



Understanding Settlement Fails in Agency Mortgage-Backed Securities

April 29, 2011

1. Introduction

Trades of agency mortgage-backed securities (MBS) have failed to settle on the date agreed upon by the buyer and seller at high levels over the past year (see chart). Primary dealers reported average daily fails to deliver of agency MBS of \$83.3 billion between December 31, 2009 and December 29, 2010 and average daily fails to receive of \$73.8 billion over the same period, versus average daily fails to deliver and receive of \$12.4 billion and \$11.6 billion, respectively, over the preceding five years.¹ An earlier episode of protracted fails at a high level occurred in 2003.²

Such settlement fails are important not only to the counterparties of a failed trade, but to market participants generally. To the counterparties of a trade, fails can increase operational costs and counterparty credit risk, absorb scarce capital through regulatory charges, and damage customer relations. More generally, however, the prospect of persistent settlement fails at a high level can cause market participants to temporarily withdraw from the market, or even exit the market, adversely affecting market liquidity and stability.

Given its mission of supporting the integrity and efficiency of the Treasury, agency debt, and agency MBS markets, the Treasury Market Practices Group (TMPG)³ has an interest in promoting practices that would reduce settlement fails in these markets. The TMPG believes that the risks of settlement fails to the agency MBS market in particular, as

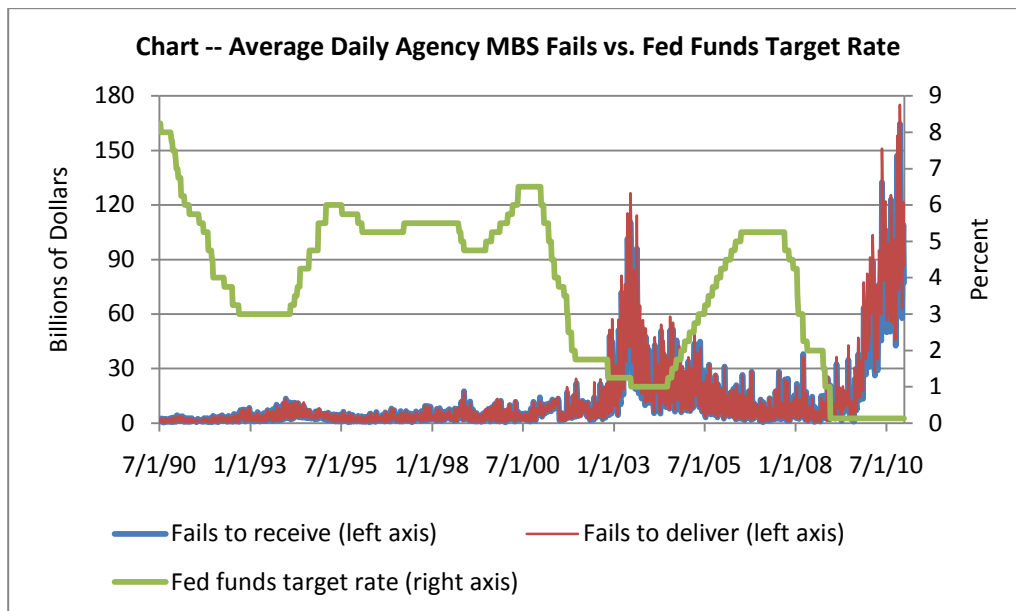
¹ Primary dealer fails hit an all-time high in the week ending November 17, 2010, with average daily fails to deliver and receive of \$175.1 billion and \$164.7 billion, respectively.

² In 2003, average daily fails to deliver peaked at \$126.6 billion in the week ending June 18, a record for the time, and averaged \$44.6 billion over the year (see Box 1 for a description of the data reported here).

³ The TMPG is comprised of senior business managers and legal and compliance professionals from a variety of institutions, including securities dealers, banks, buy-side firms, and market utilities, and is sponsored by the Federal Reserve Bank of New York. The TMPG meets periodically to discuss trading issues and promote best practices in the Treasury, agency debt, and agency MBS markets. For more on the TMPG, including sitting TMPG members, see <<http://newyorkfed.org/tmpg>>.

noted above and discussed in greater detail below, imperil the smooth and efficient market functioning for which the group strives.

As such, the TMPG⁴ describes in this paper why fails arise in agency MBS, the consequences of a fail, and how fails can be avoided.⁵ It argues that while the impetus for any particular episode of fails varies somewhat, the absence of an explicit cost of failing, especially in a low interest rate environment, is a key condition for protracted instances of high levels of fails. That is, there is often little or no incentive to avoid failing in a low interest rate environment given current market conventions. The paper further explains how fails impose costs on market participants involved in – and not involved in – a failing trade. The paper then reviews the recent initiative to address fails in the U.S. Treasury securities market before concluding.



Source: Authors' calculations, based on data from the Federal Reserve Bank of New York.

⁴ The TMPG thanks Michael Fleming, Vice President, Capital Markets, Federal Reserve Bank of New York, for his substantial contributions to this paper.

