

The Repo Market is Changing (and What Is a Repo, Anyway?)

The market for repurchase agreements has repeatedly adapted to changing circumstances

BY JOHN MULLIN

On March 17, amid the market turbulence caused by the coronavirus pandemic, the Fed reintroduced its Primary Dealer Credit Facility, or PDCF. The Fed had first created the facility during the 2007-2008 financial crisis to alleviate severe strains in the “repo” market. While mostly invisible to the public at large, the repo market plays an important role in the transmission of monetary policy. It is also a critical source of financing for nonbank financial firms, including securities brokerage houses and real estate investment trusts that specialize in mortgages. (See table.) At the end of 2019, financial firms relied on the repo markets for over \$4 trillion in borrowed funds to support their activities. The renewed PDCF is designed to make loans to primary dealers of U.S. Treasury securities, who are positioned to channel liquidity to repo markets in what policymakers expect to be a difficult economic environment.

The repo market had shown signs of strain even before the onset of the pandemic — but these difficulties appear to have been rather technical in nature and unrelated to fears of imminent recession. On Sept. 17, 2019, repo market interest rates spiked dramatically higher. This precipitated a great deal of concern and discussion among market participants and policymakers. Initial explanations for the rate spike focused on U.S. Treasury financing operations in the aftermath of a period in which the Fed had substantially contracted the reserves of the banking system. But the discussion soon gravitated toward the roles played by some of the major policy changes that had been implemented in response to the financial crisis. These included changes in the Fed’s monetary policy operating framework and changes in bank regulatory and supervisory policies, especially in the area of bank liquidity management.

Taking a long-term perspective, it is hardly surprising that the functioning of repo markets changed in response to the financial crisis. Throughout the post-World War II period, repo markets have repeatedly adapted to changing circumstances.

A Market Evolves

At a very basic level, a repurchase agreement is a loan secured by collateral. Collateralized loans are nothing new, of course. They go back at least as far as ancient Greece and take a variety of different forms — two everyday examples include real estate loans secured by property and loans on cars subject to repossession. The contractual

conventions and market structures associated with collateralized loans vary depending on the type of collateral, and they evolve over time in response to changing market conditions. This is particularly true for the repo market — where today’s market arrangements are different in many important respects from those that existed in the immediate aftermath of World War II.

The U.S. repo market greatly increased in size and importance as inflation accelerated in the late 1970s and early 1980s. This rapid growth was spurred by a process that is referred to by economists as “disintermediation.” As short-term interest rates increased during the period in response to increased inflation, banks could not respond by increasing the deposit rates they offered to their customers because checking deposit rates were capped by the Fed’s longstanding Regulation Q. A growing disconnect between capped bank rates and increasing market rates created an incentive for institutions and individuals to bypass banks. Through this process of disintermediation, many institutions began to channel money directly to the repo market, while other institutions and individuals invested in money market mutual funds, which in turn channeled money to the repo market.

As the repo market grew in the early 1980s, a series of bankruptcies highlighted a number of legal and structural problems that needed to be sorted out. Prior to this period, there had been a great deal of ambiguity about the legal status of repo transactions. Most notably, there was a widespread presumption that repos were unlike other collateralized loans in one crucial respect: They were thought by many to be exempt from the bankruptcy code’s automatic stay provision. This was a technical assumption that made a big difference because an exemption from the automatic stay provision would imply that repo collateral would not become tied up in bankruptcy proceedings of indeterminate length and that repo lenders would be able to sell the collateral immediately in the event of a default.

Yet prior to the 1980s, this assumption had never been put to a definitive test. It took a default episode and an act of Congress to resolve the ambiguity. When a small broker-dealer named Lombard-Wall filed for bankruptcy in August 1982, the court overseeing the case declared that the firm’s repo liabilities would be treated as collateralized loans and therefore would not be exempt from automatic stay provisions. The court issued a temporary restraining

Nonbank Financial Firms are Big Repo Borrowers

Top categories of net borrowers and lenders (in billions of dollars)

	Gross Borrowing	Gross Lending	Net Borrowing (Net Lending)
Net Borrowers:			
Mortgage Real Estate Investment Trusts (M-REITs)	\$379	-	\$380
Securities Broker-Dealers	\$1,755	\$1,396	\$359
Foreign Banking Offices in the U.S.	\$531	\$372	\$159
Net Lenders:			
Money Market Mutual Funds	-	\$1,175	(\$1,175)
U.S.-Chartered Banks	\$128	\$334	(\$206)
State and Local Governments	-	\$141	(\$141)

