

MONEY IN THE TIME OF CORONAVIRUS

C. Sissoko, A Fire Sale in the US Treasury Market: What the Coronavirus Crisis Teaches us About the Fundamental Instability of our Current Financial Structure

March 27, 2020

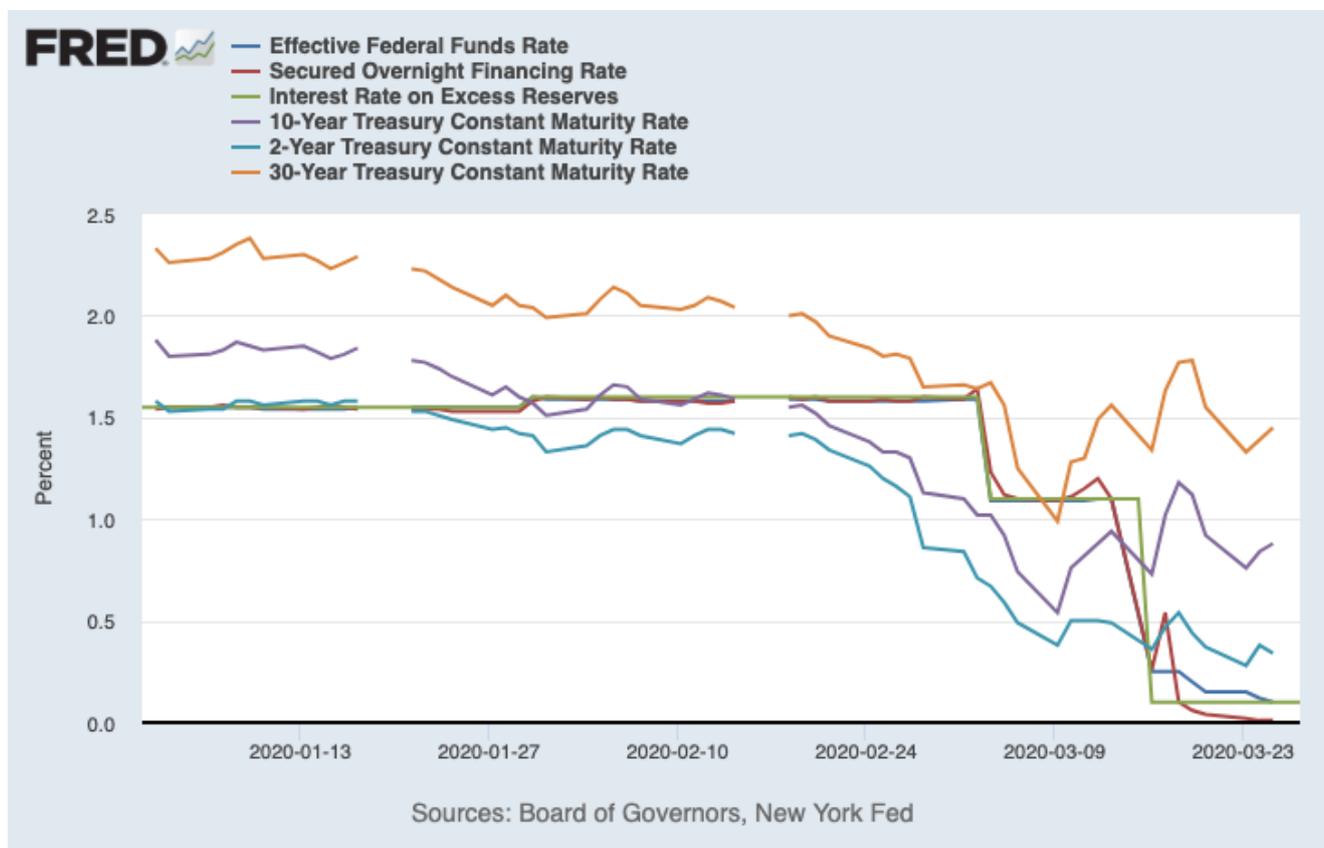
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A recurring theme in the papers that I have written is that asset price instability is endemic in a system of collateralized lending based on repurchase agreements. Even I, however, was caught completely off-guard when it was the US Treasury market that began to experience fire sales.

Almost everybody[i] thought that by moving the repo and derivatives collateral market into “safe assets” or bonds issued by the most credit-worthy sovereigns, the repo market could be de-risked. What we learned over the past few weeks is that the ineluctable logic of margin calls and forced sales can play havoc even in markets for the safest collateral. This throws into doubt the very concept of a “safe asset” and makes clear how dependent the concept is on the underlying market micro-structure.

Here is a chart that gives year-to-date values for the Fed’s policy rate (green), the market repo rate (SOFR: red), the yield on the 2-year Treasury (light blue), the yield on the

10-year Treasury (purple) and the yield on the 30-year Treasury (orange).