⁵ This paper does not discuss settlement fails in non-agency (private label) MBS. Agency MBS account for the vast majority of MBS outstanding and virtually all MBS issuance in recent years. The discussion here is not fully pertinent to fails in non-agency MBS, because such securities have different trading conventions.

2. The TBA Market and Agency MBS Settlement

Trading in the agency MBS market generally occurs on a “to be announced,” or TBA, basis.⁶ The TBA market is a forward-delivery market in which participants agree to transact agency MBS in a contract that specifies the issuer, maturity, and coupon, but not the specific securities, or pools of mortgages, to be delivered. At settlement, the seller has the option to deliver any of a variety of MBS pools that meet the agreed upon characteristics.

The TBA convention of only specifying certain characteristics of the securities at the time of a trade allows trading of many heterogeneous MBS pools to concentrate in a few liquid contracts. At the same time, certain characteristics of the MBS pools not specified at the time of a trade (such as past prepayment rates or geographic distribution) also affect security value, so that some deliverable bonds are more valuable than others, bifurcating eligible bonds into “cheapest-to-deliver” pools and “pay-up” pools. Sellers naturally seek out the cheapest-to-deliver pools to fulfill their delivery obligations.

TBA trades have set monthly settlement dates, announced by the Securities Industry and Financial Markets Association (SIFMA), upon which the vast majority of MBS settle. Though they can be traded as much as three or more months in advance of settlement, TBA trades are frequently scheduled to settle at the next scheduled settlement date (up to one month forward). Two business days before settlement, on the pool notification date, the seller communicates to the buyer the identities of the MBS pools it intends to deliver on settlement day. On settlement day, the seller delivers those pools and receives the price agreed to on the trade date.

The forward settlement nature of the TBA market enables mortgage lenders to sell securities forward based on their expected originations of mortgages. That is, they can sell MBS for forward delivery when a potential borrower locks in a rate, thereby hedging their interest rate exposure, and then remove the hedge when the mortgage is sold in the secondary market. Some potential borrowers do not end up closing, however, creating

⁶ Vickery and Wright (2010) describe TBA trading and how it promotes liquidity in the agency MBS market. The discussion here draws on that article.

“pipeline fallout.” More generally, because of pipeline fallout, refinancing uncertainty, and other factors, there is considerable uncertainty about the ultimate supply of securities that will be created and delivered into the TBA market.

While most agency MBS trades occur in the TBA market, a small proportion of trades occurs on a specified pool basis, whereby the particular pool to be delivered is agreed to at the time of a trade. Such trades can settle as soon as the same day, but typically settle on a single settlement day a month, like TBA trades. Our discussion focuses on the TBA market because it accounts for the vast majority of both trading and settlement fails and because the nature of TBA trading is distinct from that found in other markets.

3. Settlement Fails

Why Settlement Fails Occur

Settlement fails of agency MBS occur for a variety of reasons.⁷ Miscommunication is one source of fails. A buyer and seller may not identify to their respective operations departments the same details for a given trade. On the pool notification date the seller may notify the buyer of the MBS pools it intends to deliver, which it believes meet the parameters of the trade, but the buyer may reject the notification if it has a different understanding of the trade. If the rejection occurs late in the day there may not be enough time for the parties to resolve the misunderstanding and settlement will need to be postponed. Miscommunication occurs regularly on a small scale and helps explain why fails never fall to zero.

In other cases, operational problems may lead to the failure of a seller or a seller’s custodian to deliver securities or to provide proper notification. An extreme example occurred on September 11, 2001, when the destruction of broker offices and records and impaired telecommunication links led to massive settlement problems. In the week

⁷ Much of the discussion here parallels an analogous discussion of Treasury security settlement fails in Fleming and Garbade (2005).



following September 11, fails to deliver by primary dealers reached a record high for the time, averaging \$19.8 billion a day.

More commonly, a seller may be unable to deliver securities because of a failure to receive the same securities in settlement of an unrelated purchase on a timely basis. This can lead to a “daisy chain” of cumulatively additive fails: A’s failure to deliver bonds to B causes B to fail on a delivery of the same bonds to C, causing C to fail on a similar delivery to D, and so on. A daisy chain becomes a “round robin” if the last participant in the chain is itself failing to the first participant.⁸

“Pool sorting” is a common cause of daisy chain fails in the TBA market and, like miscommunication, helps explain why agency MBS fails never fall to zero.⁹ On pool notification date, market participants with purchase and sale obligations will both receive and send notifications of the specific pools that will be delivered to meet delivery obligations. Traders analyze the incoming pools to sort for the most valuable pools to retain in inventory. This pool sorting creates an incentive for market participants to wait as long as possible to provide notification to buyers, but delaying notification to the last minute can lead to fails as other participants with offsetting obligations have insufficient time to provide notification to their counterparties.

