced market participants that the Treasury would take unprecedented steps to facilitate settlements and maintain market liquidity. Holders of the on-the-run five- and ten-year notes began to make the notes available, and the level of fails subsided.³⁴

5.3 The 2003 Episode

The 2003 fails episode was attributable, in the first instance, to a heavy volume of short sales of the on-the-run ten-year note (the 3 5/8 percent note of May 2013) in late June 2003 by market participants seeking to hedge their interest rate risk on long positions in other fixed-income securities.³⁵ The short sales created an unusually large demand to borrow the note that drove the specials rate for the note down to zero, after which the residual, unsatisfied demand spilled over into fails. The fails became chronic when investors began to withdraw from lending the note. Daily average fails in Treasury securities reported by primary dealers to the Federal Reserve went from

³² “U.S. Sells \$6 Billion in 10-Year Notes to Help Overcome Shortage,” *Bloomberg News*, October 4, 2001, 13:16, and “U.S. Acts on Shortage of Treasuries,” *New York Times*, October 5, 2001, p. C1 (both quoting the Under Secretary of the Treasury for Domestic Finance as saying that the Treasury might reopen the five-year note in the next week).

³³ “U.S. Acts on Shortage of Treasuries,” *New York Times*, October 5, 2001, p. C1.

³⁴ See, for example, “Remedial Reopenings and the Treasury Supply Outlook,” *Money Market Observer*, October 8, 2001 (“Dealers reported a dramatic reduction in the volume of fails on [October 5] after the settlement of the additional \$6 billion of ten-year notes”), and “Another Emergency Treasury Sale Looks Unlikely as Shortages that Hamstrung ‘Repo Market’ Ease,” *Wall Street Journal*, October 11, 2001, p. C17.

³⁵ “Supply Dries Up Following Fall in Prices,” *Financial Times*, August 23, 2003, p. 27 (reporting that “Demand for Treasuries from some quarters has also risen as prices have fallen because many institutions want to borrow the securities and ‘short’ them in the expectation that prices will continue to drop. Traders say hedged positions for the [on-the-run ten-year note] now exceed the amount of Treasury securities available.”).

\$25 billion per day during the week ending June 18 to \$103 billion per day during the week ending July 2, and topped out at \$232 billion per day during the week ending August 20. Settlement fails persisted for months³⁶ and were not fully resolved until the end of the year, following an offering of a new series of ten-year notes in November.³⁷

5.4 Proposals to Mitigate Chronic Settlement Fails

The 2003 episode had a strong impact on the thinking of market participants. Unlike the 1986 episode, which was short-lived and quickly forgotten, and unlike the 2001 episode, which clearly stemmed from unusual circumstances, the 2003 episode was lengthy, large-scale, and stemmed from a marketplace

The 2003 [fails] episode raised the question of whether something should be done, by government officials or by private sector market participants, to mitigate chronic fails.

activity—hedging—that was a very ordinary occurrence. The 2003 episode raised the question of whether something should be done, by government officials or by private sector market participants, to mitigate chronic fails.

The key difference between the 1986 and 2003 episodes was the level of the Treasury general collateral repo rate. In May 1986, the overnight general collateral repo rate was about 6.75 percent. That made it costly to continue to fail even after the special collateral repo rate on the 9 1/4 percent bonds of February 2016 had been driven down to near zero and the economic incentive to avoid failing by borrowing the bonds had been eliminated. The high cost of failing incentivized short sellers to cover their short positions with outright purchases, and they bid up the price of the 9 1/4 percent bonds to a level that gave holders an economic incentive to swap out of the issue and into higher yielding substitutes.

In mid-2003, however, the overnight Treasury general collateral repo rate was about 1 percent, so the cost of failing was modest. Short sellers had little incentive to cover their

³⁶ See, for example, “Treasury Issue Remains a Headache,” *Wall Street Journal*, November 17, 2003, p. C13.

³⁷ “California Standoff Dims Prospects,” *Wall Street Journal*, December 9, 2003, p. C17 (reporting “progress for the . . . May ten-year note, which traders said appeared to be emerging from six months of gridlock, thanks to supply that entered the market last week. The note was trading in positive territory in the repurchase-agreement market. For months, it had been stuck at 0% . . .”).

short positions with outright purchases after demand to borrow the May 2013 ten-year note had driven the specials rate on the note down to near zero and eliminated the incentive to borrow the note to avoid failing.

Market participants and government officials learned from the 2003 episode that settlement fails were liable to become chronic quickly when short-term interest rates are low,³⁸ and they began to contemplate institutional innovations to avoid, or at least mitigate, chronic settlement fails. Most discussions centered around three possibilities:

- a regular program to reopen an issue when settlement fails in the issue become chronic,
- a securities lending facility run by the Treasury Department, and
- a fee to be paid by failing sellers to their counterparties to incentivize the sellers to resolve their fails.

Reopenings: Reopening an issue to alleviate chronic fails was exactly what the Treasury did when it reopened the on-the-run ten-year note on October 4, 2001.³⁹ However, Treasury officials were reluctant to institutionalize reopenings as a device to mitigate chronic fails. Three months after the 2001 reopening, Under Secretary Fisher told market participants that while “it would be imprudent of me to say that the Treasury will never again hold such an auction . . . you should not count on it, you should not expect it . . .”⁴⁰ The problem was that reopenings in response to chronic fails ran counter to “regular and predictable” issuance, a cornerstone of Treasury debt management since the 1970s.⁴¹ Treasury officials were concerned that the uncertainties engendered by an

³⁸ See, for example, “Remarks by Jeff Huther, Director of the Office of Debt Management, to the Bond Market Association’s Annual Meeting,” Department of the Treasury, April 22, 2004, available at <http://www.treas.gov/press/releases/js1455.htm> (“The heart of the pricing problem last year was, unquestionably, the low federal funds rate and the consequently low ceiling on the cost of financing a short position.”); Department of the Treasury (2006, p. 26, p. 174, footnote 2) (“The potential for chronic fails episodes thus increases in a very low interest rate environment such as that prevailing during the summer of 2003.”); and “Statement of Under Secretary for Domestic Finance Randal K. Quarles to Bond Market Association Annual Meeting,” Department of the Treasury, May 19, 2006, available at <http://www.treas.gov/press/releases/js4274.htm> (“When the central bank wishes to establish very low short-term rates, the maximum degree of specialness will be quite small. During these periods, we might expect to see greater incidence of fails episodes because the cost of failing is low.”).

³⁹ That reopening was not the first time the Treasury increased the supply of a security in response to unusual market conditions. On November 3, 1992, the Treasury announced that it would reopen the 6 3/8 percent note of August 2002, at that time the on-the-run ten-year note, “in order to alleviate an acute, protracted shortage” of the note. See “Treasury November Quarterly Financing,” Office of Financing, Department of the Treasury, November 3, 1992.

⁴⁰ “Remarks by Peter R. Fisher, Under Secretary of the Treasury for Domestic Finance, Before the Bond Market Association Legal and Compliance Conference,” January 8, 2002, available at <http://www.treas.gov/press/releases/po.906.htm>.

unpredictable reopening program would raise borrowing costs over the long run.⁴²

A Treasury lending facility: Like reopenings, a *Treasury lending facility* would involve additional issuance from the Treasury. Unlike reopenings, a *Treasury lending facility* would increase supply on only a temporary basis. Such a facility was put forth as a “straw man” in a Treasury white paper published

Market participants and government officials learned from the 2003 episode that settlement fails were liable to become chronic quickly when short-term interest rates are low.

in May 2006.⁴³ The white paper was written to stimulate public discussion of mechanisms to make available “an additional, temporary supply of Treasury securities on rare occasions when market shortages threaten to impair the functioning of the market for Treasury securities and broader financial markets . . .”

