CANARIES IN THE COAL MINE

How the Rise in Settlement "Fails" Creates Systemic Risk for Financial Firms and Investors

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Harold Bradley, Robert Fawls, Robert E. Litan, and Fred Sommers[1]

Executive Summary

Financial plumbing is taken for granted, except when things go wrong. It was only a few years ago, for example, that the Federal Reserve Bank of New York saw the mess in the derivatives market, where transactions were recorded on slips of paper and sometimes misplaced before the Fed forced the major banks that were part of that market to clean up their act.

In this essay, we focus on other parts of the financial plumbing that now must be fixed, sooner rather than later. In particular, we address:

- extremely high and rising number and frequency of "fails to deliver" in mortgage-backed securities transactions (MBS) and in exchange traded Funds (ETFs);

- the sheer size of the outstanding trades agreed to by counterparties that do not settle on time in relation to the liquidity and capitalization of banks and intermediary firms; and

- the scale of the systemic risk posed by securities that fail to deliver, and how this activity steals value from investor portfolios.

Our central conclusion is this: Every fail introduces a cumulative and potentially compounding liquidity risk into the orderly process of settling the $7.5 trillion of security transactions completed each day, which could be especially dangerous during times when financial institutions are short of liquidity (as was true during the financial crisis of 2008).

[1] Harold Bradley is Chief Investment Officer of the Kauffman Foundation, where Robert E. Litan is Vice President for Research and Policy. Robert A. Fawls and Fred E. Sommers are partners in Basis Point Group, a capital markets operations research consulting firm. This essay extends the earlier work of Bradley and Litan in *Choking the Recovery: Why New Growth Companies Aren't Going Public and Unrecognized Risks of Future Market Disruptions*, November 12, 2010, available at www.kauffman.org. Fawls and Sommers have conducted and published many analyses of capital markets operations risk, including contributing monthly operational and systemic risk indices to Institutional Investor's *Wall Street Letter* news website and Incisive Media's *Operational Risk & Regulation* magazine. This essay extends their earlier work on *Operations Performance Measurement, a Framework for Success*, first published in the Citigroup *Investment Management Review* (February 2006), describing an effective framework for measuring the integrity of financial processes. Fawls and Sommers were issued a patent on this methodology in August 2009.

The settlement fails problem is readily resolvable. Both the Federal Reserve and the Securities and Exchange Commission (SEC) have penalized fails in the U.S. Treasury and equities markets with successful outcomes. The appropriate federal regulators therefore should:

- Impose penalties or fees for all transaction fails on all securities types that will offset financial gains derived from late settlement of trades, usually at investor expense;

- Broaden the reporting of transactions where counterparties fail to deliver on time, and include all transaction activity for all major organizations; and

- Improve the analytic framework required to understand how markets are operationally connected and the potential failure points in today's tightly coupled systems.

Background: Settlement and Settlement "Failures"

Securities markets work only when the parties to transactions—buyers and sellers—honor their commitments. Buyers pay cash, sellers give securities. This is called settlement. Fails introduce significant additional unplanned manual effort to correct errors and complete transactions in this highly automated clearing and settlement process. Fails draw operational focus away from other mission-critical oversight and administrative tasks, increasing the risk in other processes that may have no relationship to the fail.

This is so fundamental that everyone assumes that all of this works flawlessly, and we all take timely settlement for granted. The vast majority of applications used in front office operations to analyze, track, and trade securities operate solely on a trade date basis. Trade-date based systems assume that all transactions complete successfully on the settlement date. These include all high-frequency trading systems and complex hedging models. For instance, the Depository Trust and Clearing Corporation (DTCC), which is owned by its customers, who are members of the financial community such as banks, broker/dealers, and mutual funds, takes for granted efficient settlement and often reports trades as "settled" to retail and institutional customers on the settlement date when the securities may not yet have arrived in the customer's account. DTCC assumes things ultimately will work out.

Unfortunately, transactions often do not settle on time—they fail because one of the parties doesn't honor the transaction. Fails happen because one party wants to delay settlement to engineer an economic reward and the authorities appear to be letting this happen.[2] Or, alternatively, a delay or outright failure to settle a transaction occurs

[2] Dividends, stock voting, and very high interest rates earned for lending securities all are economic rewards that can be engineered by customers of custody firms who fail to deliver securities on the expected date.

because one or both parties has financial difficulties that force a delay or failure (they can't come up with the cash to buy, or they don't have or can't borrow the securities to deliver).

More specifically, an investment firm's portfolio manager or, indeed, a broker-trader may buy or trade a security with the belief that they effectively hold it in their portfolio or inventory because it appears as a settled trade on customer records or is due from another firm on or before settlement date but does not arrive. Alternatively, the firm may trade a security with the belief that it easily could acquire it before the settlement date based on pre-trade requirements to "locate" an owner who promises to lend the shares but subsequently finds out the shares are not available to borrow. Counterparties to a securities trade who choose not to deliver often do so because there is "insufficient incentive not to fail" and the firm can earn an incremental fee using the security to collateralize a repo or other structured transaction.[3] On rare occasions, administrative or operational issues may cause a fail, but these are infrequent in relation to the other causes.