A final reason for fails – and the one best able to explain persistent fails – is that a market participant may be “short” the TBA and have insufficient incentive to borrow securities to make delivery (or to deliver more valuable securities than the cheapest-to-deliver). As will be explained later, insufficient incentive to avoid failing helps explain the high level of agency MBS fails in 2003 and 2010. To understand why the incentive to avoid failing is sometimes insufficient, one first needs to understand what happens when a fail occurs.

⁸ Cleaning up round robin fails can be operationally intensive because agency MBS trades clear across a number of settlement and payment systems and not via a central utility.

⁹ Fails to deliver and fails to receive have occurred in every week for which there is primary dealer fails data (that is, every week from July 4, 1990 to present).

Consequences of a Fail

MBS market participants have adopted the convention of allowing a failing seller to make delivery on any business day after the original contracted settlement day at an unchanged invoice price, subject to the constraint that pool notification must occur at least two days before settlement. A seller may fail to provide pool notification to the buyer, in which case settlement is postponed until two days after notification is ultimately provided. Settlement can then get further postponed by pool substitutions and by failures to deliver designated pools.¹⁰

For example, if a seller provides notification on a Tuesday, and then determines Wednesday that it will not deliver those specific pools, it can notify the buyer on Wednesday that it is substituting pools, with delivery of the new pools scheduled for Friday. If the notice of the substitution does not occur until Thursday, then delivery of the new pools is scheduled for Monday. In either case, settlement can get further postponed by further pool substitutions or by failures to deliver the designated pools. Pool substitutions are allowed without restriction and there is no substantive difference between failing because pool notification is not provided and failing because allocated pools are not delivered.

As the buyer does not pay the seller until the seller delivers the securities, the seller loses (and the buyer gains) the time value of the transaction proceeds over the fail interval. This time value can be quantified as the interest that could have been earned on the transaction proceeds in the overnight money market. The prospect of losing the time value of the transaction proceeds provides a financial incentive for the seller to make delivery on the settlement date or as soon as possible thereafter.

The ability of a seller to identify and deliver the least valuable collateral (delivery option value) reduces the cost of failing to deliver on a TBA trade. Pool substitutions provide one way of benefitting from this option value over the short term. After a seller notifies a buyer of the specific pools that will be delivered, but before delivery occurs, the seller will

¹⁰ An informal survey of a number of market participants suggests that “unallocated” fails associated with TBA trades (that is, fails for which the seller has not provided pool notification pursuant to a TBA trade) account for most fails when measured by dollar volume.

sometimes choose to substitute other pools that are less valuable. That is, even if the cheapest-to-deliver has not changed, the seller may come into possession of pools less valuable than those originally specified. In such instances, the seller fails and settlement gets rescheduled until two days after the new notification date. The cost of failing is less than the time value of the transaction proceeds because the seller is benefitting from its ability to substitute a less valuable security.

Another way in which a seller can benefit from delivery option value is if the cheapest-to-deliver security changes, which can and does happen over time, especially in a volatile market. That is, when a seller is deciding whether or not to make delivery, it knows there is some possibility that the cheapest-to-deliver security will be different in the future. Instead of delivering a security that is cheapest-to-deliver today, but perhaps not tomorrow or next month, the seller can postpone delivery and decide on the pools to deliver when time has passed and the cheapest-to-deliver may have changed. As above, the option value means that the cost of failing is less than the time value of the transaction proceeds over the fail interval.¹¹

Avoiding Fails

While fails due to miscommunication or operational problems are difficult to eliminate, fails due to other factors can often be avoided. A fail stemming from a short position can sometimes be averted by effectively borrowing the needed securities through the “dollar roll” market from a third party, and delivering the borrowed securities to the buyer (see Box 2 for a description of dollar rolls). The borrowed or substantially similar securities are returned at the completion of the second leg of the dollar roll. Importantly, using the dollar roll market to fulfill delivery may not avert a fail if one’s counterparty in the dollar roll fails to deliver securities at the scheduled settlement of the first leg of the roll.

¹¹ Note that delivery option value is mitigated by the use of “CPR claims.” A buyer may seek cash compensation if it receives MBS pools that have worse prepayment characteristics than a benchmark set of the same TBA coupon securities. However, despite the claims process, a seller may still benefit from failing if it is able to identify and hold-back securities with superior prepayment characteristics as compared to the benchmark securities.

A fail stemming from an inability to deliver securities because of a failure to receive securities can also sometimes be averted by delivering borrowed securities. However, this requires that the market participant know of the failure to receive with sufficient lead time. If a market participant does not find out about a failure to receive until the monthly settlement day, for example, then there would be insufficient time for the participant to borrow securities through the dollar roll market to avoid a failure to deliver, given the two day time lag between pool notification and settlement. In fact, given the monthly liquidity cycle of TBA trades, the participant would not be able to borrow securities through the roll market to make delivery until the next month.

In addition to borrowing securities through the dollar roll market, market participants can also sometimes avoid failing by choosing to deliver more expensive securities than the cheapest to deliver. That is, a seller with other, more valuable securities in its inventory that meet the terms of the trade may choose to deliver them to meet its delivery obligation.