However, Treasury officials questioned whether the Secretary of the Treasury has statutory authority to issue securities on a temporary basis to alleviate chronic settlement fails. Federal law provides that “the Secretary of the Treasury may borrow on the credit of the United States Government amounts necessary for expenditures authorized by law and may issue bonds of the Government for the amounts borrowed.”⁴⁴ Similar provisions authorize the issuance of notes and bills.⁴⁵ The 2006 Treasury white paper suggested that “the Treasury would likely need to pursue new authority to issue securities for the purpose of securities lending. . . .”⁴⁶

⁴¹ Garbade (2007) describes the emergence of “regular and predictable” as a Treasury debt management strategy.

⁴² See “Remarks of Undersecretary of the Treasury Peter R. Fisher to the Futures Industry Association, Boca Raton, Florida,” March 14, 2002, available at <http://www.treas.gov/press/releases/po1098.htm>.

⁴³ Department of the Treasury (2006). The public responses to the white paper are available at <http://www.ustreas.gov/offices/domestic-finance/debt-management/slf-comments.pdf>. See also Garbade and Kambhu (2005).

A Treasury lending facility was also recommended by the Treasury Borrowing Advisory Committee following the chronic fails of late September and early October 2001; see “Report to the Secretary of the Treasury from the Treasury Advisory Committee of the Bond Market Association,” October 30, 2001, available at <http://www.ustreas.gov/offices/domestic-finance/debt-management/adv-com/reports/rpt-2001-q4.pdf> (“members overwhelmingly felt that Treasury should expand their ability to enhance liquidity in the Treasury market. To accomplish this, they could set up a repo facility to help alleviate protracted shortages, in particular, large and persistent fails . . .”).

⁴⁴ 31 U.S.C. § 3102 (2010).

⁴⁵ See 31 U.S.C. § 3103-3104 (2010).

⁴⁶ Department of the Treasury (2006, pp. 26, 178).

A fails charge: In 2002, two economists at the Federal Reserve Bank of New York suggested that “chronic fails can also be alleviated by increasing the cost of failing with a penalty fee.”⁴⁷ The economists noted that such a fee would give sellers an economic incentive to borrow securities to avoid failing even when the special collateral repo rate for the securities was close to zero. They further noted that a fails charge might lead market participants to borrow securities against lending money at *negative* specials rates (in order to avoid the fails charge) and that such negative specials rates could attract additional securities lenders (because they would receive, rather than pay, interest on the money they borrowed against lending securities).

The economists suggested that a fails charge might be set at some threshold rate minus the general collateral repo rate, with a minimum of zero.⁴⁸ The fails charge would be above zero only if the general collateral repo rate was below the threshold rate and would not be higher than what was necessary to bring the total cost of failing to the threshold rate. (For example, if the threshold rate is 5 percent and the general collateral repo rate is 3 percent, the fails charge would be 2 percent and the total cost of failing would be 5 percent.) They further suggested that the fails charge could be instituted through a “good-practice” recommendation of the Bond Market Association.⁴⁹ The economists noted that a fails charge could be implemented implicitly by reducing the invoice price on a transaction each day the seller fails—a material departure from the existing convention of deferring settlement at an unchanged invoice price—but observed that “the operational burden of changing an invoice price following a delay in settlement would undoubtedly be substantial.”⁵⁰

5.5 Inaction prior to the Insolvency of Lehman

Following the 2003 episode of chronic settlement fails, both government officials and private sector market participants understood that chronic fails are prone to blossom in an environment of low interest rates. Several parties had identified ways to address the problem, but each of the suggestions had a material deficiency. Treasury officials asked private sector participants to address the problem, but nothing substantive came of their requests.⁵¹ No significant progress was made with

⁴⁷ Fleming and Garbade (2002, p. 52).

⁴⁸ Fleming and Garbade (2002, p. 53).

⁴⁹ The Bond Market Association joined with the Securities Industry Association in 2006 to form the Securities Industry and Financial Markets Association.

⁵⁰ Fleming and Garbade (2002, p. 52).

respect to addressing the problem of chronic fails before the insolvency of Lehman in the fall of 2008.

6. CHRONIC SETTLEMENT FAILS IN THE WAKE OF THE INSOLVENCY OF LEHMAN

The announcement, early in the morning of Monday, September 15, 2008, that Lehman was insolvent triggered a “flight to safety” that, by the close of trading that day, pushed the yield on four-week Treasury bills down to 36 basis points,

The first response to the rising tide of settlement fails was the decision of the Federal Reserve to relax the terms of its securities lending program.

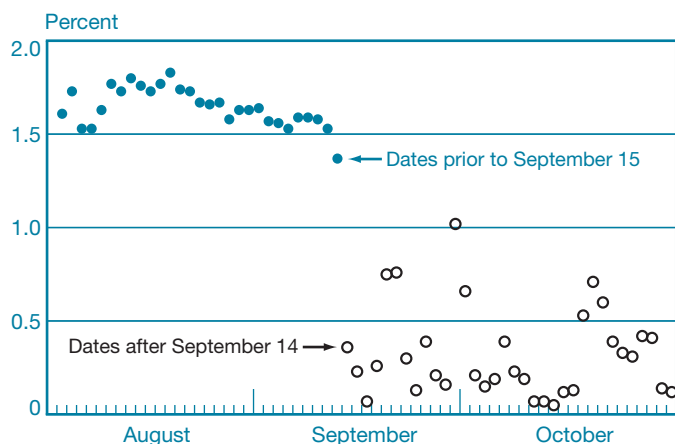
100 basis points lower than the yield on the preceding Friday. Yields on longer term bills also moved sharply lower. By the close of trading on Wednesday, September 17, yields on four-week bills were down to 7 basis points. Over the balance of the month, four-week-bill yields fluctuated between about 10 basis points and 100 basis points—well below the 1.50 to 1.85 percent range that had prevailed since the beginning of August (Chart 1).

Greater demand for high-quality, short-term debt also drove down repo rates on Treasury collateral. The overnight Treasury general collateral repo rate averaged 90 basis points between September 15 and September 30, well below the 2 percent level that had prevailed during the preceding six weeks (Chart 2).

In the wake of Lehman’s insolvency and in the midst of the ensuing flight to safety, investors became increasingly reluctant to lend Treasury securities.⁵² Unable to replace their maturing borrowings, dealers began to fail on their delivery obligations.

⁵¹ “Minutes of the Meeting of the Treasury Borrowing Advisory Committee,” November 4, 2008, available at <http://www.treas.gov/press/releases/hp1239.htm> (stating that “Since November 2003, Treasury has repeatedly asked the private sector to address [the fails] issue proactively. On several occasions, market participants have emphatically stated that they would resolve the situation without government intervention, but such steps have not been implemented.”). See also Wrightson, *Federal Reserve Data*, October 17, 2008 (stating that “the repo market has managed to fend off regulatory reform in past cycles.”), and “The Treasury Market Reaches Breaking Point,” *Euromoney*, December 1, 2008 (quoting a former Treasury employee as saying that “It was politically difficult to convince the market to put a stop to fails to deliver in treasuries. There were some forceful voices insisting that if the Treasury got involved, they would take the incentives out of the specials market altogether. Those making their living as specialist dealers, as well as those making a living shorting securities outright, were worried about potential supply changes which would eliminate trading opportunities for them.”).

CHART 1
Yields on Four-Week Treasury Bills
August to October 2008



Source: Federal Reserve Statistical Release H.15.

