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The Pandemic *Stress* Test

Triparty & Securities Clearance

The Pandemic Stress Test

Examining the resiliency of US government securities repo and clearance settlement in Q1 2020

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Glossary of Terms

BILATERAL

A transaction in which two counterparties face one another directly. In a bilateral repo, a liquidity provider supplies cash directly to a liquidity seeker in exchange for collateral.

CLEARANCE

The settlement of a US government security. Every time an outright purchase of a security or financing of a security – such as a repo or a securities loan – takes place, that transaction is required to "settle" or "clear."

ON-THE-RUN/OFF-THE-RUN TREASURIES

"On-the-run" Treasury securities are the most recently issued notes or bonds of any maturity. As new securities are issued by the US Treasury, the previously issued notes or bonds go "off-the-run" and typically trade at a discount to new securities. Off-the-run securities represent more than 90% of the US Treasury market and are less liquid than on-the-runs.

REPO

A repurchase agreement transaction in which a liquidity seeker pledges collateral in exchange for cash from a liquidity provider. The transaction may be overnight, for a set term, or open and ongoing. At the conclusion of the trade, the cash and collateral are returned to the original parties, plus interest.

SETTLEMENT FAIL

In a securities purchase, when the seller of the securities fails to deliver the assets to the buyer by the close of business on the scheduled settlement date of a transaction.

TRIPARTY

A method of transacting in which a triparty agent intermediates a trade between two counterparties. In a triparty repo, a triparty agent facilitates a trade between a cash provider and a collateral provider, administering most elements of the transaction.

Introduction

The volatility between late February and early April 2020 was the largest stress event international capital markets have witnessed since the 2007-2009 global financial crisis. Unlike that event, however, in which problems endemic to financial markets developed into a crisis over two years, the shock this time around was a public health emergency, with COVID-19 prompting an economic downturn that proved startlingly swift.

In US equities, the Russell 3000 Index dropped 35% in just 23 trading days. Yields on US government securities collapsed even faster as panicked investors sought safety. The 10-year Treasury yielded 1.56% on February 19 but just 0.31% by March 9, an all-time intraday low, while liquidity in off-the-run Treasuries – which account for the vast majority of the US government securities – dried up completely.[1]

The distress was even more acute in securitized assets. Liquidity all but evaporated in the commercial mortgage-backed securities (CMBS) market due to concerns over the future prospects for commercial real estate,[2] with similar pressures causing liquidity to seize up in real estate investment trusts (REITs) holding agency mortgage-backed securities (MBS).[3]

Amid this widespread anxiety, US repo markets came under pressure. As market participants rushed to access cash and certain high-quality liquid assets (HQLA), triparty repo spreads widened out markedly in early to mid-March, with particular demand appearing for term financing.

Swift intervention by the Federal Reserve to provide liquidity and restore confidence started to calm the situation by early April, and by mid-June, spreads for credit and equity repo had essentially tightened back to their pre-March levels.

Repo markets were thoroughly tested by the events of Q1 2020, but supported by the Fed's actions, US markets continued to function, albeit with considerable pressure evident in widening repo spreads.

In Part One of this paper, we shall present internal BNY Mellon data that reveal new insights about the performance of US triparty repo and US government securities settlement during this stress period, informed by the role our firm plays in this important sector.

Part Two offers our perspective on the current resiliency of these markets, which were structurally enhanced in the wake of the last crisis and thus better equipped to cope with the volatility of March 2020.

1. Chavez-Dreyfuss, Gertrude. Fed's big move could help U.S. Treasury liquidity, but effects may not last long. *Reuters* (March 23, 2020).
2. Mooney, Jake, Hudgins, Chris. Coronavirus jolts CMBS pricing and 2020 issuance expectations. *S&P Global Market Intelligence* (April 9, 2020).
3. Lash, Herbert. Mortgage securities rebound as Fed starts buying, concerns persist. *Reuters* (March 30, 2020).

PART ONE

Repo Markets in February & March 2020

Financial markets were operating well as recently as the second week of February 2020.

February 19 saw record high closings for two of the three major US equity indices. The main fixed-income benchmark, the Bloomberg Barclays Aggregate Index, was also seeing spreads that were near all-time tights, reflecting similarly benign conditions in the bond markets.