A complicating matter for both institutional and retail investors in almost all securities classes is that the DTCC, the broker-owned clearing house, reports failed trades to buyers as "security entitlements" and buyers therefore believe they have the securities free to sell, such as with some heavily shorted ETFs. This happens even though the DTCC's own books show that trades are outstanding, in a "failed" condition. If sellers have not yet delivered the securities to the custody agent, this leaves institutional and retail buyers unaware of the actual ownership status of the securities in question. The language of the trade intentionally masquerades failed-to-deliver securities, or IOUs in the common vernacular, as something that is neither menacing nor contrary to the economic interests of institutional or retail investors.

With respect to ETFs in particular, two of the authors of this paper addressed the problem of ETF fails to deliver in a previous paper, where we raised concerns about Susquehanna Financial Research Group's assertion that "a redeeming Authorized Participant must be able to represent that the shares tendered for redemption are in fact in a deliverable state."[4] Given the imprecise regulatory requirements governing DTCC's required disclosures of failed trades, this creates both a regulatory and retail investor problem during times of great systemic stress when the deliverable state of an ETF may be impossible to determine in the short run.

As we discuss in more detail below, the ultimate effect of all of these actions, omissions, or errors is the same: *every fail introduces a cumulative and potentially compounding liquidity risk into the orderly process of settling the $7.5 trillion of security transactions completed each day.*

[3] Michael J. Fleming and Kenneth Garbade, "Explaining Settlement Fails," *Current Issues in Economics and Finance* 11, no. 9 (New York: Federal Reserve Bank of New York, September 2005).
[4] See Bradley and Litan, *Choking the Recovery*, 55.

Even under normal trading conditions, the more benign explanations for fails should not satisfy regulators. If the failed trades result from intentional failures to settle, then the authorities are letting parties game the system at the expense of the beneficial securities owners such as state pension funds, mutual funds, and retail investors, who all suffer economically as a result of this behavior. If counterparty risk or financial solvency leads to failures, and especially at the currently high and rising rate of failures in mortgage securities and ETF transactions discussed in greater detail, this should warn regulators that markets might be showing signs of duress that can lead to systemic crisis such as that experienced in 2008. Already, some may be forgetting that large and sophisticated investors were harmed seriously in the aftermath of the 2008 financial crisis when they learned that large custody agent pools lent their shares to failed hedge funds, collateralized by Lehman Brothers and Bear Stearns securities that became virtually worthless, and ultimately left the pension funds and endowments as unwilling creditors in bankruptcy proceedings. Fails thus represent a true canary in the coal mine of the financial markets.

The Disturbing Rise in Settlement Fails in Mortgage Securities and Exchange Traded Funds

There have been worrying patterns of settlement fails in equity and Treasury securities in the past. Regulators and industry organizations investigated the reasons for these failures and imposed solutions that greatly reduced the fail rate, eliminated the ability to "game the system," and dramatically reduced risks in these asset classes.

The Fed, through the Treasury Market Practices Group (TMPG), imposed a 3 percent fails charge on all Treasury settlement failures. Likewise, the SEC in 2008 and 2009 also heavily penalized the practice by requiring failing brokers in equities transactions to purchase or borrow the securities by the morning of the fourth day after the transaction (T+4). If brokers did not fulfill this obligation they were required to pre-borrow securities on all future short transactions, which gave brokers very strong incentives to settle up.[5] Both the Fed and SEC actions reduced fails substantially in Treasury markets and in individual equity securities, indicating that traders in financial markets had previously been gaming the system. For years, Wall Street trading interests had lobbied against such penalties, attributing such failures to technical problems and record-keeping glitches. History shows this was not an accurate representation of failed trades.