In deciding whether to try to avoid failing or not, market participants compare the cost of failing to the cost of acquiring securities in the dollar roll market (or of delivering more expensive securities). As mentioned, the most immediate cost of failing is the time value of money, approximated by a firm's short term cost of funds, although this cost is offset somewhat by the value of the delivery option. It follows that market participants should want to avoid failing as long as the cost of borrowing securities (or delivering more expensive securities) plus the value of the delivery option is less than the relevant cost of funds over the appropriate term.¹²

Why Fails Sometimes Persist

Typically, the cost of borrowing securities is well below the general level of short term interest rates and fails remain at low levels. At times, however, the cost of borrowing

¹² When considering borrowing securities through a dollar roll, the term of the dollar roll is the appropriate term for the cost of funds. If one is considering delivering relatively expensive securities, but there is the prospect of receiving less expensive securities within a month, which one could then redeliver, then the cost of funds over a shorter term could be appropriate.

securities is close to the level of short rates, either because borrowing costs are high or because interest rates are low. As the cost of borrowing securities gets closer to the prevailing short-term interest rate, the incentive to borrow securities to avoid failing declines. When the cost of borrowing roughly equals the relevant interest rate, many market participants are essentially indifferent between failing and borrowing securities to avoid failing.¹³ Periods when security borrowing costs are near the short-term rate thus tend to be characterized by persistently high fails.

Borrowing costs are more likely to come close to the level of short-term interest rates when there is strong demand to borrow a security or when the lendable supply of the security is limited. Demand to borrow a security is particularly strong when there is substantial short interest in the security. Lendable supply differs across securities due to differences in issue amounts and investor bases.

An interesting feature of the TBA market is that there is considerable uncertainty about security supply even as MBS are being traded for forward delivery. Uncertainty about supply emanates from uncertainty about mortgage originations, with pipeline fallout – or borrowers deciding to forego loan commitments – a key factor in origination shortfalls. The uncertainty means that mortgage originators and other market participants can sometimes be caught with short positions that are hard to cover because of lower-than-expected new supply. Further supply uncertainty results from the fact that TBA contracts are made based on participants' views of the availability of the cheapest-to-deliver cohort within a given coupon. Because the cheapest-to-deliver cohort changes over time, based on prepayment rates and expectations as well as other characteristics, estimates of TBA supply can be quite different across participants.

There is also considerable uncertainty about secondary market demand for MBS. Collateralized mortgage obligations (CMOs) are one source of uncertainty. MBS delivered into a CMO are effectively removed from the TBA market on a permanent basis. Moreover, dealers incur an explicit financial penalty for failing to deliver collateral into a CMO deal. As

¹³ Other costs of failing, many of which become more significant if fails persist, are considered below.

a result, dealers prioritize their delivery obligations in favor of CMOs and will sometimes hold securities in inventory in advance of a CMO deal closing, while failing to deliver to other counterparties, to ensure that they have the securities for delivery into the CMO at the time of the closing.

Aside from high demand or low supply, borrowing costs are also more likely to come close to the general level of short-term interest rates when rates are low. In such an environment, security borrowing costs can more quickly reach the point at which market participants are roughly indifferent between failing and borrowing securities to avoid failing. With the fed funds rate currently in a 0 to 25 basis point range, for example, there is little margin before security borrowing costs reach the general level of short-term interest rates, making the incentive to borrow securities negligible.

In fact, at a low level of interest rates, delivery option value may exceed the cost of funds, so that market participants have an economic incentive to fail even when the dollar roll is not trading special. That is, even a seller with the cheapest-to-deliver security in its inventory might choose to fail to deliver so as to retain the option to deliver a possibly different cheapest-to-deliver security the following month. Low rates also exacerbate the prevalence of other actions, such as pool substitutions, by decreasing the costs of failing associated with such activities.

Moreover, at times, security borrowing costs can exceed the level of prevailing short-term interest rates (that is, the dollar roll is sufficiently special such that it trades with a negative implied financing rate) and there can be an incentive for market participants to strategically fail.¹⁴ That is, a participant may enter into a transaction to lend securities with no intention of immediately making delivery (see Box 3 for additional details). The incentive to undertake strategic fails may be mitigated by ancillary costs of failing, discussed below.

¹⁴ While market participants can typically choose to fail at an implied zero rate, the dollar roll can trade at a negative implied rate because participants need securities to deliver into a CMO, because certain participants have a no or minimal fails policy regardless of the cost of the roll, and because certain customers require delivery.

Episodes of fails can be self-perpetuating. If borrowing costs are near the general level of interest rates and fails mount, some market participants who would otherwise lend securities through the dollar roll market may decide to step back from the market to avoid borrowers who might fail to return securities on a timely basis. The reduced supply of securities available for lending exacerbates and prolongs the fails situation. In addition, those with strong incentives to deliver that do not have a position already in hand may over-borrow securities to ensure the ability to deliver, further exacerbating the misallocation of scarce securities.