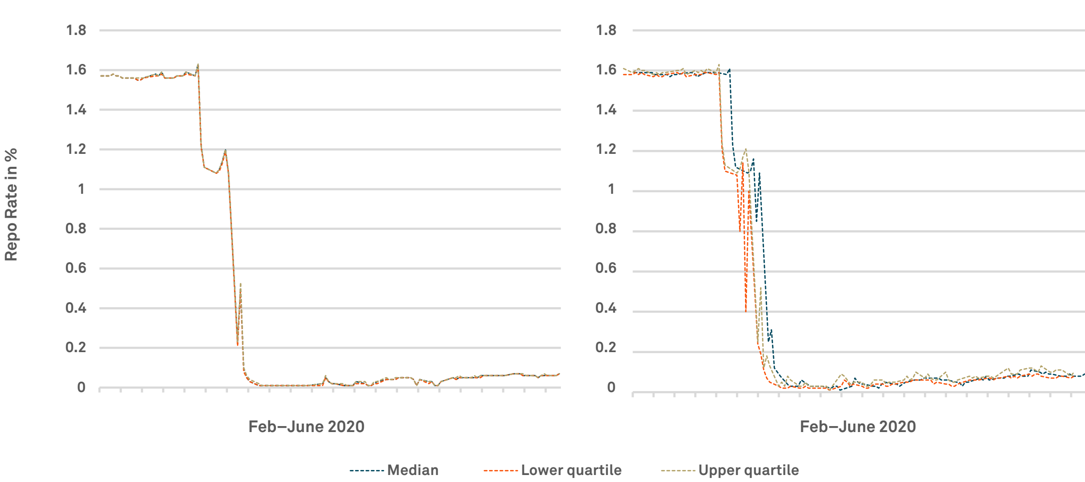
In currency markets, traders had observed record-low option-implied volatility in foreign exchange (FX) during January.

All was also calm in US repo markets. According to BNY Mellon triparty repo data, rates for both overnight and term repo[4] funding collateralized by US Treasuries were holding close to one another at around 1.6%.

FIGURE 1: STEADY STATE

The backdrop to the COVID-19 sell-off saw narrow spreads in US repo markets, for both overnight and term funding through mid-February, followed by rate dispersion emerging in term repo in March

Repo Rate Distribution for Treasury, Overnight | **Repo Rate Distribution for Treasury, Term**



Source: BNY Mellon

This was predominantly the result of the very flat money market curve prevailing at that time, reflecting market expectations that the Fed would leave interest rates unchanged for the remainder of 2020. Given a static rates policy outlook, overnight funding and term funding were trading near the same levels. It is also notable that while US equity markets were already beginning to sell off in the last week of February, no evidence of any similar investor anxiety is observable in our triparty repo data.

Pressure was building elsewhere in the funding markets, however.

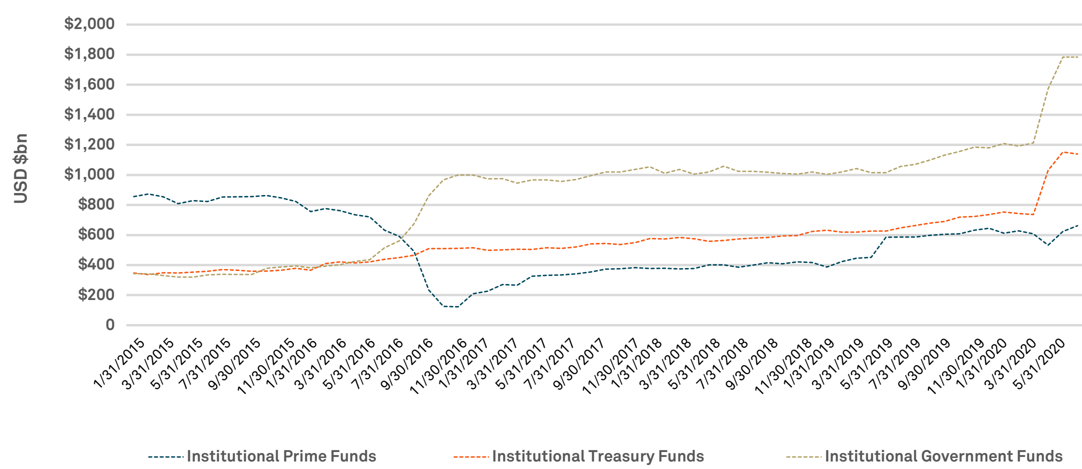
4. The majority of US repo activity is overnight funding. Term repo can range from seven days in duration to 90 days or longer. To control for small-sample bias, we have elected to group term repo as a single category for the purposes of this analysis.