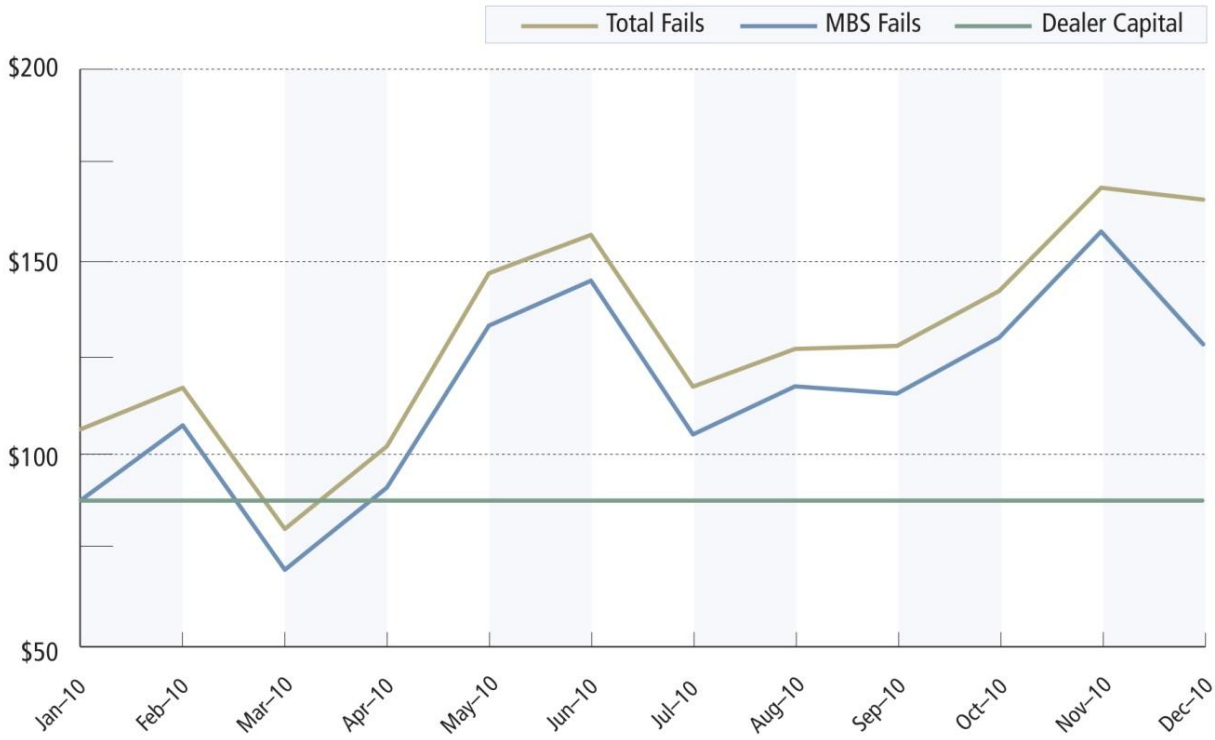
Unfortunately, like squeezing a balloon, the fails problem has not gone away. It simply has moved to markets where fails are not punished. For example, the Treasury Department's primary dealers reported that in all but five weeks during 2010, sellers of Treasury, MBS, agency, and corporate fixed income securities failed to deliver each day

[5] In October 2008, the SEC adopted temporary Rule 204T of Regulation SHO, and made the rule permanent effective July 31, 2009. As the Commission states in its final rule, "Where a seller of securities fails to deliver securities on settlement date, in effect the seller unilaterally converts a securities contract … into an undated futures-type contract, to which the buyer might not have agreed, or that might have been priced differently."

an average of $130 billion of securities on the expected settlement date, a number so large that it exceeds the combined $89 billion regulatory capital of these institutions. During the week of November 24, 2010, daily fails of these securities exceeded primary dealer regulatory capital by more than two-and-a-half times.

In the same week, the primary dealers reported to the Federal Reserve that total MBS fails exceeded $1.3 trillion, an amount never before recorded in the more than fifteen years the Fed has collected data. This is the third time fails exceeded $1 trillion in less than six months during 2010, which continues a pattern of increasing MBS fails that has evolved since May 2009 when a penalty was put in place to stop persistent fails of Treasury securities.

Figure 1: MBS and Total Fails vs. Primary Dealer Capital ($s in Billions)



It is impossible to know without more compulsory data reporting by the primary dealers and custodians exactly what accounts for these patterns, or whether regulators even are aware of the problem or its causes. The systemic risk to these dealers' liquidity is evident from the sheer size of the numbers and the potential impact on any firm's ability to continue operations if it were forced to honor commitments in these transactions during another crisis in either liquidity or counterparty confidence.

Another major liquidity problem may be simmering given the rising frequency of fails in ETF securities. Currently, ETF fails account for approximately 60 percent of the nearly $2 billion of daily equity trading fails reported to the SEC, and on some days they account for 90 percent of all exchange traded fails. Understanding the cause of ETF

fails is even more complex given the number of intermediaries involved in the creation, marketing, sale, pricing, and safekeeping of ETF securities. Mandatory reporting for each of six legal entities[6] involved in the daily maintenance of each ETF security would assure that investors understand the inherent risks in the wide range of ETF construction and trading strategies.[7]

As we discuss further below, it is anomalous that ETF fails apparently are not subject to the same kinds of penalties that the SEC has imposed on settlement failures for equities (the SEC's rule 204T discussed in footnote 5 makes no specific mention of ETFs, implying that they are exempt from the rule). Promoters of ETFs liken them to stocks since they easily can be traded and sold at all times like stocks (even though in their portfolio composition ETFs more closely resemble mutual funds, which are not tradable and rely on basket creation and destruction, which may be difficult in a liquidity crisis). It is somewhat surprising to us that in addressing settlement failures for all equities, the SEC has not yet insisted on including ETF fails within its current rules. We suggest below ways of fixing that particular problem.