A particular pattern that arises in the TBA market is that securities that fail to settle on the monthly settlement date announced by SIFMA often remain failing for at least a month. While fails attributable to pool sorting or pool substitutions often get resolved within a few days, fails emanating from a longer-term decision by a seller to not avoid failing often remain outstanding. A market participant who declines to borrow securities in the TBA market to avoid a fail is most likely making the calculation that the cost of borrowing securities for a month to avoid failing exceeds the cost of failing over that interval.

Insufficient incentive to avoid failing in a low interest rate environment helps explain the two most significant episodes of high and persistent fails. In 2003, when the fed funds target rate reached 1%, average daily fails to deliver peaked at \$126.6 billion in the week ending June 18, a record for the time, and averaged \$44.6 billion over the year. In 2010, with the fed funds target rate in a 0 to 25 basis point range, average daily fails to deliver peaked at a new high of \$175.1 billion in the week ending November 17, and averaged \$83.3 billion over the year.

4. Why Fails Matter

Fails are Inefficient and Impose Costs on Participants

A settlement fail means that what was contracted to occur does not. A buyer is effectively left covering a seller's short position and may have nothing itself to deliver should it want to sell. While a buyer is implicitly compensated for the delayed delivery in that it



gets to keep its money until settlement finally occurs, the compensation is often not at a fair market price. That is, the buyer finances the seller's position at a 0 percent interest rate, whereas the fair market price might call for additional compensation. Moreover, the compensation is somewhat arbitrary and unrelated to the fair market price in that it is determined solely by the general level of short-term interest rates.

Because a buyer who is failed to may not be fairly compensated, securities can end up being allocated in an ad hoc and suboptimal way. In markets, goods are allocated to their highest value use via the price mechanism. With settlement fails, the market mechanism breaks down, so that securities are sometimes allocated to those with lower value uses. Dealers facing fails to deliver will attempt to ration scarce securities to the highest value users, but such allocations are somewhat ad hoc and, even if done optimally at particular dealers, rarely result in optimal allocation across all market participants.

Settlement fails also result in counterparty risk (or counterparty insolvency) between the time of the initially scheduled settlement and ultimate settlement. If a seller becomes insolvent prior to settlement, the buyer will incur a loss if the price of the security has risen and the buyer has to find a replacement seller at a higher price. Conversely, if a buyer becomes insolvent prior to settlement of a trade, the seller will incur a loss if the price of the security has fallen and the seller has to find a replacement buyer at a lower price.

As a result, settlement fails of MBS result in extra counterparty credit risk being traded along with mortgage risk. That is, an investor solely interested in a transfer of mortgage risk finds, as a result of settlement problems, that it cannot trade pure mortgage risk and instead must take on some unwelcome counterparty risk.

In recognition of the counterparty credit risk associated with fails, the Securities and Exchange Commission (SEC) imposes capital charges on aged fails for broker dealers.¹⁵ To cover the counterparty credit risk, dealers have to maintain additional capital for fails to deliver five or more business days old and for fails to receive more than thirty calendar days old. The charges absorb capital that would otherwise be available to support other business

¹⁵ Code of Federal Regulations, title 17, part 240, sections 15c3-1(c)(2)(iv)(E) and 15c3-1(c)(2)(ix).



activity. The capital charges are not always binding, however, in that a firm may have excess regulatory capital. In addition, the capital charges may not be communicated to a firm's trading desk despite the TMPG's best practice recommendations¹⁶.

Increased labor costs and worsened customer relations can also result from fails. Labor costs can rise as dealers divert back-office personnel from their usual assignments to efforts aimed at reducing fails. Customers can become unhappy when they do not receive the securities they have purchased, even after long delays. This leaves customers in the position of involuntarily financing dealer short positions, holding uncompensated dealer credit risk, and means that they themselves may have nothing to deliver should they decide to sell.

A final point on the inefficiencies and costs imposed on participants is to recall that episodes of high and protracted fails seem to be brought on to a large extent by a low interest rate environment. That is, the market convention of postponing failed deliveries at an unchanged invoice price often provides low incentive to make delivery when rates are low. However, there is no reason a priori that a low rate environment should adversely affect the way in which a market functions. That is, even when short-term rates are near zero, one would think that market functioning should be as good as it typically is when short-term rates are higher.

Fails Have Systemic Costs, Adversely Affecting Liquidity and Market Stability

Aside from the costs to the counterparties of a trade, fails can have implications for other market participants. Market liquidity and stability can be adversely affected if market participants temporarily withdraw from, or even exit, the market to avoid the costs associated with fails. Such liquidity costs are of particular interest because they are not fully internalized by the counterparties to a failed trade, but are partially borne by other parties.

¹⁶ See "Best Practices for Treasury, Agency Debt, and Agency Mortgage-Backed Securities Markets," posted at <http://newyorkfed.org/tmpg/bestpractice_09142010.pdf>.

