

Turmoil in the Repurchase Market

Summary:

Since September 2019, the Federal Reserve (aka “the Fed”) has been intervening in the repurchase market (“repo market”), due to an unexpected scarcity of short-term funding availability that led interest rates to spike to ~10% from a “normal” rate of ~2%. This article explores the causes of the ongoing stress in the repo market and the role that banks and investors play in a market that forms an important part of the plumbing of the US financial system.

Banks, as the largest source of funds to short-term borrowers, should have a strong interest in maintaining the stability of the repo market – however in recent years, banks have used the repo market primarily to create systems that enable them to grow and maximize short-term profits while minimizing their risks. Similarly, the growth of certain investment fund strategies that seek to maximize short-term reward / risk utilize the repurchase market as a source of leverage, causing the market to become more fragile and subject to failure in downturns.

Banks rely on a well-functioning repo market to fund daily operations and facilitate the flow of dollars through the US and global economy. If the repo market didn’t exist, the global banking system and global credit markets would be much smaller, and as a result the global economy wouldn’t have made the progress it has made to date. Banks must act with respect to maintaining the stability of the repo market without government intervention; in doing so, they would take actions that maximize their long-term profits and ensure a stronger long-term growth trajectory for themselves and the global economy.

Understanding the fragility of the repurchase market is key because weakness in the repo market can spill out rapidly and impact other parts of the economy; in 2008, a frozen repo market was one of the most damaging aspects of the global financial crisis, causing significant pain to the banking system and precipitating a massive reduction in business and household spending that caused the worst US recession since the 1930s. This article will explore the causes of current stress in the repurchase market and the short-and-long run impacts of the Fed’s massive interventions.

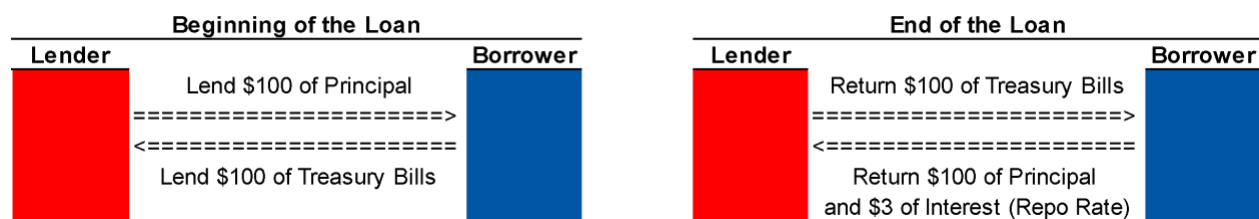
How does the repurchase market work? What benefits does the repurchase market bring to the US economy?

A repurchase agreement (“repurchase” or “repo”) is a transaction in which one party lends cash to another in exchange for a roughly equivalent value of another asset as collateral. The repo market is most frequently used by financial institutions such as banks and investment vehicles such as hedge funds, money market funds, and insurance companies to fund day-to-day operations and trading activities.

The asset that is being exchanged for cash must be a relatively stable asset, whose value doesn’t fluctuate much on a daily basis, and physical possession of the asset must be easily transferable over a very short period of time. Repurchase transactions therefore rely on stable financial assets (most commonly US Treasury securities) vs. hard physical assets (land, equipment, etc.) or even stocks, which tend to be too volatile.

The key feature of the repurchase agreement (which explains why it’s called a “repurchase”) is that the borrower agrees to buy the collateral back at a later date, often as soon as the next day, for a slightly higher price. The difference between the amount that is lent and the amount that is paid back determines the interest rate for the loan, and is called the “repo rate”¹.

Below is a schematic showing how a typical repo works, assuming a loan of \$100 and a repo rate of 3%.



The repo market is a composite of these types of agreements over many timeframes, and results in over \$3 trillion in debt outstanding every day².