In short, except for the fees for Treasury security fails and the SEC's requirements relating to equity fails, dealers are not required to take any charge against fails for other financial instruments until five days after settlement. All money market, fixed income, and equity trades are mandated to settle at the trade date plus one, two, or three days. Only after T-plus-eight days does the SEC specify that "…*a government securities interdealer broker shall deduct from net worth ¼ of 1 percent of the contract value of each government securities failed-to-deliver contract which is outstanding 5 business days or longer. Such deduction shall be increased by any excess of the contract price of the failed-to-deliver contract over the market value of the underlying security."*[8] The regulatory capital charge on a primary dealer for a failed MBS and ETF transaction is thus negligible. Custodians, the other major players in the game, suffer no penalties or charges against capital for any form of fails. Consequently, the regulatory treatment of failed-to-deliver securities today creates a system whereby Wall Street trades for free while the parties to securities transactions unwittingly finance the Street's highly profitable trading activities.

Putting Settlement Fails in Perspective

There are several ways to assess the significance of the current volume of fails. None are comforting.

[6] These include fund sponsors, fund distributor, custodian, authorized participant, investment managers, and transfer agents.

[7] This issue takes on added urgency in the wake of media reports that the SEC is investigating hedge funds for portfolio "stripping" or hiding insider trading through use of ETF securities. See http://seekingalpha.com/news-article/575004-of-etfs-and-stripping.

[8] The level was set in 1987. See 15 U.S.C. 78o–5(b)(1)(A), (b)(4).

As just noted, the daily level of fails during 2010 exceeded the combined regulatory capital for all of the U.S. government's primary dealers as well as the total shareholder equity of the major custodian banks in that year.

Another way to understand the impact of fails is through the dynamics of the transaction markets. We conduct this analysis by reviewing, in turn, data on both the amounts of securities outstanding and then their transactions volumes.

Securities outstanding: The latest data from globalcustody.net (www.globalcustody.net) shows that the total value of assets in custody accounts for the fifty-four reporting custodians is $108 trillion. The market values for each of the major underlying U.S. capital markets by asset type, as of September 2010, are as follows:

Table 1: Market Values by Asset Class

	Market Value
Treasury Securities	$ 8.5 trillion
MBS Securities	$ 5.5 trillion
Agency Securities	$ 2.7 trillion
Municipal Securities	$ 2.8 trillion
Exchange Traded Funds (ETFs)	$ 1.0 trillion
U.S. Corporate Bonds	$ 10.7 trillion
U.S. Equities	$ 15 ± trillion

Table 1 shows that core U.S. securities markets total just over $46 trillion in assets. Foreign equity markets constitute another $ 27 trillion in assets. The remaining $35 trillion of assets consists of foreign fixed income and OTC equities.

Securities Transactions: In 2009, the last period for which figures currently are available, there were a minimum of $1.48 quadrillion in security transactions. This activity includes trades and financing transactions completed through DTCC, which does not capture all transaction activity. Treasury and agency securities totaled $905 trillion ($0.9 quadrillion)[9] or 61 percent of this total volume. The 2009 activity level declined 18 percent from 2008, the year of the market crash, when DTCC processed $1.88 quadrillion.

[9] The value of U.S. fixed income securities transactions is reported quarterly by SIFMA (Securities Industry and Financial Markets Association). The World Federation of Exchanges (WFE) reports the value of equity transactions monthly. Depository Trust Clearing Corporation (DTCC) publishes transaction volume figures in its annual report.

How significant are these trading levels? Using DTCC's activity levels as a conservative estimate, the total value of issued Treasury and agency securities turned over ninety-four times during 2009. This means that the issued securities changed hands at least once every 2.6 business days. This is an extraordinary transaction flow for securities that generally are held in portfolio long term by foreign treasuries, institutional investors, and pension funds. Generally, the faster a system or process moves, the higher the probability that a disruption will cause a catastrophic breakdown.

Table 2 shows the 2009 transaction activity and turnover rates for each of the major securities markets. The total issued value of Treasury and agency securities turned over every two to three days during the period 2005–9. Mortgage securities turned over every three trading weeks and equities, corporate bonds, and ETFs turned over every five trading weeks. The extraordinary velocity of assets flowing through trading intermediaries heightens concerns about systemic risk during periods of duress and any corresponding liquidity crises.

Table 2: Transaction Volumes and Asset Turnover

	Annual Transaction Volumes	Total Issued turns over every
Treasury & Agency Securities	$ 905 trillion	2–3 days
Mortgage Back Securities	$ 95 trillion	14–15 days
Equities, Corporate Bonds and ETFs	$ 209 trillion	27–28 days

Note: DTCC reports the Treasury and agency market and the equity, corporate bond, and ETF market activity combined together so the table derives turnover by combining the total market values in the same manner.

Market Activity and Settlement Failures: With these baseline figures in mind, it now is useful to return to settlement failures, which are delinquent obligations that one party has to another party. Outstanding fails to deliver for both the average and worst days in 2010 are shown in the following table:[10]

[10] "Fails to deliver" are reported weekly to the Fed (FRBNY) and biweekly to the SEC by market participants.