Note that the effects of fails on market liquidity and stability need not be linear. That is, there may be “cliff effects” whereby market participants rapidly exit as market functioning and liquidity in the MBS market deteriorate, leading to further deterioration in market functioning and liquidity. As a consequence, good market liquidity at one level of fails does not imply that liquidity could not worsen significantly at a somewhat higher level of fails.

Moreover, it is unlikely that the effects of fails on market liquidity are constant over time. The decision of a market participant to enter or exit the market is likely not made lightly given the fixed costs involved, so that a high level of fails may not be problematic if the fails are short-lived, but could have sustained adverse effects if they persist for an extended period and cause market participants to exit. The effects of fails on market liquidity may also be time-varying because they are contingent upon, or exacerbated by, other factors. Evolving concerns about the health of financial institutions, for example, might cause a high but stable level of fails to suddenly become problematic.

While settlement fails tend to arise in particular sectors of the market, liquidity could also be affected in other sectors. In particular, if market participants lose confidence in market functioning, that may affect their behavior in the MBS market more broadly, and not only in the sectors with the fails problems.

It is also important to note that fails can have implications for those not directly involved in the secondary MBS market. As reduced market liquidity increases transaction costs for other participants in the secondary market, it likely increases the required rate of return for MBS investors.¹⁷ This, in turn, increases the costs of securitization for MBS originators and ultimately the mortgage rates paid by homeowners in the primary market.

MBS fails could also have implications for those outside of the mortgage market. In particular, liquidity disruptions in a core fixed income market such as the MBS market could

¹⁷ Many studies show that security liquidity and required returns are negatively correlated (e.g., Amihud and Mendelson (1986) and Pastor and Stambaugh (2003)).



cause instability or lessened liquidity in financial markets more broadly. Increased counterparty credit risk or the capital charges from persistent fails, for example, could cause market participants to curtail their risk taking in financial markets more generally.

The effect of fails on market liquidity has been deemed important enough in the U.S. Treasury securities market for market participants and policymakers to respond on various occasions.¹⁸ In 2008, the TMPG recommended the introduction of a financial charge on fails in the Treasury market. In announcing its recommendation, the TMPG noted that “widespread and persistent fails prevent efficient market clearing and impose credit risk on market participants, and are therefore damaging to overall market liquidity.”¹⁹

5. How Fails Were Addressed in the Treasury Market

The successful effort to mitigate fails in the U.S. Treasury securities market may serve as a model for how fails can be mitigated in the MBS market. Historically, the market convention in the Treasury market was the same as it is in the MBS market, so that failed settlements would get rescheduled to the next business day at an unchanged invoice price. This convention meant that market participants often had little incentive to avoid failing when security borrowing costs were high and/or overnight interest rates were low and set the stage for instances of high and persistent fails after September 11, in the summer and fall of 2003, and following the bankruptcy of Lehman Brothers Holdings in September 2008 (Fleming and Garbade, 2002, 2004).

The breadth and persistence of the 2008 fails led the TMPG to promote a change in market convention whereby a buyer can claim compensation from a seller if the seller fails to deliver securities on a timely basis.²⁰ The TMPG fails charge was intended to provide an

¹⁸ Examples include the introduction of the book-entry system for Treasury securities in 1968 (described in Garbade, 2004), the Federal Reserve's introduction of a securities lending facility in 1969 (described in Fleming and Garbade, 2007), and the Treasury Department's decision to unexpectedly reopen a ten-year note after the September 11, 2001 attacks (described in Fleming and Garbade, 2002).

¹⁹ See TMPG announcement “Treasury Market Practices Group Endorses Several Measures to Address Widespread Settlement Fails”, posted at <<http://www.newyorkfed.org/tmpg/PR081112.pdf>>.

²⁰ Garbade, Keane, Logan, Stokes, and Wolgemuth (2010) describe the introduction of the fails charge.

incentive to make delivery when short-term interest rates are below 3 percent comparable to the incentive to make delivery when short-term interest rates equal 3 percent. This voluntary practice regime was introduced and widely adopted for transactions on or after May 1, 2009 (based on trade date).

The introduction of the fails charge seems to have thus far been successful at mitigating settlement fails in the Treasury market. The charge immediately widened the range of possible clearing prices in the repo market, thus allowing supply and demand to meet more often at market clearing prices. Moreover, settlement fails quickly fell to their lowest level since November 2000. There have been some spikes up in fails since the introduction of the fails charge, but fails have then quickly reverted to low levels.

6. Conclusion

Instances of elevated and protracted settlement fails in agency MBS are related to market participants' incentives to avoid failing. Specifically, the market convention of allowing failed settlements to be postponed at an unchanged invoice price means that the cost of failing varies directly with short-term interest rates. In a low rate environment, the cost of failing is generally modest and sellers often have little incentive to take steps to meet their delivery obligations on a timely basis. While low rates do not cause settlement fails in and of themselves, they provide an environment in which fails can thrive, regardless of their initial cause.