As our colleagues in BNY Mellon Investment Management's Global Economics and Investment Analysis Group wrote in their June 2020 *Points of View*: "As the extent of the economic hit from COVID-19 in early/mid-March became clear, funding conditions tightened significantly. Corporates sought as much liquidity as possible in the market, at a time when investors shifted away from prime money market funds into government money market funds to reduce their risk exposure. Prime funds sought to reduce their commercial paper and certificate of deposit holdings to raise cash and build liquidity buffers in response to actual and expected investor outflows."[5]

FIGURE 2: BY POPULAR DEMAND

Assets in US government money market funds increased as investors sought liquidity

US Money Market Fund Balances, January 2015–June 2020



Source: Crane Data

Figure 2 amply demonstrates the velocity of the inflows into cash-equivalent investments during the first half of 2020. US government money market fund balances (combining retail and institutional government and Treasury funds) climbed from $2.75 trillion at the end of February to more than $3.9 trillion by the end of April, where they remained at the end of May.

Given the important role that US government money funds play in providing cash in US triparty repo, this inflow of balances would prove a meaningful factor in the availability of liquidity for market participants seeking access to cash in the weeks to come.

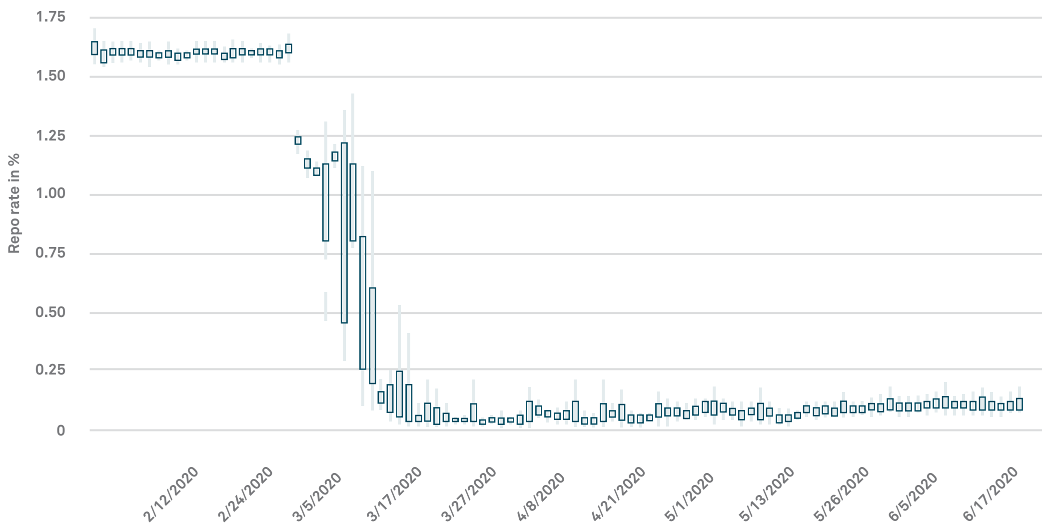
The first sign of volatility in repo emerged in early March. We observed pressure in the term repo market, and consequently, for the purposes of this paper, we will focus our analysis mainly on the term segment of the market.

5. Global Economics and Investment Analysis Group, BNY Mellon Investment Management. Issues in Funding Markets During the COVID-19 Crisis. *Points of View* (June 2020).

FIGURE 3: TERM REPO SPREADS WIDEN[6]

Tight US Treasury term repo rates expanded in early March as the Fed announced emergency rate cuts and the search for liquidity intensified

Repo Rate Distribution Treasury, Term



Source: BNY Mellon

While dispersion in term Treasury funding had held tight in the 1.6% range through February, following the Fed's 50 basis point (bps) rate cut on March 3, spreads began to widen. As Figure 3 shows, over the following weeks dispersion became apparent, with some cash seekers securing term funding for less than 50bps while others were paying more than twice that rate.[7]

The demand for funding was also driving record dealer balances.[8] By March 16, US balances had exceeded $2.4 trillion, well above the average of around $2 trillion observed over the prior year. March 27 saw balances hit $2.49 trillion, the highest daily dealer balance in the history of BNY Mellon's triparty platform.