NOTE: Figures are as of December 2019. SOURCE: Federal Reserve Board Flow of Funds Statistics via FRB website

order prohibiting the firm's repo creditors from selling the collateral backing the firm's repos. This caused a great deal of anxiety among private market participants and regulators alike, who were concerned that the court's rulings might discourage repo lending and substantially damage the availability of credit on the repo market, particularly during periods of heightened financial market uncertainty. In 1984, following a vigorous lobbying campaign by Wall Street firms that was joined by Fed Chair Paul Volcker, Congress enacted legislation that exempted repos on Treasuries (and other select securities) from the automatic stay provision of the bankruptcy code.

A further series of defaults in the 1980s encouraged another major structural change in repo markets — the ascendance of the tri-party repo market. It turned out that, for repo lenders, it was one thing to have the legal right to sell collateral in the event of a default, but it was quite another to have access to the collateral in order to be able to sell it. For example, after Lion Capital Group filed for bankruptcy in 1984, repo creditors ended up recovering only about three-quarters of the value of their loans because the collateral available to back the loans ultimately proved to be insufficient. What was needed was a mechanism to ensure that the collateral backing repo loans would be fully available to creditors in the event of default.

The tri-party repo market — which had been pioneered by Salomon Brothers in the late 1970s — provided just such a mechanism. In the tri-party market, repo collateral is earmarked and held in custody by an agent bank. Repo lenders are protected because they can access and sell collateral in the event of a borrower's default; repo borrowers are protected because they can secure access to the collateral that they have pledged once they repay their loan. The tri-party repo market grew rapidly from the 1980s onward and ultimately accounted for the majority of repo market activity for large government securities dealers.

The Financial Crisis

Repo markets played a prominent role in the 2004-2007 real estate boom and the ensuing financial crisis. In just four years, between December 2003 and December 2007, the asset-to-equity ratio of U.S. broker-dealers ballooned from 24:1 to 35:1. And this balance sheet expansion relied heavily on repo borrowing.

Lehman Brothers, in particular, relied heavily on the tri-party repo market to finance its securities inventory, which ended up being dangerously concentrated with illiquid mortgage-backed securities. By mid-2007, market participants had become concerned about Lehman's leverage as well as the quality of its asset holdings, and the firm's management embarked on a campaign to reduce the firm's leverage. But Lehman found itself with a dilemma. It was loath to raise equity capital, because firm management thought that would send a bad signal to the markets. But it found that reducing leverage through asset sales was just as problematic, because it could not sell assets without booking losses — and the recognition of those losses would seriously undermine the collateral value of the firm's remaining assets, which it relied on for repo market financing.

Although Lehman continued to present itself as solvent in its quarterly financial reports, market observers became increasingly skeptical. In addition to questionable asset valuation methods, it was later discovered that the firm had misrepresented its leverage by improperly pushing certain repo liabilities off its balance sheet at the end 2007 and in early 2008. After Bear Stearns was shuttered in March 2008, market participants became even more concerned about a run on Lehman Brothers. The firm finally declared bankruptcy in September 2008 — an event that seriously strained financial markets.

The runs on Bear Stearns and Lehman highlighted the risk that highly leveraged firms face from collateral "fire sales" — the risk that the forced liquidation of asset

holdings can dramatically depress the market prices for collateral and thereby set off a vicious cycle that culminates in a run. This risk is greatest when a firm's assets are risky, opaque, and therefore illiquid — a description that fit much of the two firms' holdings of mortgage-backed securities.

The tendency toward a vicious cycle appears to have been amplified in the tri-party repo market by lenders' behavior in the face of declining and uncertain collateral valuations. Several studies have examined the discounts — known as “haircuts” — that tri-party repo lenders applied to reported collateral valuations as the crisis unfolded. A well-known 2010 study by Adam Copeland, Antoine Martin, and Michael Walker of the New York Fed found that lenders in the tri-party repo market generally did not increase collateral haircuts in response to increased counterparty risk during the financial crisis. Rather, lenders were more inclined to require higher-quality collateral or deny lending altogether. This behavior likely contributed to the precipitousness of the Bear Stearns and Lehman collapses.