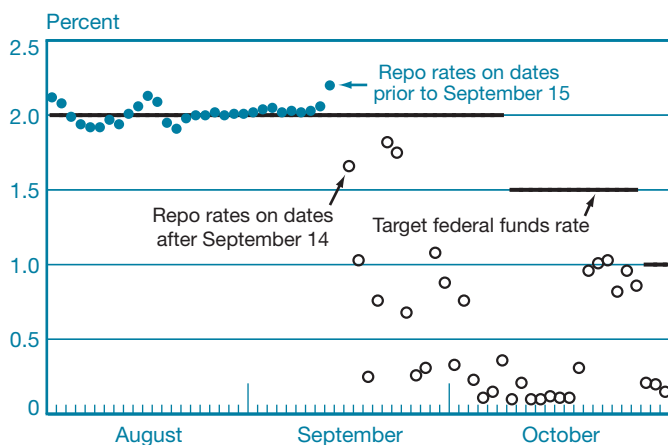
The fails persisted because the low general collateral repo rate left sellers with little incentive to cure the fails. Primary dealer settlement fails in Treasury securities mushroomed to an average of \$253 billion per day during the week of Thursday, September 18, to Wednesday, September 24—far in excess of the level that had prevailed in August and the first half of September (Chart 3). And unlike earlier episodes, fails in the wake of Lehman’s insolvency were not concentrated in one or two issues; rather, they involved securities across the entire yield curve.

The first response to the rising tide of settlement fails was the decision of the Federal Reserve to relax the terms of its securities lending program. As shown in Table 1, on Tuesday, September 23, the Fed raised the limit on total borrowings by a single dealer from \$3 billion to \$4 billion. Loans to primary dealers from the SOMA portfolio reached new heights but primary dealer settlement fails continued to rise, averaging \$342 billion per day over the interval from September 25 to October 8 (Chart 3).

On Wednesday, October 8, both the Federal Reserve and the Treasury acted in response to the continuing crisis. The Federal Reserve further eased the terms of its securities lending program by reducing the minimum loan fee from 50 basis

⁵² “Demand for Short-Term Treasury Debt Puts a Crimp in World-Wide Supply,” *Wall Street Journal*, September 25, 2008, p. C1 (reporting that “some foreign central-bank officials ... are reluctant to lend out their safest collateral—U.S. Treasuries.”); “U.S. Treasury Steps Up Debt Sales to Reduce Shortages (Update 2),” *Bloomberg.com*, October 8, 2008, 12:43 EDT (quoting the head of interest rate strategy at Credit Suisse Securities as saying that “people are so nervous about the financial crisis that they’re holding on to their collateral and not lending it out.”); and “More Treasury Bonds on Way to Ease Crisis,” *Wall Street Journal*, October 9, 2008, p. A6 (reporting that “investors have been unwilling to lend Treasury securities to other market participants.”).

CHART 2
Target Federal Funds Rates and Rates on
Overnight General Collateral Repurchase
Agreements on Treasury Securities
August to October 2008



Sources: Federal Reserve Statistical Release H.15; Board of Governors of the Federal Reserve System.

points to 10 basis points and by expanding the limit on total borrowings by a single dealer to \$5 billion (Table 1). Treasury officials took the unprecedented step of reopening *four* off-the-run Treasury notes, announcing at 10:40 a.m. that they would “reopen multiple securities which have created severe dislocations in the market causing acute, protracted shortages.”⁵³ Two of the reopened notes were auctioned later the same day (at 11:30 a.m. and 1:00 p.m., respectively), and the other two notes were auctioned the following day (Table 2). The decision to reopen a substantial amount (\$10 billion each) of so many different notes made clear the scale of the fails problem; the decision to auction one note with less than an hour of notice and a second note with less than three hours of notice emphasized the urgency of the situation.

Although the reopenings helped to mitigate settlement fails in the issues that were reopened, aggregate primary dealer Treasury fails continued to rise, reaching a daily average level of \$379 billion per day over the interval from October 9 to October 22 (Chart 3). Comments to the effect that “Treasury market functioning remains impaired” and “the repo market is not functioning” became commonplace. On October 17, a widely read market letter remarked that “the breakdown in the clearing mechanism for the Treasury market is beginning to emerge as a top-tier policy concern.”⁵⁴

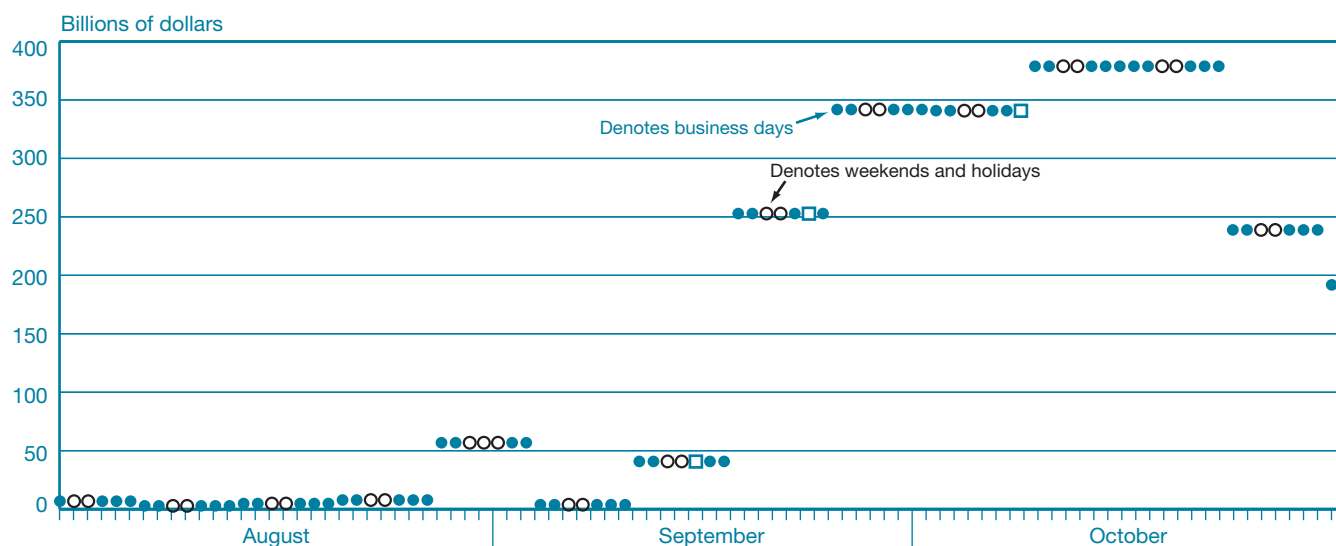
⁵³ U.S. Department of the Treasury, “Statement on Treasury Market Conditions and Debt Management Actions,” October 8, 2008, available at <http://www.treas.gov/press/releases/hp1186.htm>.

⁵⁴ Wrightson, *Federal Reserve Data*, October 17, 2008.

CHART 3

Daily Average (Over Weekly Intervals) Primary Dealer Settlement Fails in Treasury Securities

August to October 2008



Source: Federal Reserve Bank of New York.

Notes: The first square marks the Lehman insolvency on Monday, September 15. The second square marks the effective date of a revision in the terms and conditions of the Federal Reserve System Open Market Account (SOMA) securities lending program on Tuesday, September 23.

The third square marks the announcement of the surprise reopening of four Treasury notes on Wednesday, October 8, and the effective date of a further revision in the terms and conditions of the SOMA securities lending program on the same day.

TABLE 1

Terms and Conditions of Federal Reserve Security Loan Auctions

Effective Date	Theoretical Amount of a Single Issue Offered (Percentage of SOMA Holdings) ^a	Minimum Loan Fee (Basis Points)	Limits on Outstanding Borrowings by a Single Dealer	
			Per Issue	Total
Terms and conditions prior to Lehman insolvency				
November 26, 2007	90	50	Lesser of \$750 million and 25 percent of amount beneficially owned in SOMA portfolio	\$3 billion
Post-Lehman terms and conditions				
September 23, 2008	90	50	Lesser of \$750 million and 25 percent of amount beneficially owned in SOMA portfolio	\$4 billion
October 8, 2008	90	10	Lesser of \$750 million and 25 percent of amount beneficially owned in SOMA portfolio	\$5 billion
December 18, 2008 ^b	90	1	Lesser of \$750 million and 25 percent of amount beneficially owned in SOMA portfolio	\$5 billion

Source: Federal Reserve Bank of New York.