Such settlement fails are important not only to the counterparties of a failed trade, but to market participants generally. To the counterparties of a trade, fails can increase operational costs and counterparty credit risk, absorb scarce capital through regulatory charges, and damage customer relations. More generally, the prospect of persistent settlement fails at a high level can cause market participants to temporarily withdraw from the market, or even exit the market, adversely affecting market liquidity and stability more broadly.



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Box 1: FR 2004 Settlement Fails Data

Primary dealers report market data to the New York Fed as part of their trading relationship with the Bank. Dealers started reporting settlement fails data in July 1990. The dealers report failures to receive and failures to deliver across four broad security classes: U.S. Treasury securities, agency debt securities, agency MBS, and corporate debt securities. The data are reported to the Fed weekly, as of the close of business each Wednesday. The Fed subsequently publishes data aggregated across the dealers.²¹

The fails are reported on a cumulative basis for each week, including non-trading days. For example, if a dealer fails to deliver \$50 million of securities to a customer as scheduled on a Thursday, but makes delivery on Friday, one day late, the dealer reports \$50 million in fails. However, if the delivery is not made until Monday, four days late, the dealer reports \$200 million in fails (\$50 million × 4 days). Given the cumulative manner in which fails data are reported, per day averages are calculated by dividing the reported weekly numbers by seven.

Note that the data only reflect fails involving primary dealers. If primary dealer A does not deliver a security to primary dealer B as scheduled, for example, then dealer A reports a fail to deliver and dealer B reports a fail to receive. In contrast, if primary dealer A does not deliver a security to customer C, then dealer A reports a fail to deliver and the fail to receive is not reported. A settlement fail is not reported if neither the buyer nor the seller is a primary dealer.

Outright and financing transactions are combined in the fails data. That is, failures to deliver securities sold outright are combined with failures to deliver securities sold or lent as part of a financing transaction (such as a dollar roll). Fails on outright transactions are reported at the par value of the transactions while fails on financing transactions are reported at the amount that was to be paid or received on the scheduled settlement date.

²¹ Links to the reporting form and instructions and to other related information are available on the New York Fed's website at <<http://www.newyorkfed.org/markets/primarydealers.html>>.

Box 2: Dollar Rolls

Dollar rolls are a form of collateralized financing particular to the agency MBS market involving the purchase or sale of an agency MBS with a simultaneous agreement to resell or repurchase MBS at a specified price on a future date. In contrast to a repurchase agreement (repo), the buyer of the dollar roll need not return the particular securities borrowed, but only need return “substantially similar” securities. Moreover, also unlike a repo, the buyer of the dollar roll receives the principal and interest payments between the purchase and resale dates. It follows that the buyer is subject to the market risk associated with the prepayment risk of the securities over the financing period.

The price of the dollar roll is usually quoted by the “drop,” or difference, between the initial purchase price and the resale price. The resale price is usually lower than the initial purchase price to compensate the seller for losing interest and principal payments over the financing period. Since the buyer receives the cash flows over the roll period, the coupon rate, scheduled principal payments, and projected unscheduled payments are key factors in determining the price. Taking account of the various cash flows, the price drop can be expressed as an “implied financing rate” for a security.

As in the repo market, securities can trade “special” in the dollar roll market, whereby a security’s implied financing rate is below the cost of funds. That is, demand for the collateral deliverable into a dollar roll can be sufficiently high that market participants will accept a below-market rate, or even a negative rate, on the cash loaned in a TBA in order to “borrow” the securities for a month. The dollar roll is typically considered to trade special after surpassing a threshold of 25 basis points below the cost of funds.

Box 3: Strategic Fails

A strategic fail can work as follows. An investor compares where the dollar roll is trading to the costs associated with failing for the month (i.e., capital charges, balance sheet usage, acquiring pools at the end date of the roll period to settle the fail, etc). If the investor determines that the expected value of selling the roll and then failing is positive after considering all costs, it may opt to sell the dollar roll without a position in the underlying securities. Since the investor does not have an underlying position in TBAs or pools, to ultimately settle the trade and earn the positive value from failing, the investor can simultaneously buy and sell a dollar roll for the following month. The example below would not be consistent with TMPG best practices, but is illustrative of the way strategic fails might be carried out, and may be useful in considering appropriate monitoring of fails.

The transactions and settlements (or settlement fails) are as follows:

Month 1: Investor sells the dollar roll to dealer A and fails to deliver at the starting leg of the transaction.