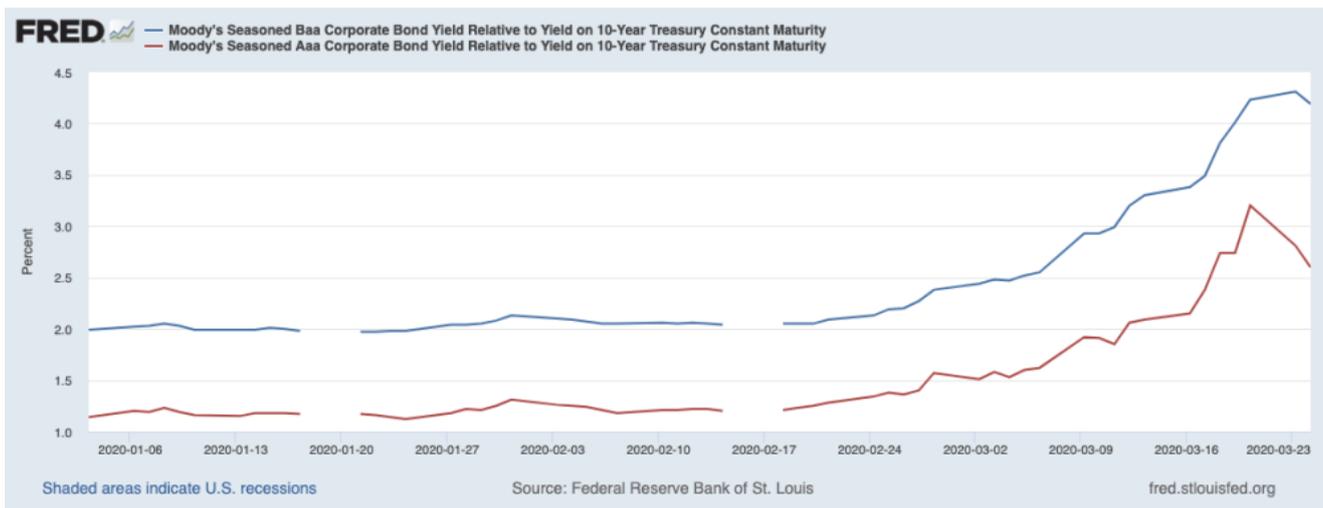


Keep in mind that when the Treasury yield declines, that means that people are buying Treasuries and that the price of Treasuries is increasing. And when the Treasury yield rises that means that people are selling Treasuries and that the price of Treasuries is falling.

Starting in mid-February, this chart depicts a 'flight to safety' into Treasuries as the corona virus crisis generated uncertainty for investors and they chose to shift into Treasuries. This is what we expect to happen with a 'safe asset.' What is remarkable about this chart is what happens after March 9. Treasuries are clearly being sold in significant amounts after March 9.

I have seen two explanations for the onset of this phenomenon. The first explains that the flight to safety took place faster in futures on Treasuries than in the actual Treasuries themselves and that this caused a significant price gap between the two contracts. As there are hedge funds that arbitrage these two prices – and, because the return on this trade is so small, engage in this arbitrage on a highly leveraged basis – the price gap resulted in significant mark-to-market losses for these funds. Apparently, these arbitrage funds chose to sell out of their positions – realizing their losses now before they got worse. Liquidation of arbitrage positions is notorious for causing price gaps to worsen and for causing others engaged in a similar trade to also choose to liquidate their positions. The liquidation of these positions involved selling Treasuries.

The second explanation starts with investors in bond funds, including both mutual funds and exchange-traded funds, deciding that they no longer wished to hold those positions since the coronavirus was likely to have a significant impact on many firms that issued bonds. When investors exit bond mutual funds, the managers of those funds have to reduce their holdings of bonds. The process for exchange-traded funds is more complicated, but has the same overall effect: if investors sell their bond ETFs, then the ETFs themselves will end up selling bonds. You can see the effect of these sales on the chart of the spread between corporate bond yields and Treasuries.



Since these sales were of corporate bond funds, one can easily ask how this behavior could end up causing a sale of Treasuries. The answer is that many bond funds have some Treasuries in their portfolios. As sales of corporate bonds ramped up and the bond fund managers didn't like the prices they could get on the corporate bonds – or the price effects they would generate by adding to the sales – they turned to selling off Treasuries to meet their redemptions needs.

Whatever the underlying cause of the sales of Treasuries was, we can see in the first chart that, on March 10, sales of Treasuries were so significant that they drove the price of Treasuries down and their yields up. This continued through March 12, when the Federal Reserve tried to address the problem by flooding the repo market with \$1.5 trillion. While the Fed was successful in bringing the repo rate, the Secured Overnight Financing rate (SOFR), down, repo liquidity couldn't address the selling pressure in the Treasury market, and Treasury yields continued to rise.

With the sudden decline in the price of Treasuries, the negative feedback loop that is inherent in the repo market and in the related market for derivatives collateral kicks in

(see Adrian and Shin 2010, Gabor 2016, Gabor and Ban 2016, Sissoko 2016).