Notes: SOMA is the Federal Reserve System Open Market Account. Entries in bold indicate a change in terms.

^aAmount actually offered is the lesser of the theoretical amount offered and the amount of the issue actually in the SOMA account at the time of an auction.^bLast revision prior to the end of 2008.

TABLE 2

Treasury Notes Reopened in October 2008

	4 1/8 Percent Note Maturing May 15, 2015	4 1/4 Percent Note Maturing August 15, 2015	4 Percent Note Maturing February 15, 2015	3 1/2 Percent Note Maturing February 15, 2018
Amount offered	\$10 billion	\$10 billion	\$10 billion	\$10 billion
Auction date and time	October 8, 2008, 11:30 a.m.	October 8, 2008, 1:00 p.m.	October 9, 2008, 11:30 a.m.	October 9, 2008, 11:30 a.m.
Issue date	October 15, 2008	October 15, 2008	October 15, 2008	October 15, 2008
Amount bid competitively	\$12.1 billion	\$21.1 billion	\$23.7 billion	\$23.1 billion
Closing market yield on October 7, 2008 (percent)	2.87	2.98	2.79	3.57
Auction yield (percent)	3.31	3.44	3.23	3.79
Closing market yield on October 9, 2008 (percent)	3.35	3.57	3.22	3.92

Sources: U.S. Treasury Department; *Wall Street Journal*.

Note: Over the interval from October 7 to October 9, the closing market yield on the on-the-run five-year note (the 3 1/8 percent note of September 30, 2013) rose from 2.47 percent to 2.79 percent and the closing market yield on the on-the-run ten-year note (the 4 percent note of August 2018) rose from 3.50 percent to 3.81 percent.

7. THE TMPG STEPS UP

By mid-October 2008, Treasury and Federal Reserve officials and private sector market participants understood that the volume and persistence of settlement fails in Treasury securities was a major problem, but what could or should be done was far from obvious. The four reopenings had reduced fails in the reopened notes, but speculation over whether the Treasury would reopen other chronically failing issues was contributing to unwanted volatility in the prices of other Treasury securities. Additionally, there was some indication that the reopenings had not been well received. The first auction, of \$10 billion of the 4 1/8 percent notes of May 2015, attracted only \$12.1 billion of tenders, and the notes were sold at a price almost 3 points below where outstanding notes of the same series traded prior to the auction.

An alternative approach was to revise the market convention of postponing—without any explicit penalty and at an unchanged invoice price—a seller’s obligation to deliver Treasury securities if the seller failed to deliver the securities on a scheduled settlement date. However, precisely because the treatment of settlement fails was a matter of market convention, rather than law or regulation, it could not be changed except through widespread adoption of an alternative convention.

Fortuitously, in early 2007 the Federal Reserve Bank of New York had sponsored the organization of a new forum—the Treasury Market Practices Group—for discussing Treasury

market practices and for advocating the adoption of practices deemed to be in the best interests of the market.⁵⁵

The TMPG is a group of private sector market professionals committed to supporting the integrity and efficiency of the market for U.S. Treasury securities. Membership includes senior business managers and legal and compliance professionals from broker-dealer firms, banks, buy-side firms,

The TMPG is a group of private sector market professionals committed to supporting the integrity and efficiency of the market for U.S. Treasury securities.

and other organizations involved in Treasury market infrastructure. (Box 4 identifies the membership in October 2008.) The TMPG routinely meets about eight to ten times a year to discuss trading issues and best-practice recommendations for the Treasury market and publishes “Treasury Market Best Practices,”⁵⁶ a “living document” that aims to support

⁵⁵ Federal Reserve Bank of New York, “Statement on Formation of Private-Sector Treasury Market Best Practices Group,” February 9, 2007, available at <http://www.newyorkfed.org/newsevents/news/markets/2007/an070209.html>. See also Federal Reserve Bank of New York, “Statement Regarding New York Fed Meeting with Primary Dealers,” November 6, 2006, available at <http://www.newyorkfed.org/newsevents/news-archive/markets/2006/an061105.html>.

⁵⁶ Available at http://www.newyorkfed.org/tmpg/TMPG-best-practices_033109.pdf.

Box 4

Membership of the Treasury Market Practices Group in October 2008

Thomas Wipf, <i>Chair</i>	Morgan Stanley
Fran Bermanzohn	Goldman Sachs (last meeting in October 2008)
Arthur Certosimo	The Bank of New York Mellon
Daniel Dufresne	Citadel Investment Group, LLC
Peter Economou	State Street
John Fath	BTG
Michael Haddad	Caxton Associates (last meeting in January 2009)
Curt Hollingsworth	Fidelity Investments
James Hraska	Barclays Capital
Murray Pozmanter	Depository Trust & Clearing Corporation
Gerald Pucci	BlackRock
John Roberts	Barclays Capital
Bill Santangelo	Countrywide Securities Corp. (last meeting in October 2008)
Peter Stebbing	Reserve Bank of Australia
Nancy Sullivan	The Bank of New York Mellon
Matthew Zames	JPMorgan Chase

Subsequent Additions prior to May 1, 2009

Glenn Hadden	Goldman Sachs
Stuart Wexler	Merrill Lynch

Treasury market integrity and efficiency. Best-practice recommendations include guidelines for promoting market liquidity, for integrating compliance and trading functions in a meaningful fashion, and for managing large positions in ways that avoid adverse consequences for market liquidity. TMPG practice guidance has also addressed the efficient clearing and settlement of trades. Thus, the TMPG was well positioned in October 2008 to provide the leadership required to revise the market convention for settlement fails.⁵⁷

The first meeting of the TMPG after the reopening auctions of October 8 and 9 was on Thursday, October 23. The chairman, Tom Wipf of Morgan Stanley, opened the meeting by reminding members of the urgency of the situation:

To overstate the obvious, the work of today's meeting around settlement fails in Treasuries finds our committee

⁵⁷ The Association of Primary Dealers provided similar leadership in revising the market convention for the treatment of accrued interest in repurchase agreements after the 1982 failure of Drysdale Government Securities (Garbade 2006).

at a crossroad. . . . At this critical juncture it is incumbent that TMPG take the leadership position on this issue and work as a group to provide practical, real time solutions. . . . Our goal as members of this committee is to support the integrity and efficiency of the U.S. Government Treasury Market. . . .

William Dudley, Executive Vice President of the Federal Reserve Bank of New York and Manager of the Fed's System Open Market Account, echoed Wipf's call for leadership: "This [meeting] is happening at a critical time in the market place where leadership is important to creating confidence and stability—we believe this group can, should and will provide that leadership."

7.1 The November 12 Recommendations

During the October 23 meeting, and in a series of subsequent telephone conference calls, TMPG members discussed changes in market practices that might reduce chronic fails and limit the likelihood of a recurrence. The group unveiled its recommendations on Wednesday, November 12, 2008.⁵⁸

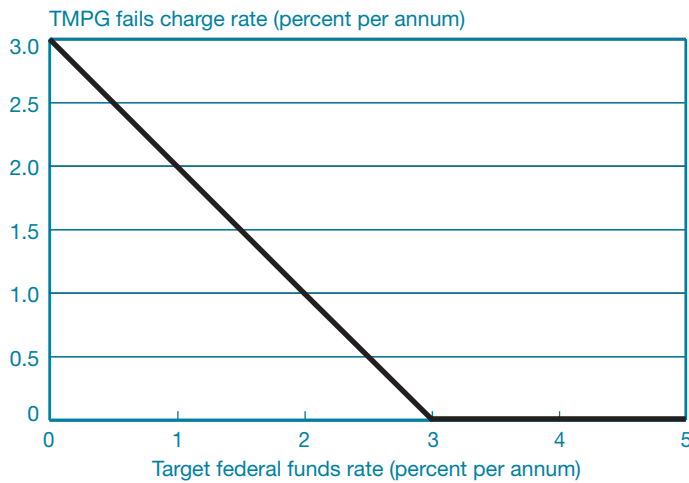
The principal recommendation suggested that "market participants agree that the invoice price . . . on any cash or financing transaction that fails to settle on the originally scheduled date be reduced at a fails [charge] rate equal to the greater of a) 3 percent per annum minus the fed funds target rate . . . and b) zero." As shown in Chart 4, this would penalize fails at a rate that starts at zero when the target federal funds rate is at or above 3 percent and rises to 3 percent as the target funds rate declines toward zero. It follows that the economic cost of failing would never fall below about 3 percent per annum.⁵⁹ The TMPG concluded that the "out-of-pocket cost to the party failing to deliver securities will provide a compelling incentive to resolve fails promptly."