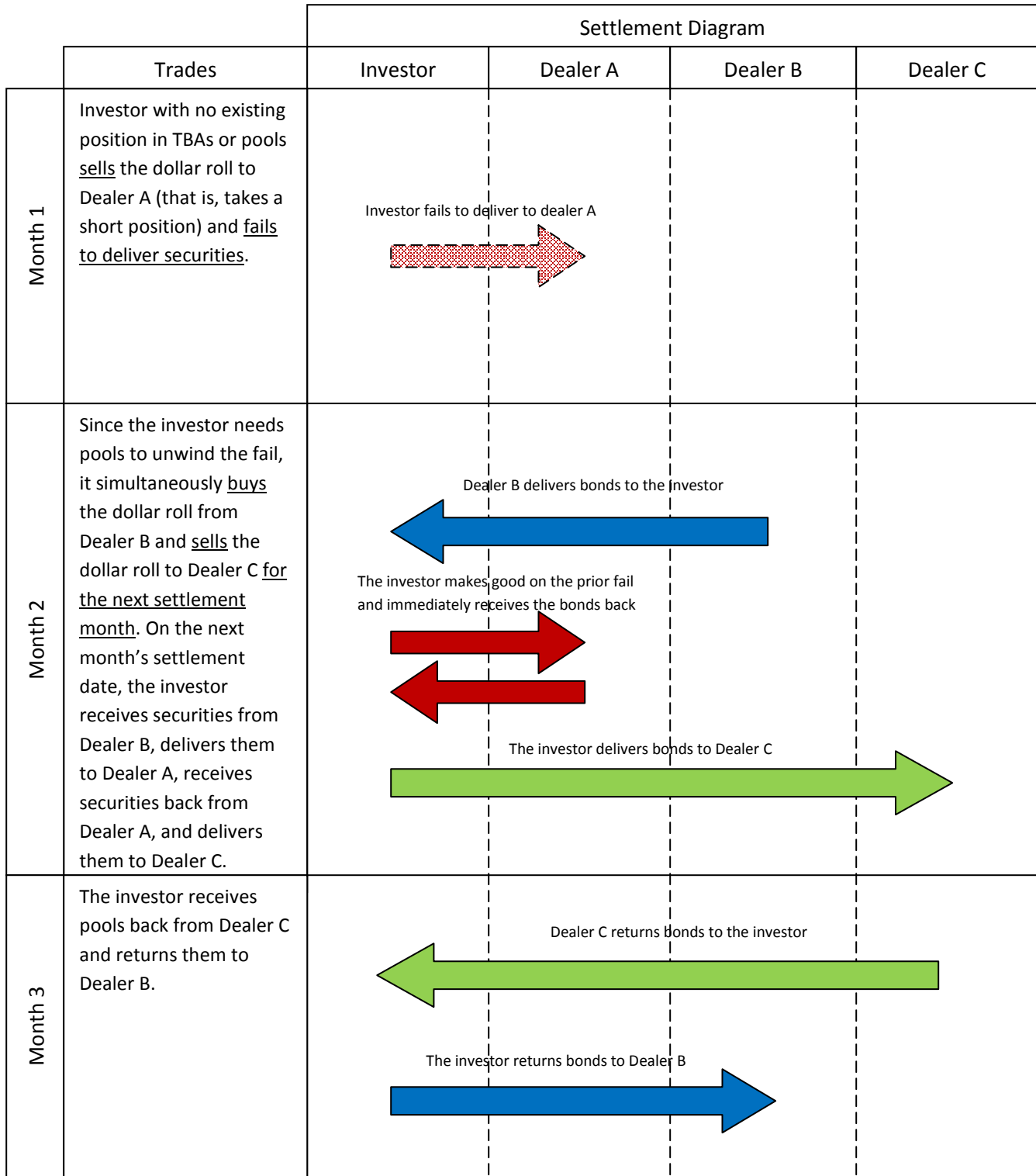
Month 2: Investor simultaneously buys the dollar roll from dealer B and sells the dollar roll to dealer C. On settlement day, the investor delivers TBA pools received from dealer B to dealer A to satisfy delivery on the initial roll trade (albeit a month late). Dealer A then returns TBA pools to the investor to settle the back leg of the initial roll trade. Those pools are then delivered to dealer C to satisfy delivery from the sale of the roll.²²

Month 3: Investor receives pools from dealer C and delivers those pools to dealer B. All transactions are completed.

²² If the investor clears through a facility that nets delivery obligations across multiple participants, the investor would need to perform the Month 2 transactions after the cutoff time for netting to ensure that the simultaneous purchase and sale transactions are not netted against one another. In contrast, there is no risk that the delivery to and receive from dealer A will net because the obligations to deliver and receive are originally scheduled for different months. In addition, the investor would have to ensure that the bonds purchases in Month 2 are eligible to satisfy the delivery obligation in Month 1.



Through this series of transactions, the investor earns the differential between “fail” and the implied specialness in the roll at Month 1, less transaction costs. The profit opportunity arises because the buyer of the dollar roll is willing to accept a lower transaction price at the closing leg of the dollar roll in order to effectively borrow securities over the term of the roll, and must accept the lower transaction price at the closing leg even if it just received the securities that day and not at the originally scheduled starting leg of the transaction.



Note: Cross-hatch fill and dashed outline arrows denote failed settlement. Solid fill and solid outline arrows denote actual settlement.