The extent of repo market volatility was also manifesting itself on the clearance and settlement side of US government securities, in the form of rising Treasury and MBS settlement fails.

A settlement fail occurs when a seller fails to deliver securities to a buyer by the close of business on the scheduled settlement date of a transaction.[9]

Fails can occur for a number of reasons, but most frequently they are caused by operational problems, including miscommunication, or are due to economic incentives. For example, if the cost of borrowing securities breaches a certain threshold, that may be a compelling incentive to let the settlement fail.

6. A box plot is a method for graphically depicting groups of numerical data through their quartiles. The box extends from the first to third quartile values of the data, with a line at the median (the second quartile). The whiskers extend from the edges of the box to show the range of the data. Outlier points have been suppressed in these charts.

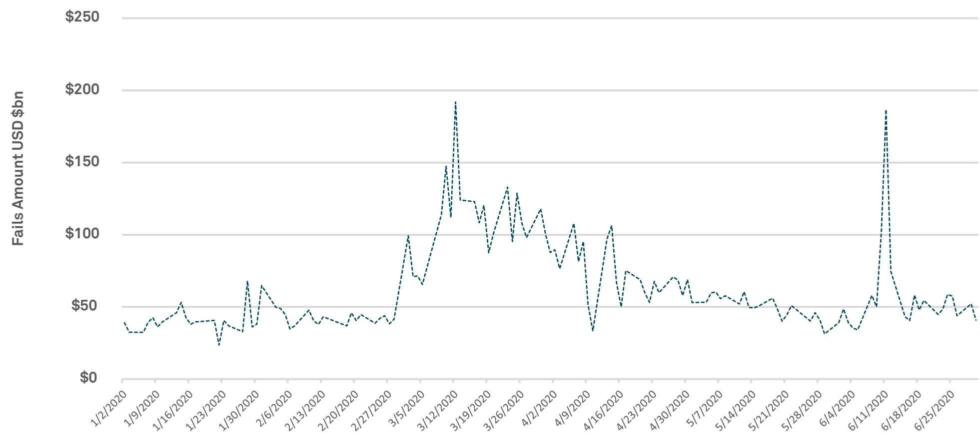
7. Term repo transactions of different duration have been commingled for the purposes of this analysis.

8. References to "dealer balances" in this paper refer to all dealers on BNY Mellon's triparty and securities clearance platforms, unless otherwise stated.

9. In this paper, we focus specifically on delivery-versus-payment (DVP) settlement fails, alternatively known as clearance fails.

FIGURE 4: SETTLEMENT FAILS INCREASE AMID VOLATILITY

The bilateral settlement of US Treasuries is sensitive to market liquidity, tending to experience higher fail rates during periods of market volatility and illiquidity



Source: BNY Mellon

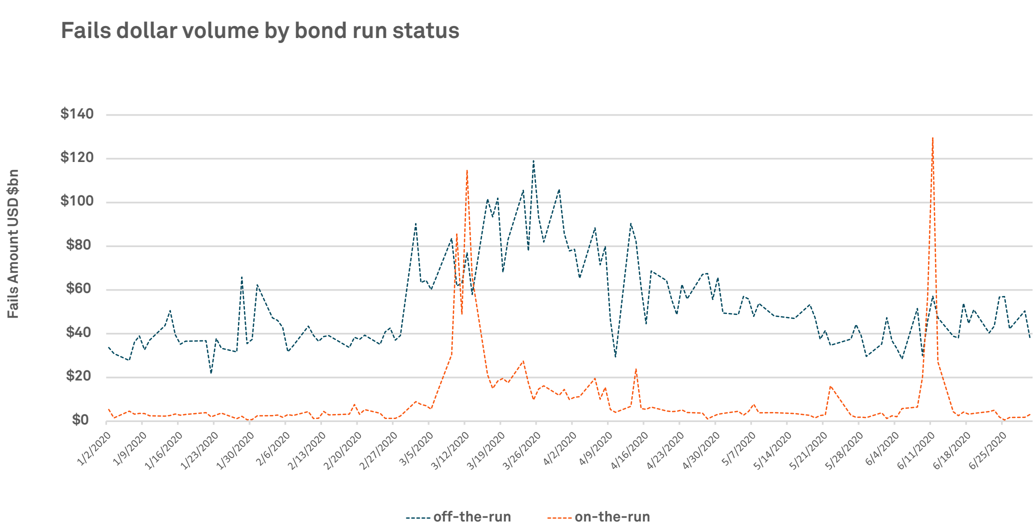
Settlement fails tend to happen for different reasons in different asset classes. In agency MBS, for example, fails occur around the settlement date for "to be announced" mortgages, while in inflation-linked bonds, they are predominantly operational in nature.