⁵⁸ Treasury Market Practices Group, "Treasury Market Practices Group Endorses Several Measures to Address Widespread Settlement Fails," November 12, 2008, available at <http://www.newyorkfed.org/tmpg/PR081112.pdf>. The recommendations were reported in "Treasury's Warning Adds to Plunge in Failed Trades," Bloomberg.com, November 12, 2008, 15:59 EST, and "Repo Experts Propose Plans to Counteract Rise in 'Fails,'" FT.com, November 12, 2008, 20:00.

⁵⁹ This follows because the sum of the target federal funds rate, which is usually at or slightly above the Treasury general collateral repo rate, and the fails charge rate would never be less than 3 percent. The TMPG could have referenced the overnight Treasury general collateral repo rate in lieu of the target federal funds rate, but the target funds rate is more familiar and more readily observable to market participants. There is no definitive and widely disseminated measure of overnight Treasury general collateral repo rates. The Federal Reserve, by comparison, publicly announces the target funds rate.

CHART 4

TMPG Fails Charge Rate as a Function of Target Federal Funds Rate



The TMPG explicitly based its recommendation on the dysfunctionality of the existing market convention for settlement fails:

Past experience—for example, during the summer of 2003—shows that settlement fails in a particular [security] may become widespread and persistent when the special collateral repo rate for that [security] nears zero. Special collateral repo rates cannot exceed the Treasury general collateral repo rate. As a result, settlement fails across a wide variety of [securities] can . . . become widespread and persistent when the Treasury general collateral repo rate is near zero—as is currently the case.

The underlying problem is the Treasury market contracting convention that a seller can deliver securities after the originally scheduled settlement date at an unchanged invoice price [and] without incurring any penalty. Introduction of a dynamic fails [charge] with a finite cap rate would remedy this problem. In particular, a dynamic fails [charge] would provide an incentive for sellers to resolve fails promptly, and could lead to repo contracting conventions [that is, negative repo rates] that would give beneficial owners of Treasury securities an opportunity to earn as much as the [3 percent] cap rate in securities loan fee income regardless of the level of nominal interest rates.⁶⁰

⁶⁰ Treasury Market Practices Group, “Treasury Market Practices Group Endorses Several Measures to Address Widespread Settlement Fails,” November 12, 2008.

The TMPG recognized that the “the introduction of [the recommended convention] raises operational, legal and other implementation issues that may vary across Treasury market participants” and promised to engage in “further analysis of these issues,” with a goal of announcing by January 5, 2009, its recommendations for implementation.⁶¹

8. THE CRISIS RECEDES BUT SUPPORT FOR REVISING THE MARKET CONVENTION PERSISTS

By the time the TMPG made its November 12 recommendation, settlement fails in the Treasury market were receding rapidly. As shown in Chart 5, primary dealer fails declined from a daily average of \$379 billion during the week of October 16-22 to a daily average of \$70 billion during the week of November 13-19 and averaged less than \$50 billion a day in December.

Support for a revised market convention for settlement fails persisted in spite of the receding volume of fails, largely because the crisis of late September and early October had given added currency to the view that the existing convention was dysfunctional. The discussion of settlement fails during the November 4, 2008, meeting of the Treasury Borrowing Advisory Committee, as well as the views expressed in a prominent market newsletter in early January 2009, illustrates the growing consensus.⁶²

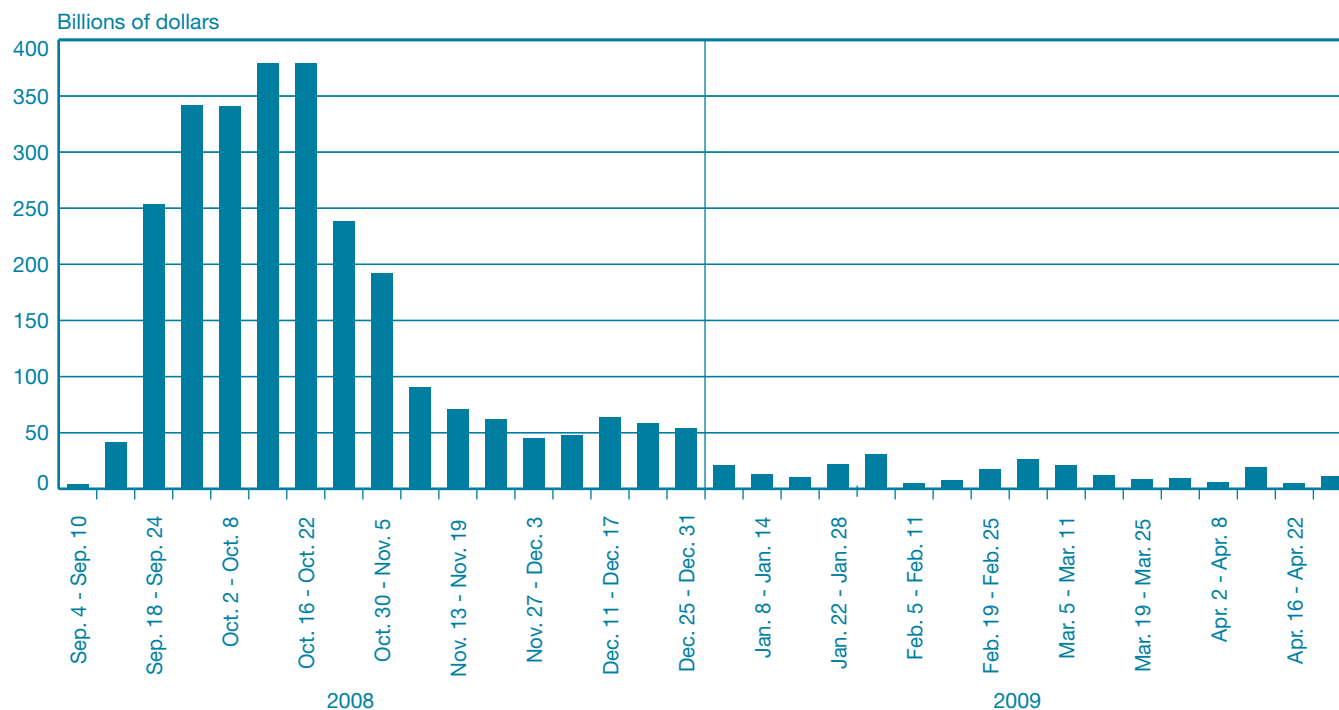
⁶¹ The TMPG made three additional recommendations on November 12: 1) that market participants undertake a study of the most efficient way to margin fails in Treasury securities (in order to reduce counterparty credit risk exposure), 2) that market participants examine whether the Fixed Income Clearing Corporation, the two clearing banks, or other interested parties might develop “new or enhanced . . . multilateral netting arrangements” that might reduce settlement fails, and 3) that market participants pursue consensual cash settlement of transactions in Treasury securities that have been failing for more than five days. The TMPG also expressed its support for “discussion of a standing facility by the U.S. Department of the Treasury to provide temporary new supply of specific securities at a penalty rate when settlement fails persist,” but noted that the creation of such a facility was a long-term goal and that progress on a fails charge should not be contingent on the development of a Treasury security lending facility.