Repos benefit the broader economy by letting large, cash-rich financial institutions such as investment funds and banks earn interest income by briefly lending their cash, and allowing banks and brokers – who hold a lot of securities but don’t always have a lot of cash to get the financing they need to run their day-to-day businesses³. Banks and

¹ <http://people.stern.nyu.edu/jcarpen0/courses/b403333/08repo.pdf>

² <https://www.sifma.org/resources/research/us-repo-market-fact-sheet-2019/>

³ <https://www.bloomberg.com/news/articles/2019-09-19/the-repo-market-s-a-mess-what-s-the-repo-market-quicktake>

broker-dealers in particular are large users of the repo market as a source of funding to support market-making inventory and support other short-term operations⁴.

The Fed uses the repo market as a tool through which to conduct monetary policy operations in order to temporarily “fine tune” the amount of reserves in the banking system. While the Fed primarily relies on open market operations – purchases and sales of Treasuries held by the banking system – the Fed is able to more nimbly respond to temporary, minor swings in the amount of reserves by using the repo market⁵.

The repo market is also used by non-bank financial institutions as a source of cash and leverage to fund a number of trading strategies – the most important of which are “relative value” strategies.

What are Relative Value strategies and what role do they play in the repo market?

Relative Value strategies take advantage of small differences in pricing between two related securities and generate significant profits using high levels of leverage to magnify those small differences. This strategy has grown in popularity over the last few years because it provides a steady stream of income in a low-volatility environment which can be leveraged significantly to generate a very high ROI⁶.

Relative value strategies are thought to bring a few key benefits to the financial economy – (1) they are thought to provide investors with a way to reduce portfolio risk via diversification; and (2) they are thought to make markets more “efficient” by arbitraging slight mispricings between two related securities – bringing their price closer to their “true value”.

Relative value trades typically require high levels of leverage because the quantum of the mispricing they exploit is very small. Relative value traders that focus on the Treasury market can achieve high levels of leverage using Treasury securities as collateral because Treasuries are considered very safe assets that have high collateral value (it is rare for Treasury securities to lose significant value in a short period of time)⁷.

While leveraged relative value strategies seem safe in low-volatility markets, these strategies have a number of drawbacks. For example, as volatility in the repo market picks up, these trades can generate significant mark-to-market losses for relative value traders, forcing them to have to unwind those trades to reduce leverage, which results in

⁴ <https://www.bis.org/publ/cgfs59.pdf>

⁵ <https://www.newyorkfed.org/aboutthefed/fedpoint/fed04.html>

⁶ <https://www.bis.org/publ/bisbull02.pdf>

⁷ <https://www.bis.org/publ/bisbull02.pdf>

additional volatility in the market. This situation, which is called a “margin spiral”, can cause significant disruptions to the repo market unless banks and other broker-dealers can step in to absorb sales and build up an inventory of securities to prevent a market break-down. When the banks and other broker-dealers are unwilling or unable to shore up the market in times of stress, a margin spiral can become an important fragility of the repo market and the broader economy.

How did the banking system become so reliant on the repo market?

Prior to the 2008 financial crisis, banks carried much less cash on hand than they do today – the total amount of bank reserves, or cash issued by the Federal Reserve, grew from approximately \$20 Billion before 2008 to over \$2.5 Trillion by October 2014⁸. Regulations were more lax than they are today, and as such banks were required to carry less capital. Additionally, carrying less cash on the balance sheet enabled banks to earn higher returns, while not actually reducing their ability to operate their business model.

The financial system has funding mechanisms that enabled banks to operate with less cash on their balance sheets – the most important of which was the unsecured interbank market, where banks with excess cash can lend on a short-term basis without collateral to banks who are expecting a cash shortfall⁹. The Fed effectively sets the interest rate in this market, which is called the Federal Funds Rate (which is the rate that forms the benchmark for lending rates throughout the US economy).