A great deal of risk was rooted in the tri-party market's structure. The U.S. tri-party repo market was dominated by two clearing banks, BNY Mellon and JPMorgan Chase. According to regular practice, all tri-party repo contracts (even multiday contracts) would be unwound on a daily basis — meaning that collateral would be shifted back to a borrower's securities account at its clearing bank and cash would be shifted back into the lender's cash account at the same clearing bank. This had the advantage of giving borrowers maximum flexibility to use their collateral intraday, but it had the disadvantage of regularly leaving clearing banks with huge intraday exposures to repo borrowers. It was not uncommon for a single broker-dealer to owe its main clearing bank more than \$100 billion intraday.

This feature of the tri-party repo added an additional layer of complexity to a risky game. In the midst of the crisis, repo lenders not only had to be wary of other repo creditors quickly exiting the market and leaving them “holding the bag,” they also had to be wary of clearing banks deciding not to execute the daily unwind, which could leave repo lenders similarly exposed.

“Repo lenders are not interested in taking possession of collateral, and if they think they are going to be left holding it, they will say ‘No, I won't lend to you,’” says Richmond Fed economist Huberto Ennis, who has studied strategic behavior in the tri-party repo market. “And if they think that the clearing bank is not going to unwind the next morning, they are going to be happy holding onto their cash and losing one night's interest.”

Post-Crisis Reforms

The Task Force on Tri-Party Repo Infrastructure, which was formed to explore the market's problems, urged a number of changes to lower risk. In accord with task force recommendations, the clearing banks discontinued the daily unwind for nonmaturing loans. In addition, they

substantially reduced their extension of intraday credit.

The crisis also led to major changes in monetary policy that fundamentally affected the functioning of repo markets. “The Fed's old system had been to target the federal funds rate by doing small, but regular, repo lending operations to adjust the supply of bank reserves,” says William English of Yale University. “But this wasn't going to work anymore under quantitative easing. What ended up working, at least at first, was paying banks a set rate of interest on their reserves.”

Before the financial crisis, the Fed had seldom borrowed funds in the repo market by engaging in what are called “reverse repos.” But this changed in 2014 after the Fed's acceleration of quantitative easing caused short-term interest rates to decline below the rate the Fed paid banks on their reserves. At that point, the Fed created the Overnight Reverse Repurchase Agreement Facility to stand ready to borrow funds from certain firms, including mutual funds, at a set rate. This helped the Fed reestablish a floor for market rates. Under this new system of interest rate targeting, which combined paying interest on bank reserves with the reverse repo facility, the Fed largely refrained from repo market lending — this is, until September 2019.

The financial crisis also gave rise to changes in bank regulation and supervision. Perhaps the most consequential changes for repo markets pertained to supervisory guidance and the use of stress tests.

Rate Spikes of Sept. 17, 2019

Prior to September 2019, it had become quite unusual for the benchmark interest rate for repos, known as the Secured Overnight Financing Rate (SOFR), to vary widely from the rate that the Fed paid banks on their excess reserves (IOER). During the year prior to Sept. 17, 2019, the SOFR-IOER spread had become somewhat more volatile as the Fed had continued to reverse its quantitative easing program and reduce the supply of banking system reserves. But the spread had exceeded 0.25 percentage points only five times during the period and had never exceeded 0.75 percentage points. (See chart.)

Thus, it came as a shock to market participants when, on Sept. 17, the SOFR benchmark repo rate spiked to 5.25 percent even though IOER stood at only 2.1 percent.

Initial accounts of the repo rate spike focused on the closely proximate occurrence of a Treasury securities auction and a due date for quarterly corporate tax payments. Both of these events involved large payments from the private sector to the U.S. Treasury's general account at the Fed. Such transactions, if not offset by Fed open market operations or discount window lending, reduce banking system reserves at the Fed and thus tend to reduce the banking system's supply of funds to the repo market. The Treasury auction had the further effect of increasing the demand for funds in the repo market by securities dealers looking to finance Treasury securities purchases.