As Figure 4 demonstrates, fails in the bilateral US Treasury market rose sharply in March 2020, hitting a high of $192 billion on March 12, more than double the volume witnessed at the start of the month. The June 11 Class A settlement date for agency MBS also witnessed an unexpected increase in fails, particularly in the settlement of 10-year Treasuries. This outlier, unrelated to COVID-19, is also observable below in on-the-run fails in Figure 5.

Focusing in on the first half of 2020 in particular, we can get a better sense of the actual settlement fails activity by type of Treasury security.

FIGURE 5: OUT WITH THE OLD, IN WITH THE NEW

Illiquidity in off-the-run Treasuries caused an increase in bilateral settlement fails in March. Once the Fed intervened to provide liquidity, off-the-run fails dropped and on-the-run fails climbed



Source: BNY Mellon

Figure 5 shows how at the onset of volatility in early March, we observed a spike in Treasury fails across the board on our US government securities clearance platform. Significantly, however, the first spike occurred in off-the-run Treasuries.

Off-the-runs have been observed to fail more frequently than on-the-runs, both because they are less liquid and because there are substantially more CUSIPs in this category – hundreds, compared to on-the-run securities, which trade under just five CUSIPs.

That is what we saw in early March: a short-lived rise in off-the-run fails, with the bilateral settlement fails then rapidly increasing in on-the-run bonds. This is because demand in the market tends to shift toward on-the-runs during volatile periods since they are the most liquid, high-quality securities available.

The Fed Intervenes

March 17 saw the Fed announce a revival of its Primary Dealer Credit Facility, a 2008 tool through which the central bank provides funding overnight and on a term basis directly to borrowers.[10]

The Fed followed this on March 23 with an arsenal of additional measures designed to arrest collapsing asset values, inject liquidity into markets and restore confidence. These included expanding its commitment to buying US Treasuries and agency MBS and establishing new facilities to provide direct liquidity into the markets for asset-backed securities, money market funds and commercial paper.

The efficacy of these measures in calming markets soon became apparent. In addition to a sharp drop in bilateral settlement fails, term triparty repo rates began to fall, with median Treasury term rates dropping from around 40bps the week before the Fed facilities were announced to just north of 20bps in the two weeks after (see Figure 1).

While noticeable dispersion remained in term spreads, these also began to come in by early April and continued to tighten during May. By mid-June, Treasury triparty term repo spreads had essentially narrowed back to where they had been in February before the crisis.

The story was the same in dealer triparty repo balances, which dropped below $2 trillion on June 4 and had fallen to $1.8 trillion as of June 30.

The worst of the stress had passed, and thanks to unprecedented support from the Fed, markets were stabilizing.

In the next section of this paper, we will take a closer look at some of the structural elements of the US financing markets in order to gain a better understanding of exactly how much capacity to absorb additional pressure is currently built into the system.

10. BNY Mellon Investment Management. *Credit Health Check Amidst COVID-19 Pandemic* (June 2020).

PART TWO

The Resiliency of US Triparty Repo and Government Securities Settlement

Market participants that turned to repo markets for funding in March encountered a marketplace that was experiencing pressure, but the repo settlement mechanism remained functional.

Despite the illiquidity observed in off-the-run Treasuries, widening repo spreads and increasing bilateral settlement fails, aided by the additional liquidity provided by the Fed, repo markets continued to operate.

The sustained provision of financing, even amid challenging conditions, was the result of significant reforms and infrastructure investments that have made repo markets, and triparty repo in particular, more robust in recent years.