After the financial crisis, banks lost trust in their counterparties. In the funding markets, this manifested in banks demanding collateral to secure short-term interbank lending (which protected them from lending to a potentially unstable counterparty), and since the existing unsecured interbank market couldn't support this, most interbank lending shifted to the repo market¹⁰.

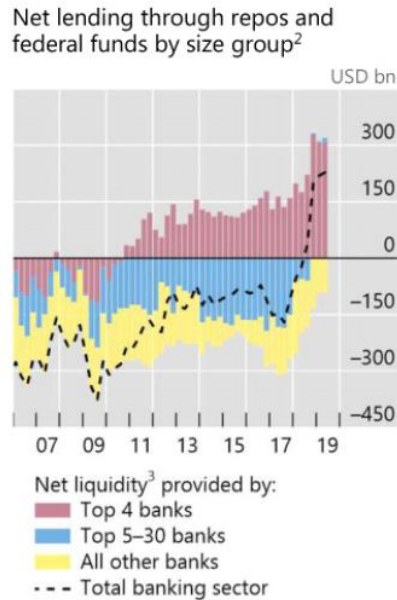
What caused the stress in the repo market in September?

Since the financial crisis, lending in the repo market has become more and more concentrated in the hands of the top 4 banks (JP Morgan Chase, Citi, Bank of America, Wells Fargo), as shown in the chart below:

⁸ https://www.yalejreg.com/nc/repo-in-turmoil-the-curious-case-of-the-missing-reserves-by-marcelo-m-prates/?mod=article_inline

⁹ <https://www.investopedia.com/terms/f/federalfundsrate.asp>

¹⁰ <https://www.coppolacomment.com/2019/12/the-blind-federal-reserve.html>



This concentration has become more apparent since 2015, when the Fed began to reduce the size of its balance sheet by reversing its post-financial-crisis Quantitative Easing (“QE”) program. As the Fed pulled reserves out of the financial markets via reverse-QE, cash in financial markets became scarcer and the interest rate in the repo market began to rise gradually. This incentivized the big banks, which at that point were very well capitalized, to reduce the amount of cash they held at the Fed (which earned a relatively low rate of interest) and begin increasing their participation in the repo market.

Since mid-2018, the entire repo market has become dependent on funding from just these 4 big banks – and if those banks (or even one of those banks) choose to reduce the amount they lend, it could cause a significant liquidity shock. This places the big banks in the position of being “lender of last resort” to the repo and interbank financing markets – a role that was traditionally held by the Fed, but which is now being served by enterprises which are seeking to maximize ROI per unit risk¹¹.

This shift in the structure of the repo market helps explain why the market is not functioning correctly –one or more of the banks likely reduced the cash they lent into the repo market in response to some stimulus, and the shortage of cash caused the market to seize up. The banks have offered multiple explanations for the market failure: (1) the Fed raising interest rates, which reduced the supply of money available for banks to lend in the repo market; (2) \$120B of taxes and debt came due all on the same day,

¹¹ <https://www.coppolacomment.com/2019/12/the-blind-federal-reserve.html>

sucking much-needed cash out of the repo market¹²; (3) Post-financial crisis regulations are limiting the amount of cash that big banks can lend in repo markets¹³ (4) Greedy hedge funds sucked up all of the liquidity in the market to generate better levered returns¹⁴. While all of these causes likely contributed to the seize-up in the repo market, none of them explicitly account for the banks' stepping back from their position as the most important lender in the market.

How did the Fed Intervene, and why has the size of their intervention continued to expand?

The Fed intervened by stepping into the repo market as the lender of last resort with the idea that what they lend into the market will then be recirculated by the banks, adding much-needed liquidity into the market. This type of intervention runs the risk that, rather than recirculating the funds, banks will hold onto the cash for their own purposes¹⁵. If the banks don't step back into their roles as key lenders, the market will remain short of cash, and the problems that caused the market failure in September would continue unabated - meaning that the Fed would not be able to end its direct intervention into the repo market. In order to avert this outcome, the Fed also began injecting additional cash into the banking system by purchasing \$60 billion of Treasury bills per month, in the hopes that increasing cash on banks' balance sheets would encourage them to increase lending activity.