⁶² William Dudley, Executive Vice President, Federal Reserve Bank of New York, and Manager of the System Open Market Account, stated during a public conference call on January 14, 2009, on the TMPG fails initiative that: “Although settlement fails have declined recently from record levels amid reduced trading volumes, the extremely low level of interest rates suggests that fails could again rise significantly when trading activity picks up. The fundamental incentive to deliver securities under current market conditions is simply not sufficient at very low nominal interest rates to reduce the probability of large chronic fails to acceptable levels.”

CHART 5

Daily Average (Over Weekly Intervals) Primary Dealer Settlement Fails in Treasury Securities

September 2008 to April 2009



Source: Federal Reserve Bank of New York.

8.1 The November Meeting of the Treasury Borrowing Advisory Committee

The Treasury Borrowing Advisory Committee (TBAC) is a committee of market professionals selected to advise the Secretary of the Treasury on matters relating to Treasury debt management. At its November 4 meeting, the committee discussed the upcoming midquarter refunding and, *inter alia*, the fails situation.

The TBAC's discussion of settlement fails focused initially on better ways for the Treasury to reopen outstanding issues than the "snap" reopenings of October 8 and 9, but then turned to the market convention for settlement fails. Several committee members observed that investors had "little economic incentive to lend securities when general collateral [repo] rates stood at 20 basis points," and one member suggested that "a negative [repo] rate of 200 or 300 basis points . . . would create the correct economic incentives to cause holders of securities in low interest rate environments to lend securities again."⁶³

In its ensuing report to the Secretary of the Treasury, the TBAC expressed the view that the low level of short-term interest rates "has made the cost of failing negligible, [leaving] little desire for short-sellers to close out their positions" and noted the suggestion of one committee member "that there should be a cost in the form of a penalty rate associated with fails in a low-rate environment." The report further noted that such a cost would encourage negative-rate repo trading, "which would allow the free market to determine the effective cost of the fail, and change the economics of securities lending."⁶⁴

⁶³ U.S. Department of the Treasury, "Minutes of the Meeting of the Treasury Borrowing Advisory Committee of the Securities Industry and Financial Markets Association, November 4, 2008," November 5, 2008, available at <http://www.ustreas.gov/press/releases/hp1239.htm>.

⁶⁴ U.S. Department of the Treasury, "Report to the Secretary of the Treasury from the Treasury Borrowing Advisory Committee of the Securities Industry and Financial Markets Association, November 4, 2008," November 5, 2008, available at <http://www.ustreas.gov/press/releases/hp1238.htm>.

8.2 Comments in Wrightson's *Money Market Observer*

The January 5, 2009, edition of Wrightson's *Money Market Observer* devoted substantial space to the TMPG proposal to revise the market convention for settlement fails. The newsletter noted that creating an explicit charge for settlement fails was "the most straight-forward way to remedy the obvious structural flaws that lead to delivery logjams in today's market," and pointed out the anticipated benefits of restoring competitive market forces to the special collateral repo markets: "The TMPG believes (correctly, in our view) that the repo market will be more elastic—and the Treasury clearing process more efficient—if the floor on special repo rates is set low enough [that is, below zero] to preserve a spread relative to general collateral rates even in the current rate environment."

9. GETTING IT RIGHT

Although a consensus had emerged in support of revising the market convention for settlement fails, the TMPG recommendation for reducing invoice prices itself needed some revision.

The TMPG recommendation would have required a seller and a buyer to reduce the invoice price on a failing transaction by *matching amounts* on a *daily* basis. If one party reduced the

Although a consensus had emerged in support of revising the market convention for settlement fails, the TMPG recommendation for reducing invoice prices itself needed some revision.

invoice price and the other did not, or if the two parties reduced the invoice price by different amounts, any attempt by the seller to deliver securities against payment would be rejected by the buyer (because the buyer would be looking to pay a different amount than what the seller was looking to receive). TMPG members who understood the complex architecture of broker-dealer and custodian settlement systems pointed out that requiring matching daily price reductions would impose a major operational burden on market participants and could lead to an explosion in rejected deliveries (and thus in settlement fails).

In lieu of adjusting invoice prices, several TMPG members suggested that an economically equivalent result could be obtained if a seller who makes a late delivery agrees to make a *side payment* to the buyer in an amount equal to what became known as the "TMPG fails charge." The charge for a fail on a given business day would be computed as:

$$(1) \quad C = \frac{n}{360} \times .01 \times \max[3 - R_{trgt}, 0] \times P,$$

where:

C = charge, in dollars,

n = number of calendar days to the next following business day,

R_{trgt} = target federal funds rate at the close of business on the business day preceding the fail, in percent per annum, and

P = total proceeds due from the buyer, in dollars.

For example, if $P = \$10$ million, $R_{trgt} = 1$ percent, and $n =$ three days, then $C = \$1,666.66$.⁶⁵ This procedure had the advantage of not requiring any change in existing settlement systems.

The idea of replacing invoice price adjustments with side payments illustrates an important aspect of the TMPG initiative: by working collaboratively, the TMPG was able to achieve its objectives while accommodating an existing institutional structure: back-office settlement systems. The difference between a price adjustment and a side payment may seem trivial, but the success of the TMPG initiative hinged on recognizing the difference.

9.1 The January 5 Announcement

On January 5, 2009, the TMPG announced that it was recommending a fails charge in the form of a side payment on transactions that failed to settle on a timely basis and that it was making several additional refinements to its November 12 recommendation.⁶⁶ The three key refinements

⁶⁵ $\$1,666.66 = (3/360) \times .01 \times \max[3 - 1, 0] \times \$10,000,000$.

⁶⁶ Treasury Market Practices Group, "Timeline for New Market Practices to Address Widespread Settlement Fails in U.S. Treasury Securities," January 5, 2009, available at <http://www.newyorkfed.org/tmpg/PR090105c.pdf>, and Treasury Market Practices Group, "Claiming a Fails Charge for a Settlement Fail in U.S. Treasury Securities," January 5, 2009, available at <http://www.newyorkfed.org/tmpg/PR090105a.pdf>. The January 5 announcement was reported in "Repo Arena Gets a Plan on Penalties," *Wall Street Journal*, January 6, 2009, p. C3, and "Penalty for Failed Trades Set to Spark New Era for US Repo," *Financial Times*, January 7, 2009, p. 22.

were 1) a statement of the process for claiming a fails charge, 2) a timeline suggesting that market participants begin claiming for settlement fails on transactions agreed to on or after May 1, 2009, and 3) replacement of the target federal funds rate (in the formula for the fails charge, equation 1 above) with a “TMPG reference rate.” The latter rate was defined as the target federal funds rate if the Federal Open Market Committee specified a target rate or the lower limit of the target band for the federal funds rate if the FOMC specified a target band.⁶⁷ In the event the FOMC specified neither a target rate nor a target band, the

On January 5, 2009, the TMPG announced that it was recommending a fails charge in the form of a side payment on transactions that failed to settle on a timely basis and that it was making several additional refinements to its November 12 recommendation.

TMPG committed to recommending some other similar, readily observable, short-term interest rate as a reference rate for the fails charge formula.⁶⁸

The decision to recommend a side payment (in lieu of an invoice price adjustment) required the TMPG to specify a way for buyers to collect from sellers who failed to deliver securities on a timely basis. In the case of buyers and sellers who settled through FICC, a collection process could be added to other similar processes previously implemented by FICC (such as the collections and disbursements that result from marking transactions to current market prices).⁶⁹ However, the collection process was not as simple for transactions that settled bilaterally, as was the case for most transactions between dealers and their nondealer customers.

⁶⁷ This charge was necessitated by the December 16, 2008, decision of the Federal Open Market Committee to establish a target range for the federal funds rate of 0 to 1/4 percent.