Table 3: Fails—2010 Daily Average and Worst With Comparison to Market Value

	Average Daily Fails	Average Fails Compared to Market Value	Worst Day Fails	Worst Day Compared to Market Value
Treasury Securities	$ 4.1 billion	10.0 bps	$ 21.3 billion	52.0 bps
MBS Securities	$ 114.4 billion	185.4 bps	$ 210.3 billion	340.8 bps
Agency Securities	$ 4.5 billion	15.6 bps	$ 9.4 billion	32.6 bps
U.S. Corporate Bonds	$ 2.8 billion	2.6 bps	$ 4.1 billion	3.8 bps
U.S. Equities	$ 0.4 billion	0.4 bps	$ 1.3 billion	1.3 bps
U.S. ETF Fails	$ 1.0 billion	15.3 bps	$ 7.0 billion	107.1 bps

The first column in Table 3 is the average daily failure rate for each asset type expressed in basis points of the total issued value reported for that asset type. Assuming 250 trading days per year, this index allows us to calculate the total value of all fails in each particular market for the year. The results are illustrated in Table 4.

Table 4: Average Daily Fails as a Percent of Issued Value

	Average Daily Fails (bps)	Annual Fails (% of Issued)
Treasury Securities	10.0 bps	2.5%
MBS Securities	185.4 bps	46.4%
Agency Securities	15.6 bps	3.9%
U.S. Corporate Bonds	2.6 bps	0.7%
U.S. Equities	0.4 bps	0.1%
U.S. ETF Fails	15.3 bps	3.8%

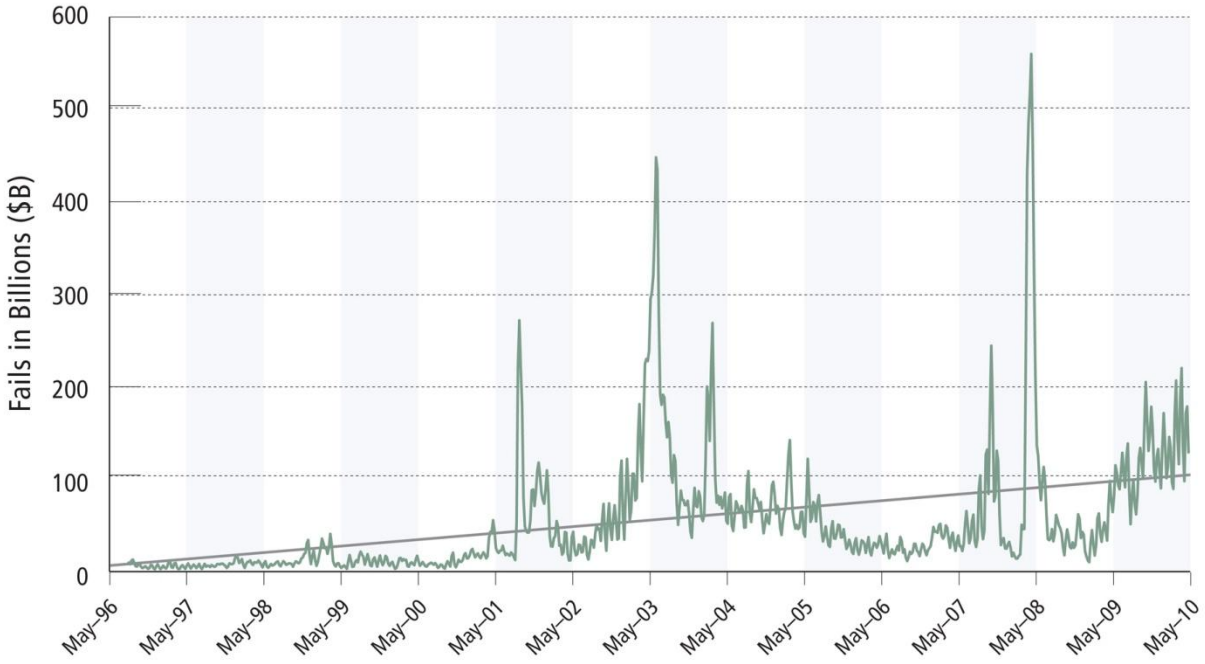
Failed mortgage trades stand out as the major problem, accounting for more than 46 percent of the total mortgage-backed securities issued. In absolute value, $2.6 trillion in mortgage securities failed during 2010. ETFs also stand out because they fail at a rate that is forty times higher than other exchange traded equities (3.8 percent vs. 0.1 percent for equities). This may imply that the main trading firms, which act as agents or intermediaries, are making money on fails of assets owned by others.

Basis Point Group's (BPG) research shows that the delays caused by settlement failures and other accounting recognition delays result in hidden costs to beneficial owners of assets of as much as twenty-seven basis points every day, or about $300 billion in assets that cannot be reinvested. At a conservative annual interest rate of 3 percent, this estimate implies that currently, underfunded pension funds and other

institutional investors are losing $9 billion annually to settlement failures**.** Investors are underwriting this transfer to trading profits on Wall Street as one part of this endemic fail-to-deliver problem being overlooked by regulators.

Basis Point Group tracks market fails using publicly available data going as far back as 1990 for some markets. Figure 2 shows that the trend in fails of all asset types has been steadily increasing since mid-1996. Until recently, Treasuries dominated the fail-to-deliver reports.