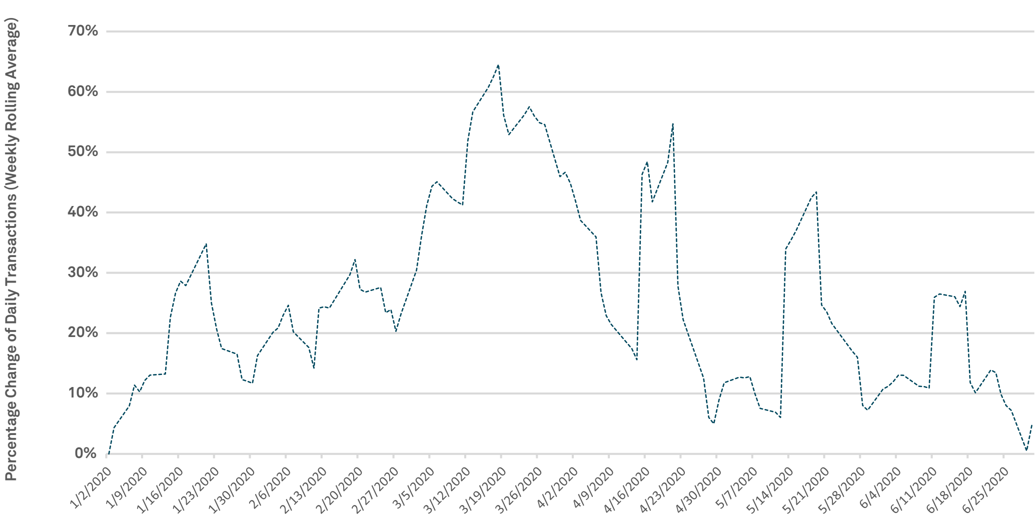
New Records

The recent volatility in markets not only drove dealer triparty repo balances to all-time highs, it also exceeded previous overall clearance volume records in US Treasuries and agency MBS.

FIGURE 6: ALL CLEAR[11]

Clearing activity in Fed-eligible securities soared in mid-March as above-average volumes of securities changed hands

Daily Clearance Transaction Volume % Change, Jan–June 2020



Source: BNY Mellon

Clearance data illustrates the sheer volume moving through the US government securities market and how the velocity of securities trading increased in mid-March.[12] For example, the number of settled transactions in the market increased 64.5% between January 2 and March 18, 2020.

11. Figure 6 encompasses all clearance transaction volume by all platform participants and across all securities types.

12. BNY Mellon clearance data only captures a portion of overall settlement activity. US government securities also clear at other venues, including the Depository Trust & Clearing Corp (see *The Role of Cleared Repo*).

Total clearance volumes in recent months have actually exceeded the activity recorded at the height of the COVID-19 crisis in March. Figure 6 shows spikes in total clearance activity around the April 15 and May 13 settlement dates for Class A agency MBS that set new records for the total number of transactions cleared in a single day.[13]

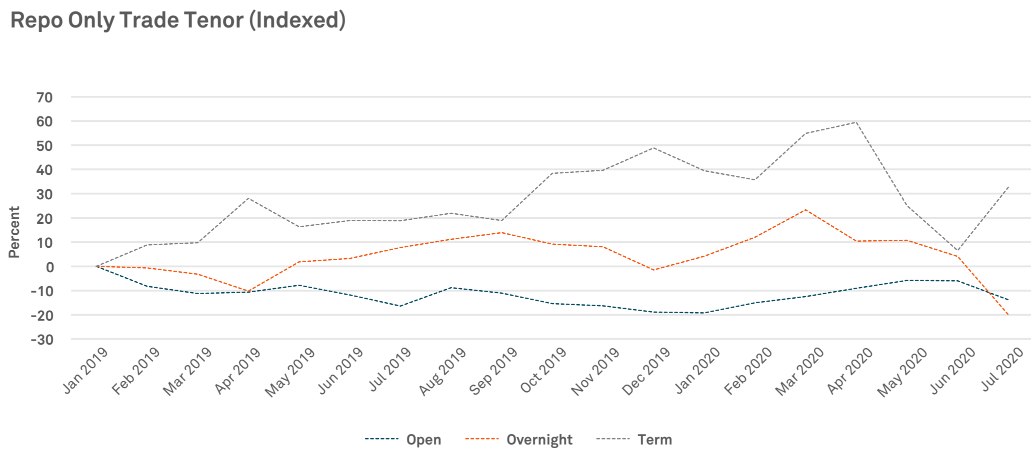
The Stabilizing Role of the Fed

The Fed took swift and decisive action to stabilize the US financial system during March and April. Its decision to launch a range of credit facilities to extend cash to dealers in exchange for non-Fed-eligible collateral was a crucial pressure valve.