The Fed's intervention was critical in preventing the repo market from completely collapsing – absent their intervention, it is likely that the unwind of relative value and other leveraged strategies would have increased volatility in the market for an extended period of time, causing a disruption that may have spread to other financial markets. Without the Fed stepping in to calm markets, this disruption could have precipitated a financial crisis that could have spread quickly to other sectors of the economy.

In October and November, the Fed increased the size of its intervention as the demand for Fed funds from banks exceeded the amount offered. In December, the Fed announced that it would be increasing its intervention in the repo market to \$300 billion amid mounting fear that the banks might further reduce the amount of cash available for repo loans in order to increase their cash holdings and meet regulatory requirements that are measured on December 31. As time went on, it became evident that the Fed's intervention was critical for the proper functioning of the repo market – there was no clear way that it could untangle itself anytime soon.

¹² <https://www.wsj.com/articles/the-repo-market-what-it-is-and-why-everyone-is-talking-about-it-again-11568743438>

¹³ <https://www.cnbc.com/2019/10/01/reuters-america-analysis-too-big-to-lend-jpmorgan-cash-hit-fed-limits-roiling-u-s-repos.html>

¹⁴ <https://www.ft.com/content/6427f16a-1d05-11ea-97df-cc63de1d73f4>

¹⁵ <https://www.wsj.com/articles/big-banks-loom-over-fed-repo-efforts-11569490202>

Theoretical Framework for Understanding Repo Market Issues

The core principle underlying the theory that follows is that rational economic actors today seek to maximize short-term profits and cash flow (together, “profit”) while minimizing the burden of the risk associated with maximization of short-term profit. The approach that these rational economic actors take to minimizing risk can have significant consequences to the broader economy, as we will see below.

When an economic actor possesses asymmetric information, they can use it to create a system in which they believe they have virtually no risk of loss. In doing so, they justify their existence (by generating positive ROI) and minimize their risk of loss by transferring it to other participants in the system. These actions create a situation where the outcomes generated by the system are binary (win or lose) and have personal implications for the economic actor (i.e. a win justifies their existence and a loss creates anxiety by indicating the existence of risk that they didn’t externalize adequately or that their information advantage is weak).

In today’s economy, generating a system like this is often seen as an effective, low-risk pathway to profit maximization, but can create instability as the economic actor takes actions that prioritize its own profit without necessarily taking into consideration the impacts of its actions on the broader financial and economic system. The hallmark of this approach to profit-maximization is that when an economic actor feels that its profits are threatened, it disregards its responsibility to maintaining normal functioning of the markets it participates in, and the benefits that it gets from these markets, and takes action to protect its own profits consistent with its perceived responsibilities to investors.

When the economic actor sees that the system they have created is at risk of failure (which makes them vulnerable to losing), they attempt to generate additional asymmetric information and try to either reinforce their existing system or create a new system where they can win again.

We can use this framework to piece together an explanation for what happened to the repo market in September 2019. In the years after the financial crisis, the big banks did an excellent job of recapitalizing and positioning themselves to earn more profit. They accepted government bailout money (via TARP), grew in size and power through consolidation and used their power to persuade the government to enact favorable policy, driving significant growth in profit and cash flow as the economic recovery progressed.

Over the course of 2019, however, banks began to experience diminishing marginal returns from their strategy, and saw economic markers begin to deteriorate as the economy moved slowly towards recession. Both of these events posed key threats to the banks' operating thesis and the system they had created to protect and grow their profits over the last decade.