Figure 2: Capital Market Fails June 1996 to December 2010



Two things are obvious from this graphic: The pattern of fails is volatile and the level of fails has gotten worse. The grey line shows the trend.[11] Whether the rise in fails is driven by increased trading, collateralization, short-term financing, or simple bad behavior is unknown. We suggest that failures now are at a level that presents significant systemic risk to all investors in the event of another market shock. The Fed, which has the detailed fails data for each primary dealer, does not appear to be using available tools to mitigate this financial risk to the nation's capital markets.

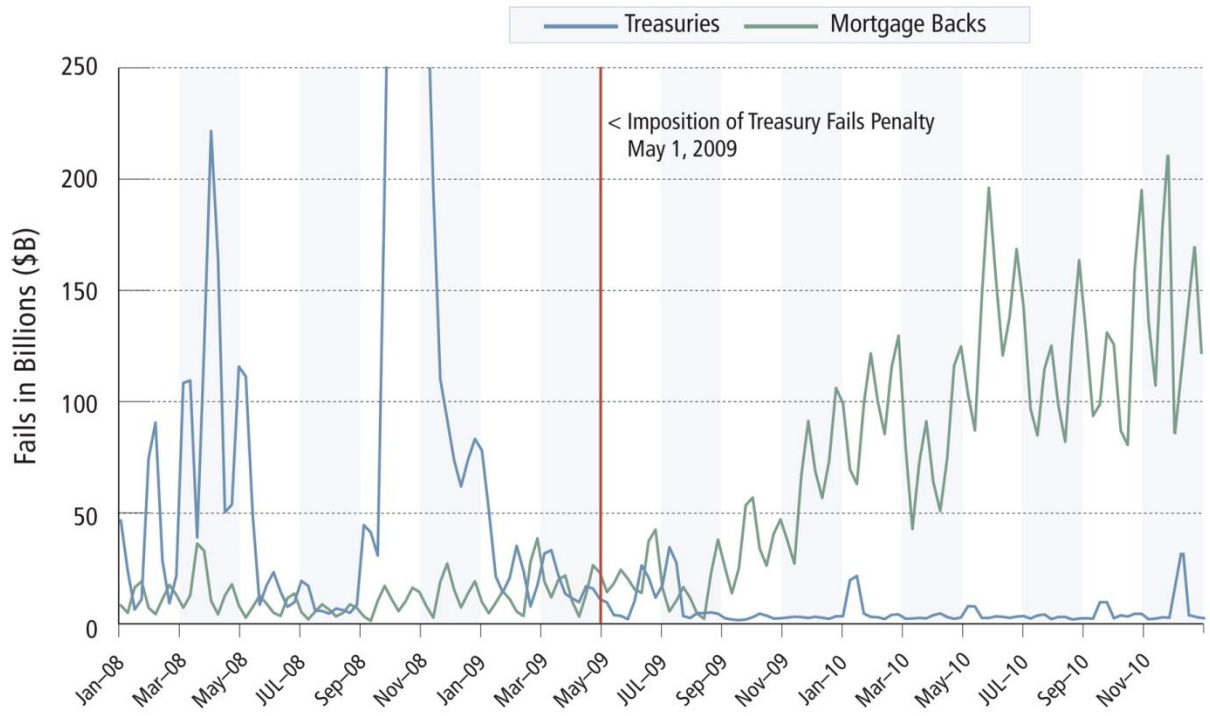
Fails Shift from Stocks and Treasury Bonds to MBS and ETFs

In May 2009, the Federal Reserve placed a penalty on settlement fails of Treasury securities. Figure 3 shows that failures in this market have been virtually eliminated since then.

[11] The trend is calculated as a straight line using standard regression techniques.

Not so with mortgage securities. To the contrary, since 2008, when mortgage failures averaged $10.6 billion per day, failures in this market have climbed steadily, reaching $115 billion per day in 2010.

Figure 3: 2008–2010 Treasury and Mortgage Back Securities Fails



With no penalty for failing MBS securities and with the government takeover of Fannie Mae and Freddie Mac effectively guaranteeing the principal risk by the Treasury, there is little incentive to correct a fail quickly. The Treasury (and by extension the taxpayer) will be obligated to intervene again in the event of another liquidity crisis. Investors and taxpayers who are unaware the game is being played with their funds will be the ultimate losers.

While ETF failures are magnitudes of order smaller than MBS failures, they have the possibility of being the first in a string of dominoes to fall in a crisis. ETFs are highly visible but their failures provide one of the best examples of “things not being as they seem.” ETFs are marketed and sold as exchange traded equity securities that have all the diversification advantages of a mutual fund with unlimited supply and they can be traded (and shorted) throughout the day. Investors have been lulled into the belief that ETFs are just like equities through repeated assurances from brokers and the issuers.

As an example, illiquid small cap companies are being repackaged in index ETFs such as the IWM, which derives its value from the stocks in the Russell 2000 index. Unfortunately, just because they are a component of a heavily traded ETF, the

underlying securities do not suddenly become liquid. The situation is analogous to the packaging of substandard MBS and asset-backed pools in more easily traded securities, which did not magically transform bad mortgages into high quality paper. Wall Street instead obfuscated the risk in a manner that was nearly impossible for the reasonable professional investor to discover. Some ETFs may be manifesting the same problem in a different way. This is the fatal assumption in tightly coupled systems.