⁶⁸ In late March 2009, the TMPG announced a slightly different form for the fails charge computation:

$$C = \frac{1}{360} \times .01 \times \max[3 - R_{TMPG}, 0] \times P.$$

In this form, the charge is computed for each *calendar* day that a seller’s delivery obligation is failing. R_{TMPG} is the TMPG reference rate on the business day preceding the day for which the charge is computed. See Treasury Market Practices Group, “Treasury Market Practices Group Announces Updates to Fails Charge Recommendation,” March 30, 2009, available at http://www.newyorkfed.org/tmpg/tmpg_033009.pdf.

The January 5 announcement suggested that the best way to initiate the fails charge would be for buyers to tender claims directly to sellers.⁷⁰ A seller could either pay what was claimed or dispute the claim and negotiate with its counterparty over the amount due.

The TMPG further suggested that if an investor employed a professional asset manager and that manager contracted to sell securities that were not delivered on a timely basis, the claim for the fails charge should be directed to the asset manager (rather than to the investor or to the investor’s custodian). This suggestion was based on the pragmatic notion that since the sale had been negotiated by the asset manager, the asset manager would be in the best position to recognize the sale and identify who was responsible for the settlement fail, be it the asset manager, the investor’s custodian, or some other party,⁷¹ or whether the claim should be left for the account of the investor.⁷²

9.2 Trading Practice and Market Practice Recommendations

Following the January 5 announcement, TMPG members and other market participants collaborated to publish two documents providing guidance on how to implement the TMPG fails charge. The documents were important for clarifying how fails charges should be calculated and claimed and generally for enhancing the transparency of the new market convention.

⁶⁹ The addition required a change in FICC rules that had to be approved by the Securities and Exchange Commission. FICC filed the proposed rule change on February 25, 2009 (Securities and Exchange Commission Release no. 34-59569, March 12, 2009), and the Commission granted approval two months later (Securities and Exchange Commission Release no. 34-59802, April 20, 2009).

⁷⁰ The January 5 announcement noted the possibility of setting up a central industry utility to receive and process claims, but observed that the design of such a facility raised novel questions regarding the identification of buyers and sellers and would require further consultation with market participants.

⁷¹ Some investors retain an agent to lend securities from the investor’s portfolio. Such agents are commonly called “agent sec lenders.” In most cases, an agent sec lender is obliged to reclaim securities out on loan if the investor’s asset manager decides to sell the securities. If an agent sec lender fails to reclaim securities on a timely basis and thereby causes a settlement fail, the fail may be the responsibility of the agent sec lender, rather than the asset manager or the custodian.

⁷² A sale of securities negotiated by an asset manager may fail to settle on a timely basis because the investor’s custodian failed to receive the same securities on an unrelated purchase. Such fails cannot be attributed to faulty behavior by the asset manager or the investor’s custodian, so the resulting fails charge would be left for the account of the investor. The investor can, of course, direct its asset manager to file a claim on the seller who failed to deliver securities to the investor.

Trading practice recommendations: On January 15, 2009, the TMPG and the Securities Industry and Financial Markets Association (SIFMA) published a “U.S. Treasury Securities Fails Charge Trading Practice”⁷³ to give market participants

TMPG members and other market participants collaborated to publish two documents providing guidance on how to implement the TMPG fails charge. The documents were important for clarifying how fails charges should be calculated and claimed and generally for enhancing the transparency of the new market convention.

guidance on exactly the types of transactions that were covered by, and excluded from, the TMPG fails charge. The “Trading Practice” also recommended the form of a letter that a market participant could send to counterparties, advising them of the participant’s adoption of the new policy for settlement fails, and suggested a statement that could be added to trade confirmations indicating that a transaction was subject to the fails charge.

Market practice recommendations: On April 23, 2009, SIFMA published a “Treasury Market Practices Group Fails Charge Market Practice”⁷⁴ that recommended procedures for buy-side firms to use in connection with the new fails charge. The recommended procedures included processes for researching and tracking fails, calculating fails charges, determining responsibility for a claim, sending and receiving claims, and accounting for claims. The procedures also included suggestions made earlier by SIFMA and adopted by the TMPG⁷⁵ that claims be submitted at the beginning of a month for fails settled during the preceding month (to accommodate custodians and asset managers who structured their control

⁷³ Treasury Market Practices Group and Securities Industry and Financial Markets Association, “U.S. Treasury Securities Fails Charge Trading Practice,” January 15, 2009, available at http://www.sifma.org/capital_markets/docs/Fails-Charge-Trading-Practice.pdf.

⁷⁴ Securities Industry and Financial Markets Association, “Treasury Market Practices Group Fails Charge Market Practice,” April 23, 2009, available at http://www.theassetmanager.com/docs/AM_Custodian_IndustryProcedures_TMPG_FailsCharge.pdf.

⁷⁵ See Treasury Market Practices Group, “Treasury Market Practices Group Announces Updates to Fails Charge Recommendation,” March 30, 2009, available at http://www.newyorkfed.org/tmpg/tmpg_033009.pdf.

systems around settled transactions) and be in excess of \$500 per issue per settlement (to limit costly research and billing efforts to nontrivial claims).

10. IMPLEMENTATION

The TMPG fails charge went into effect on May 1, 2009, replacing the former market convention of postponing—without any explicit penalty and at an unchanged invoice price—a seller’s obligation to deliver Treasury securities when the seller fails to deliver the securities on a scheduled settlement date. Henceforth, the cost of failing to settle a sale of Treasury securities in a timely fashion would not be less than 3 percent per annum.

It would be premature to argue that the TMPG fails charge has eliminated the possibility of yet another episode of chronic settlement fails in Treasury securities; past episodes were rare to begin with and some future event may demonstrate the existence of an unsuspected flaw in the new system. It may also be the case that the 3 percent benchmark rate is too low and that chronic fails would be better mitigated with a 3 1/2 or 4 percent rate. However, there is no evidence to date that the

The new convention is not yet out of its infancy, but there is reason to anticipate that the TMPG fails charge will . . . dampen future eruptions [of settlement fails].

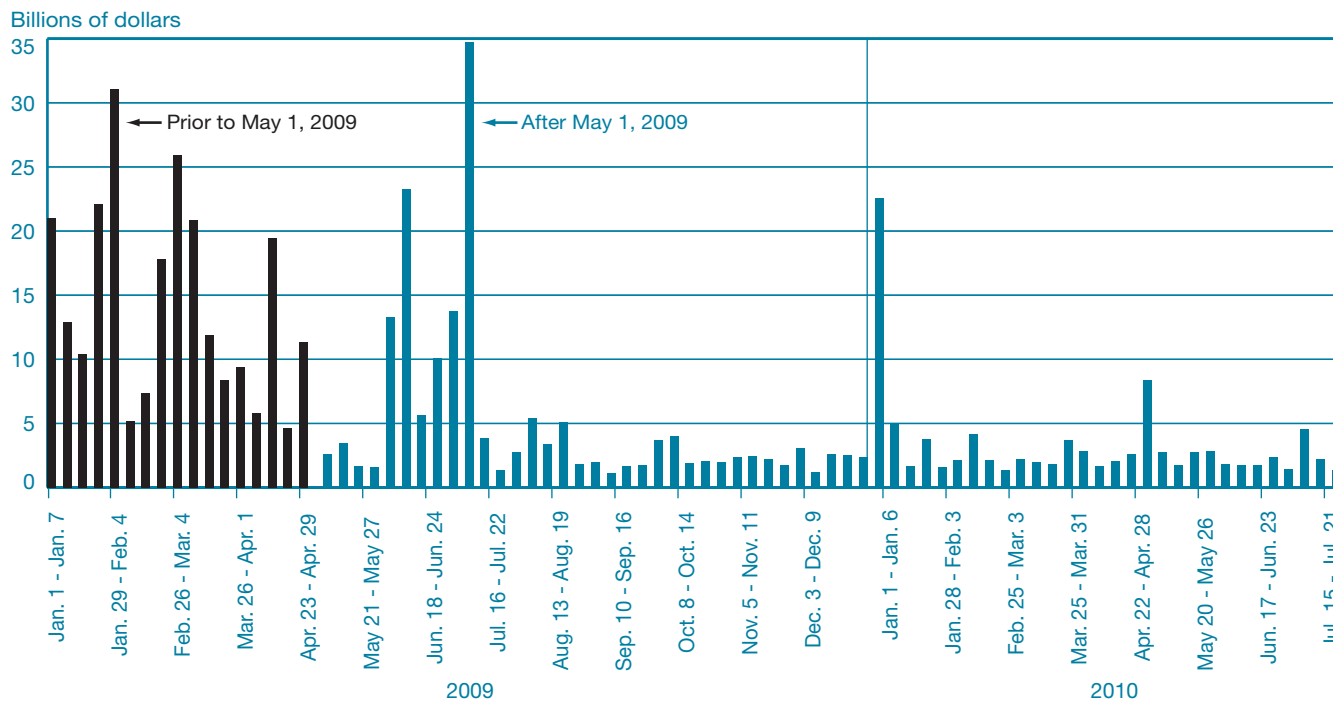
new market convention, and the 3 percent benchmark rate, are not working. Chart 6 shows daily average settlement fails over weekly intervals from the beginning of 2009 to July 2010. Fails averaged a bit over \$14.4 billion per day during the first four months of 2009, but only \$4.2 billion per day since implementation of the fails charge.⁷⁶ More important, the relatively modest eruptions of settlement fails that appeared during the first week of July 2009 and the first week of January 2010 quickly subsided. The new convention is not yet out of its infancy, but there is reason to anticipate that the TMPG fails charge will similarly dampen future eruptions.