As discussed in Part One, on some days at the height of the volatility, intraday dispersion on term triparty repo was as wide as 90bps when it had been as little as 2–3bps just weeks earlier (see Figure 3). The supply of term funding was also limited by restrictions on the duration of investments into which money market funds could enter.

FIGURE 7: THE THREE TENORS[14]

A marginal uptick in US term triparty repo transactions was observed in the first quarter



Trade Tenor	2019 Average	2019 % of Total	2020 YTD Avg	2020 % of Total
Open	$155bn	8%	$154bn	8%
Overnight	$1,085bn	57%	$1,117bn	56%
Term	$653bn	34%	$727bn	36%

Source: BNY Mellon

With most money funds unable to offer term financing beyond seven days, the inability to lock in longer duration funding emerged as a potential issue in US repo markets. As Figure 7 shows, demand for term funding spiked noticeably among primary dealers in March and April, only to quickly tail off in May as Fed liquidity facilities came in to fill the void and as demand for term began to moderate.

The Fed was also instrumental in keeping the available supply of HQLA steady through its Overnight Reverse Repo Facility, which takes cash from money market funds and other cash providers in exchange for the central bank's own stores of Treasuries.

This facility emerged as an important option for money funds awash with investor cash in mid-March. While not used every day, the facility nonetheless represents another important safety valve in the system.

13. Figure 6 depicts weekly rolling averages in percentage change terms. Although the weekly rolling average percentage change was higher in late March— accounting for the higher spike—new single-day clearance records were broken in April and May.

14. Data in Figure 7 is taken from primary dealer activity on BNY Mellon's triparty platform.

The Role of Sponsored Cleared Repo

Another important recent development in US funding markets has been the emergence of sponsored central clearing for repo transactions and the beneficial role such intermediaries have played in widening access to financing.

Cleared repo has been a feature of the US repo market since the Depository Trust & Clearing Corporation (DTCC) launched a cleared product in the mid-1990s. DTCC introduced sponsored cleared repo in its Fixed Income Clearing Corporation (FICC) clearinghouse in 2005. The service enabled members of the central counterparty to sponsor clients into cleared repo trades, but for many years, activity at FICC was focused predominantly on sweeping cash left unallocated at the end of the day into repo overnight.

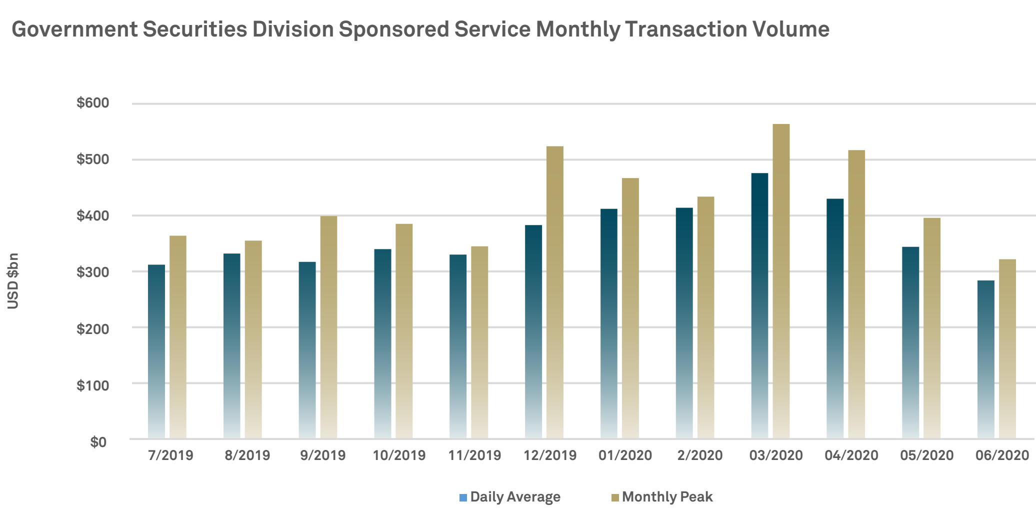
A number of forces have coalesced to increase utilization of sponsored cleared repo in recent years, however. These have included changes to broaden the number of registered investment companies that are treated as qualified institutional buyers able to be sponsored into FICC and more participation by clearinghouse members that wish to act as sponsors for their clients.