Recent events—notably ongoing concerns about sovereign debt in Greece, Ireland, and possibly other European countries and the unrest in the Middle East—reinforce concerns about potential systemic risk. Investors have been sold an idea that they need only hit the "eject" button to escape bad news in the market by selling highly liquid ETFs. As the May 6, 2010 "Flash Crash" demonstrated, selling of ETFs mutates rapidly into the destruction of the value of underlying stocks. The financial crisis of 2008 convincingly demonstrated that risk is contagious: markets with an unexpected failure quickly infect other markets and other asset categories.

We are not the first to highlight the ETF fails problem. Roughly a year before the financial crisis, Professor Jim Angel of Georgetown University warned the SEC that "as of this writing, over 100 ETFs and ETNs are on [the] Regulation SHO Threshold List."[12]

Table 5: U.S. Exchange-Traded Funds—Top 10 ETF Fails (Full Year 2010)

Symbol	Description	Total Value of Fails Reported	# of Days Fails Reported	% Value of ETF Fails	% Value of All Fails
SPY	SPDR S&P 500 ETF TR	$74,770,649,095	248	27.4%	15.3%
IWM	ISHARES RUSSELL 2000 INDEX	$27,542,976,085	249	10.1%	5.6%
QQQQ	POWERSHARES QQQ TR UNIT SER 1	$9,726,205,729	247	3.6%	2.0%
FAZ	DIREXION DAILY FINANCIAL BEAR	$8,917,534,272	247	3.3%	1.8%
FAS	DIREXION DAILY FINANCIAL BULL	$8,615,461,265	245	3.2%	1.8%
XLF	FINANCIAL SECTOR SPDR	$6,316,149,807	240	2.3%	1.3%
XRT	SPDR SERIES TR SPDR S&P RETAIL	$5,645,840,903	240	2.1%	1.2%
XLE	ENERGY SECTOR SPDR	$4,491,801,629	241	1.6%	0.9%
IYR	ISHARES DJ US REAL EST IDX FD	$3,805,037,250	240	1.4%	0.8%
XLI	INDUSTRIAL SECTOR SPDR	$3,762,812,985	233	1.4%	0.8%
	Fails of Top 10 ETFs Reported:	**$153,594,469,019**		**56.3%**	**31.5%**
	Fails of All ETF Securities Reported	**$272,767,713,480**			
	Fails of All Securities Reported	**$488,297,395,379**			

[12] Regulation SHO is a government-mandated report on "hard to borrow" stocks that might command rates as high as 30 percent interest charges per year for a common stock, as in the Tesla Motors example previously cited (see Bradley and Litan, *Choking the Recovery*), before a short seller can transact in the security.

Table 5 shows that in 2010 some of the largest ETFs (SPY, XLF, and XLI) had the highest failure rates, often exceeding 240 out of 250 trading days.[13]

In normal trading environments, liquidity risk is invisible and the instability caused by fails remains unseen below the surface of markets operations. Liquidity risk in equities markets is evident from the extremely high rate at which settlement of ETF buy transactions fail because the stock is not delivered to the owners. Whether failures occur because insufficient units are created or because the short sellers cannot locate someone willing to lend them stock for the trade is irrelevant. Investors have been promised that they can claim their money at a reasonable and immediate value. This may be a promise markets can't keep when the plumbing breaks.

Why Fails to Receive and Fails to Deliver Don't Match

One other consideration should give pause to regulators who might naively assume that market participants are sufficiently well capitalized with access to sufficient liquidity. There is a widely held belief by both audit firms and regulatory officials that failures to receive securities offset failures to deliver. These parties take for granted that the financial system plumbing is in good condition and that all actors in the game behave responsibly and ethically.

This assumption is simplistic and poses potentially dangerous systemic risks. To understand why, consider first two key points that have come out of Basis Point Group's research and other academic research.[14] The first is that the average time to cure a fail is approximately fifteen days. The second is that only 35 percent of fails to deliver are offset by a failure to receive.[15]

The systemic risk issues should be obvious. If dealers fail to settle $130 billion to $253 billion per day and the normal time required to resolve failures is fifteen days, then the Treasury must stand ready to supply $2 trillion or more to the securities markets to keep markets liquid and buy time for market intermediaries to acquire and deliver against their commitments if one or more major counterparties fail, as occurred with Lehman Brothers.