⁷⁶ The fails charge was never intended to eliminate *all* settlement fails. (Fails attributable to miscommunication or operational problems are unlikely to be eliminated by the fails charge—although they may be resolved more quickly.) Rather, the fails charge was aimed at mitigating episodes of *chronic* fails that can threaten market liquidity and efficiency.

CHART 6

Daily Average (Over Weekly Intervals) Primary Dealer Settlement Fails in Treasury Securities

January 2009 to July 2010



Source: Federal Reserve Bank of New York.

11. CONCLUSION

The TMPG fails charge initiative is important both for what it accomplished and for how it was accomplished. Substantively, the initiative revised an outmoded convention and mitigated an important dysfunctionality in a market of critical national significance. Procedurally, the initiative demonstrated how cooperation between the public and private sectors can speed innovative and efficient responses to changing circumstances. At the time of the May 1, 2009, implementation of the fails charge, the Federal Reserve Bank of New York welcomed the new convention:

We applaud the dedicated efforts of the TMPG in spearheading the development and implementation of this targeted solution to the settlement fails problem. This significant milestone in the evolution of Treasury market practice demonstrates that groups, such as the TMPG, are effective in addressing deficiencies in market functioning and facilitating market best practices.⁷⁷

In a subsequent letter to the TMPG membership expressing his personal thanks for the Group's dedication and commitment to making the fails charge a reality, William Dudley, now president of the Federal Reserve Bank of New York, reflected on the significance of the new market convention:

The implementation of the fails charge marks a rare and significant evolution in Treasury market architecture. In my view, one would need to look back to 1982 to find a development of similar magnitude, when the collapse of Drysdale Securities led to the adoption of a new market practice to include accrued interest in repo contracts. The fails charge stands among relatively few revisions to contracting conventions in the Treasury market since the development of a liquid national market following World War I.

⁷⁷ Federal Reserve Bank of New York, "New York Fed Applauds Implementation of the TMPG's Fails Charge Recommendation," May 1, 2009, available at <http://www.newyorkfed.org/newsevents/news/markets/2009/ma090501.html>.

APPENDIX: ADDITIONAL INDIVIDUALS WHO PROVIDED FEEDBACK AND ASSISTANCE IN THE IMPLEMENTATION PHASE OF THE TMPG FAILS CHARGE INITIATIVE

The following list attempts to include all non-TMPG (Treasury Market Practices Group) individuals who either served on formal subgroups that contributed to the timely implementation of the TMPG fails charge or participated in less formal conference calls and meetings. The authors apologize for any inadvertent omissions.

David Aman	Cleary Gottlieb Steen & Hamilton LLP
Marc Baum	Ramius LLC
Brandon Becker	WilmerHale
Brent Blake	State Street
Gary Buki	The Bank of New York Mellon
Kevin Caffrey	The Bank of New York Mellon
Maria Carina	Euroclear
Michael Cetta	AllianceBernstein Holdings
Brayton Cherry	Brown Brothers Harriman & Co.
Ed Corral	JPMorgan Chase
David Cosgrove	ICAP
Brian Crowe	Fidelity Investments
Craig Delany	JPMorgan Chase
Laura Dietel	State Street
Craig Dudsak	Citigroup
Steve Dunn	JPMorgan Chase
Joe Finan	Morgan Stanley & Co.
Marcellus Fisher	PIMCO
Barbara Friedman	New York Life Investment Management LLC
Robert Good	Goldman, Sachs & Co.
Simon Griffiths	JPMorgan Chase
Olivier Grimonpont	Euroclear
Chris Haas	Merrill Lynch
Janice Hamilton	The Northern Trust Company
Robert Hennessy	The Bank of New York Mellon
Eugene Ing	Depository Trust & Clearing Corporation
Dyann Kiessling	Fidelity Investments
Bradley Koehler	Euroclear
Marty Kruse	BNY Mellon Asset Servicing
Michael Landolfi	State Street
Lourdes Leon	Morgan Stanley & Co.
Christine Lin	Citigroup
Fred Lipinski	Depository Trust & Clearing Corporation
Colin Lloyd	Cleary Gottlieb Steen & Hamilton LLP
Frank Lupica	Lord, Abbett & Co. LLC
Diane Madera	Morgan Stanley & Co.
Claudia Maia	Euroclear
Jennifer Manor	Fidelity Investments
Frank Martino	New York Life Investment Management LLC
Christopher Marzullo	Lord, Abbett & Co. LLC
Jason McCann	Reserve Bank of Australia
Shirley McCoy	JPMorgan Chase
Katherine McGaugh	State Street
Kevin Meagher	Fidelity Investments
Omar Medina	Goldman Sachs Asset Management

APPENDIX: ADDITIONAL INDIVIDUALS WHO PROVIDED FEEDBACK AND ASSISTANCE
IN THE IMPLEMENTATION PHASE OF THE TMPG FAILS CHARGE INITIATIVE (CONTINUED)

Fatima Mehladi	Euroclear
Eric Miller	Citadel Solutions, LLC
Tamara Molinary	AllianceBernstein Holdings
Carolyn Monroe-Koatz	JPMorgan Chase
Penny Morgan	Western Asset Management
Louis Nazarro	JPMorgan Chase
Edward Neeck	JPMorgan Chase
Peter Novello	Lord, Abnett & Co. LLC
Elisa Nuottajarvi	SIFMA
Paul Parseghian	Prudential Investment Management Inc.
Judith Polzer	JPMorgan Chase
Joseph Pomo	Goldman Sachs Asset Management
Thomas Ponti	State Street
Nancy Prior	Fidelity Investments
Pawan Puneet	State Street IMS
Christopher Ramsay	Citadel Investment Group, LLC
Bill Rose	BTG
Theodore Rothschild	JPMorgan Chase
Timothy Ryan	SIFMA
Joseph Sack	SIFMA
Randy Snook	SIFMA
Guido Stroemer	UBS
Brian Swann	Goldman Sachs
Rob Toomey	SIFMA
Diane Trupia	SIFMA
Raymond Tyrrell	Brown Brothers Harriman & Co.
Jason Ward	Fidelity Investments
Andrew Waskow	Goldman Sachs
Mark Willis	Merrill Lynch
Patricia Yak	Credit Suisse First Boston
Lawrence Young	Credit Suisse First Boston
Anthony Zook	JPMorgan Chase

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