As dealers pulled back from repo in the years after the global financial crisis, much of their former intermediation role has been assumed by sponsors routing their clients' repo flow into central counterparties like FICC.

As a clearinghouse, FICC sits in between two repo counterparties, facilitating trades that would otherwise not be possible between parties due to mandate constraints or other factors. For example, a money market fund cash provider would not be able to enter a repo with a hedge fund bilaterally, but with both parties facing FICC instead of each other directly, liquidity and collateral is able to pass between the funds.

FIGURE 8: ROOM TO MANEUVER

DTCC government securities sponsored cleared repo volumes rose sharply during the COVID-19 crisis



Source: DTCC

Cleared repo volumes at FICC have been climbing steadily over the past two years, partly due to the sponsored membership model, which enables the client to enjoy the benefits of facing a clearinghouse but without the obligations of full membership, such as making default fund contributions.

Figure 8 shows total sponsored cleared repo volumes transacted by DTCC in the 12 months to June 2020. Volumes reached new all-time highs in March 2020, with $564 billion transacted during the peak day of that month, with a daily average of $476 billion in sponsored volume.

Moving forward, the role of sponsored repo is only anticipated to grow, especially after the events of March and April. Had facilities such as FICC not been in place, the reduced capacity of bilateral repo markets would have significantly impeded the ability of cash and collateral providers to transact with one another, increasing pressure in the market.

For their part, broker-dealers will also likely be content to see more repo move out of the bilateral world and into FICC, enabling them to dedicate their balance sheets to activities with higher returns on equity.

Other Repo and Securities Settlement Enhancements

Beyond these large structural enhancements to repo, funding markets have also benefited from a number of more nuanced – but equally important – changes that have been introduced in recent years.[15] These include:

Settlement Fails Analytics: Market participants can utilize machine-learning-based analytics that help predict Fed-eligible securities settlement fails two hours before they occur.

Term Funding: Regulatory changes instituted since 2008 have encouraged market participants to move away from overnight funding to embrace more term transactions.

Robust Settlement: Improving latency around settlement has reduced processing times that leave counterparties exposed to credit risk if collateral is not returned by set deadlines.

Collateral Accessibility: Counterparties are now able to access collateral during repo in order to substitute assets or perform other actions.

Greater Counterparty Diversification: Borrowers now engage with a much wider universe of repo counterparties, reducing risk from relying on a small coterie of cash providers.

Network Efficiencies: Clearance of US government securities is highly centralized, allowing market participants to realize meaningful trading efficiencies.

Enhanced Transparency: Market participants are receiving more data from triparty agents around settlement and fails, allowing them to benchmark their performance against peers.

Digitization: Collateral optimization tools are enabling participants to deploy assets more effectively to achieve their investment goals.

15. The Federal Reserve Bank of New York has led industry efforts to strengthen the resiliency of triparty repo. Detailed information on the work the New York Fed has undertaken in this capacity can be found on its Triparty Repo Infrastructure Reform webpage: https://www.newyorkfed.org/banking/tpr_infr_reform.

Conclusion

While enduring some significant pressure during the worst of the COVID-19 market volatility, US triparty repo and US government securities settlement continued to operate without major disruption. That said, the episode did expose some surprising realities.

For instance, repo rate dispersion indicates demand for term financing was significantly outstripping supply in mid-March, suggesting that market participants may seek longer-term funding in the future, particularly during periods of heightened volatility.

The abrupt reduction in liquidity in off-the-run Treasuries, commercial paper and other previously unimpaired asset classes also proved unexpectedly swift. There may be insights to be gained from a deeper analysis into how these events played out and how liquidity provision can be maintained during future stress events.

There is also much about which to be positive. Recent market-led enhancements to US funding markets, such as triparty reform and the growth of sponsored cleared repo, played an important role in ensuring that the market was well equipped to absorb the unprecedented demand it encountered in Q1 2020.

Ultimately, the infrastructure underpinning US government securities settlement and triparty repo bore the challenges posed by the COVID-19 volatility robustly. The market can also draw confidence from the proactive response of the Federal Reserve: its prompt action to arrest deteriorating liquidity across asset classes was vital in stopping an acute period of market stress developing into a more serious and longer-lasting economic downturn.

About the Author

Brian Ruane is the Chief Executive Officer of BNY Mellon Clearance & Collateral Management and is a member of the BNY Mellon Executive Committee.

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