In response to this threat, the banks began to take defensive moves. For example, J.P. Morgan, possibly the largest and most important player in the repo market, moved much of its available cash into higher-yielding securities to take advantage of rising interest rates, which reduced the cash it had available to lend to the repo market by almost 60%¹⁶. Other banks also reacted similarly (e.g. Bank of America reduced its cash balance by 30%) – every single one of the big banks followed the model laid out above, prioritizing their own profit at the expense of the stability of the repo market. In taking these steps, the banks

The practical effect of these actions likely rippled throughout the economy, but can be clearly seen in the repo markets. The big banks' defensive moves reduced the availability of cash in the repo market, causing interest rates to spike in September when that cash was needed the most. When the repo market started to show signs of stress, the banks attempted to create narratives to shift the blame for the market failures away from themselves, explicitly blaming “onerous regulation” for their reduced participation in the repo market¹⁷. This narrative, in their view, likely positioned them to reinforce the existing system they created (by forcing regulators to intervene in the repo market and loosen regulations and monetary policy) so that they could win again.

The Fed's intervention in the repo market has created a backstop that ensures the market will still function – but this intervention doesn't come for free – it must be supported by an expansion in the US Government's debt (when the Fed creates money in the form of reserves, it creates a liability on its balance sheet – because the Fed is a government institution, that liability is borne in some form by future taxpayers). Ultimately the effect of the Fed's intervention is twofold: (1) the repo market was stabilized in the short-term; and (2) the burden of the banks' drive for profit maximization today is likely to be borne by individual US wage-earners and taxpayers in the future; ever-expanding government debt can result in higher interest rates (decreasing investment and future income), impeding the country's ability to grow and resulting in a decreased standard of living for its citizens¹⁸.

¹⁶ <https://www.cnbc.com/2019/10/01/reuters-america-analysis-too-big-to-lend-jpmorgan-cash-hit-fed-limits-roiling-u-s-repos.html>

¹⁷ <https://seekingalpha.com/article/4316836-jpmorgan-chase-co-jpm-ceo-james-dimon-on-q4-2019-results-earnings-call-transcript>

¹⁸ <https://stanfordreview.org/clarifying-the-implications-of-the-reinhart-rogoff-excel-error/>

By February 2020, before COVID-19 began to spread in America, the turmoil in the repo market had subsided thanks to the Fed's interventions – indicating that the banks felt they had managed to adequately reinforce the system they had created and that their path to continued profit growth was secure. In March, however, as the economic consequences of COVID-19's spread through the US became clearer, the banks' path to profit growth was threatened again – and as investors across many financial markets rushed to the relative safety of US Dollars and Treasuries, the banks began to pull back from lending into repo markets once more. As liquidity in the repo market dried up, the market became volatile and fell into a margin spiral once again. As the contagion in the repo market began to spread, investors outside the repo market (including levered systematic strategies such as “relative value” and “risk parity”) became forced sellers of Treasuries, and the Fed was forced to expand its intervention again. By March 15th, the Fed had announced \$1 trillion of interventions into the repo market and \$700 billion of Quantitative Easing¹⁹ to alleviate pressures in the repo and banking markets. While this may have quelled fears of a near-term collapse of the repurchase market, the long-term cost of this intervention continues to grow.

The fragility we have outlined in this core financial market mirrors fragilities elsewhere in the economy that are caused when rational economic actors maximize their reward / risk ratios without taking into consideration the broader impacts of their actions on the economy. Economists who have identified this phenomenon call it an “externality”. In order to solve these externalities, and maximize the ability of financial markets and the broader economy to function properly and for the benefit of every member of society, the fundamental reward / risk evaluation that companies undergo must be expanded to take into account the second and third order effects of their actions on the broader economy. Economic actors must think beyond a simple analysis of short-term profit maximization. In the next article, on Quantitative Easing, we will examine ways in which the US economy currently attempts to solve these externalities.

¹⁹ <https://www.cnbc.com/2020/03/15/federal-reserve-cuts-rates-to-zero-and-launches-massive-700-billion-quantitative-easing-program.html>

Background Information / Citations

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