These factors would tend to put upward pressure on repo rates, but it was puzzling afterward to some observers that banks failed to take advantage of the repo rate spike by lending their excess reserves in the repo market. Such a trade seemed as if it would be a simple arbitrage opportunity, with a gain equal to the SOFR-IOER spread. But this did not happen on Sept. 17, or at least not enough to keep the repo rate from spiking.

One potential explanation is that the potential arbitrage gains for banks were just not that big. Even when the SOFR-IOER spread widens to 3.15 percentage points, as it did on Sept. 17, the gain for a one-day trade amounts to less than 0.01 percentage points. “With capital being so carefully allocated across bank business lines these days, repo desks just don’t have the nimbleness to act on the type of spreads seen on Sept. 17,” says William Nelson, chief economist for the Bank Policy Institute. “However, if that type of spread had persisted, you might have seen more trading.”

There has been much discussion about the role of bank regulation and supervision in the spike. Postcrisis regulations do not appear to have played a major role in the reluctance of banks to lend in the repo market. For instance, the Liquidity Coverage Ratio (LCR) — designed to make sure banks have enough high-quality liquid assets — treats Treasuries as equal to reserves. Thus, in theory, the LCR should not have discouraged banks from lending in the repo market, provided that the lending was collateralized by Treasury securities.

But bank supervisory guidance may have played an important role. Under the Fed’s postcrisis policy of abundant reserves, banks and their supervisors have become more accustomed to banks operating with large reserves. And market observers have suggested that banks — perhaps wary of increased supervisory scrutiny — have become more conservative in their reserve management and more reluctant to run daylight overdrafts. “The largest banking institutions manage so many settlements. ... The quantum is enormous. It varies, both in the size ... as well as in the timing,” according to Sandra O’Connor, former chief regulatory affairs officer at JPMorgan Chase, who spoke at a Brookings Institution panel in December 2019. In her view, banks use their excess reserves as shock absorbers to ensure they don’t breach intraday overdraft, because there’s a stigma associated with it. Consequently, “there’s a lot less willingness to lend out that last dollar because it could result in an overdraft.”

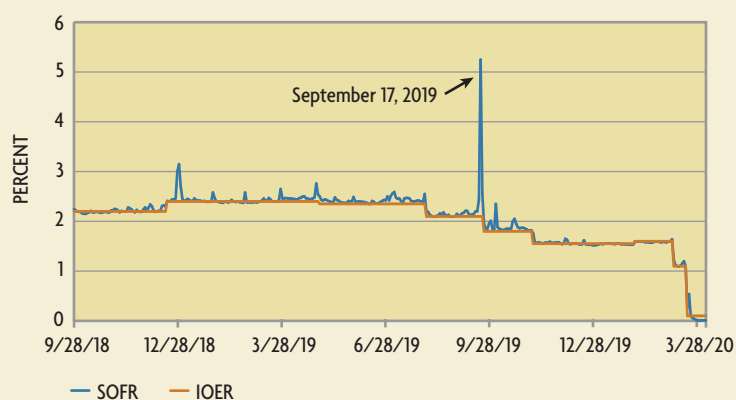
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Repo Rate Spike

Repo Rate (SOFR) vs. Interest Rate on Excess Reserves (IOER)



SOURCE: Federal Reserve Board via FRED

Banks’ conservative approach to reserve management appears to have been reflected in their internal stress tests, which they use to make contingency plans for periods of market stress and illiquidity. Fed Vice Chair Randal Quarles has suggested that banks’ internal stress tests may have played a role in the rate spike by creating too great a preference for central bank reserves over other high-quality liquid assets, including Treasuries.

More Changes?

There has been no shortage of policy proposals to avoid a repeat of the Sept. 17 rate spike. A prominent proposal has been the creation of a “standing repo facility.” This program would have the Fed actively capping the repo rate by standing ready to lend at a specified target rate — presumably equal to, or close to, the federal funds target. The Fed is also looking at alternative ways to enhance repo market liquidity, such as encouraging banks to more fully incorporate discount window access into their internal stress tests.

As a practical matter, the Fed has been actively lending in the repo market since Sept. 17 — after a nearly 10-year hiatus — and has more recently promoted market liquidity by activating a number of credit programs, including the PDCF.

The repo market has rarely sat still for long. After having undergone a major legal and structural transformation in the 1980s, its functioning was fundamentally altered by the 2008-2009 financial crisis. Faced with the current crisis, it appears poised for further change. **EF**

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