Treasury security fails exceeded 50 percent of the total issuance at the peak of the crisis in 2008. MBS fails are harder to correct, and it is reasonable to expect that in any crisis fails will spike and the liquidity of specific firms may be seriously affected. Equally disturbing is evidence from BPG's research that shows MBS failures persist longer than most other asset types because of the complexity of MBS settlement. BPG analyzed the

[13] "Fails-To-Deliver Data" reported to the SEC by the National Securities Clearing Corporation.
[14] Thomas J. Gjerde, "Naked Short-Selling and Delivery Failure in U.S. Equity Markets" (paper presented at the 66th International Atlantic Economic Conference, Montreal, Canada, October 12, 2008, which found that fails persisted for sixteen days).
[15] BPG's analysis used the criteria that a receive and deliver fail offset each other if they were for the same security, the same par, or shares on the same day.

trading books of one major financial organization and documented that mortgage fails averaged sixty-three days despite firm risk summaries that showed the weighted average settlement delay for fails at only fifteen days.

The foregoing receive-deliver fails offset figures also are concerning because they mean that 65 percent of transactions are 'naked fails.'[16] Institutional Investors have pulled back from securities lending, making it harder for market makers to acquire securities that may have been easily borrowed in the past. Increased trading and financing activity associated with high frequency trading and derivative hedge strategies only worsens the high-quality security supply problem, decreasing the resiliency of the markets and increasing the overall risk to the system.

Finally, there is a lopsided risk-reward dynamic embedded in the structure of current fails regulations. Capital markets firms can increase profits while laying off the risk associated with these profits to investors, the Treasury, and ultimately the taxpayers.

Implications for Regulators

We do not know if regulators are aware of these specific market failure patterns, or their potential causes. It also is unclear which regulators have responsibility for assessing the impact of fails on a firm's liquidity and stability. Consistent with the analysis above, there are two alternative possibilities, or some combination of the two:

1. Regulators are either unintentionally or intentionally allowing parties, most likely sellers of securities, to game the system and squeeze out extra earnings. Failing to deliver a security to one party and re-hypothecating it to another party for a short period of time is one method of generating additional returns. In the case of mortgage securities in particular, it is necessary to ask if this approach might be a deliberate tactic employed by the Fed to allow banks to reflate their balance sheets.

2. Alternatively, rising fails could be canaries in the coal mine of financial markets, telegraphing that parties to ETFs and mortgage-backed securities transactions are having problems completing their trades. Markets for borrowing securities, especially mortgages and those supporting small cap ETFs, may be drying up.

In either case, the regulatory establishment must gain control over Wall Street's hyperkinetic trading interests and stiffly fine traders who do not meet their contractual and legal obligations to settle trades on time.

[16] While the data supporting the 35 percent number is narrow (one month of months data for one anonymous dealer), the analysis included more than 795,000 transactions totaling $7.8 trillion dollars in notional value.

Recommendations

Fortunately, there are several clear and obvious remedies to the fails situation. The appropriate regulatory authorities should:

- Impose substantial penalties or fees for all transaction fails.

  - It worked in equities and for Treasuries: make all financial instruments, and especially mortgage securities and ETFs, face large fines for settlement failure;
  - Put the regulatory onus on the custody banks, the top five of whom control 60 percent of $67 trillion in client assets;
  - Make custody banks post capital sufficient to cover all failed client trades every day;
  - Make penalties sufficiently large that they more than offset any gains parties may realize from not delivering securities or not paying for them by the settlement due date; and
  - Make penalties take varying forms, such as stiff or increasing fines for every day an MBS trade or ETF trade fails to deliver. It is possible that the SEC (for ETFs) and the Fed (for MBS) already may have legal authority to implement appropriate penalties, but if each agency does not believe it does, it should immediately ask Congress for that authority. The rules that govern the timely settlement of securities trades are clear; the enforcement mechanisms appear quite muddy.

- Establish broader fails reporting, and include all transaction activity for systemically important financial institutions, especially primary custody banks, in a manner similar to that required by U.S. Federal Reserve Bank of New York from U.S. primary dealers:

  - Report aggregate dollar value of securities lending pools by asset class on a monthly basis so that investors and regulators might anticipate shifts of the security supply and its implications for market stability (as customers often quit lending at the beginning of serious liquidity crises);
  - Report fails-to-receive securities and stratify by customer segment;
  - Report fails-to-deliver securities and stratify by customer segment;
  - Delineate fails data according to custody bank business lines, e.g. trading, securities lending, and financing (repurchase service); and

Time to Change the Framework for Analyzing Systemic Risk in Financial Markets

There are sufficient data available at the clearing organizations to create a new analytic framework and structure for assessing systemic risk implications of new instruments or trading strategies. Consultants for BPG understand that operations staff at major financial firms have long counseled against many of the more complex, multileg deal

structures. The operational complexity of tightly coupled systems depends on a daisy chain of intermediaries doing the right thing at the right time. This does not often happen during market crisis. Most front office and senior managers may not understand and often ignore the extent of incremental manual labor required to settle complex trades, as in mortgage securities.

Accordingly, regulators must initiate an analysis to determine how transaction fails propagate through the system and how the volumes of collateralization, repo financing, and capitalization affect market prices. Regulators serve an important role in safeguarding investor confidence in capital markets. Today we know that bad behavior and gaming the system based on operational deficiencies imposes a performance penalty on institutional investors and on the nation's taxpayers. We cannot afford to wait until the next crisis to resolve these dangerous and leaky pipes in our financial system.