The negative feedback loop in repo works like this: a decline in the value of collateral results in a margin call. As an example, assume a borrower has borrowed \$98 by posting \$100 in Treasury collateral and is required to maintain a haircut (or excess collateral) of 2%. Then a decline in the value of the Treasuries to \$99 will lead to a \$1 margin call that can be met with either cash or collateral. That is, to support a \$98 loan, \$100 of Treasury collateral must be maintained. Alternatively, a payment of \$1 in cash will reduce the loan to \$97 against \$99 in collateral. If the borrower happens to own additional, unpledged Treasuries, the call is easily met. However, when the repo borrower is at the limits of her borrowing capacity, the margin call forces the borrower to scramble to meet the call with additional cash or collateral. This will in general force the borrower to sell something. In other words, margin calls generate a demand for cash.

Furthermore, if the borrower fails to meet the margin call, then the lender sells the collateral to pay back the \$98 loan. Note that the lender has no incentive to seek the best price for the collateral – the lender just wants to make sure that the \$98 loan is covered – any excess returns from the sale of the collateral have to be remitted to the borrower. In short, margin calls generate sales either from borrowers desperate for cash or from lenders who are liquidating the collateral to close out the repo loan. These sales push prices down further and generate more margin calls. The bottom line is that repo has always been associated with fire sales of assets in crises. These fire sales are a function of the contractual structure of the repo loan.

The issue at the present moment is that the coronavirus crisis has caused a significant increase in the volatility of many financial markets. When volatility increases, the collateral that needs to be posted in derivatives contracts typically increases too. So, the crisis has been accompanied by an increase in the collateral that needs to be posted. As a result, demand for collateral has increased. Collateral that could meet demand in late February would not be enough to meet demand in mid-March. (Indeed, it's possible that this dynamic had already started playing a role well before March 13.)

At the same time, as we have seen, the fall in Treasury prices from March 9 to March 13 meant that the supply of collateral had declined. In fact, for 30-year Treasuries, a rise in yield of 0.5% as we see over this period can be associated with a decline in value of 8% or more. While the effects are smaller for Treasuries with shorter maturities, the aggregate effect on the supply of collateral that is generated by the interest rate movements in the first chart is both substantial and dramatic. Furthermore, this decline in value affects each and every owner of long Treasuries. In short, from March 9 to March 13 traders who held long Treasuries as "safe assets" learned (as they had always been told by people who pay attention to these things) that even Treasuries can be risky assets. This undoubtedly increased the demand for cash, and the incentive to sell long Treasuries.

This decline in the value of long Treasuries caused collateral positions everywhere to fall. The decline in collateral was inevitably accompanied by margin calls. In these circumstances there were inevitably some traders who were unable to meet the calls or who were desperately looking for cash to meet them. They looked at long Treasuries as risky assets, because they didn't know how long this cycle of margin calls was going to continue – and how far the price of 30-year Treasuries could

fall, which generated a strong demand for cash and very short Treasuries. Traders who didn't meet their margin calls faced forced sales of their collateral, resulting in more sales of Treasuries. With these sales came lower prices and more margin calls and more sales, with no clear end in sight.

This is the fundamental nature of repo and similarly structured markets. When traders' balance sheets are stressed, all it takes is a fall in the price of collateral to turn the repo market into a coordinating device that generates a vast liquidity drought, hitting everybody in the market. We saw this in March and September of 2008, but then the cycle was stopped by dramatic Federal Reserve action before Treasuries became illiquid. And almost everybody, certainly including myself, thought that the shift of the repo market out of private sector collateral would help stabilize it. What we learned over the past two weeks is that, in a crisis, repo markets don't just act as a vortex sucking liquidity out of the financial system, but that this vortex is so strong that not even Treasuries can be treated as "safe assets."

From March 15 through March 17, the Fed took dramatic actions, providing liquidity to the banking system, opening swap lines with five central banks, restarting quantitative easing, re-opening crisis programs to lend to investment banks against collateral and to help non-financial corporations to borrow on commercial paper markets. Even so, the yields on Treasuries continued to rise through March 18. Only after the Federal Reserve re-opened crisis support for money market funds (March 18) and extended swap lines to nine more central banks (March 19) did the yields on Treasuries finally begin to fall. Even so, by end of day on March 20, yields had still only fallen to their level on March 13 and remained far above their March 9 level.

Thus, on the morning of March 23, the Federal Reserve took unprecedented action, expanding its support of credit markets far beyond the policies it adopted in the 2008 crisis. Most important to the repo market, the Fed declared that it stood ready to buy Treasuries in unlimited amounts. In short, the Federal Reserve is now a backstop for the price of Treasuries at all maturities. In my opinion, the Fed's actions on March 23 were designed to put a stop to the repo markets' forced run on Treasuries. And I believe the Fed has succeeded: yields on Treasuries dropped on Monday and the Fed has the means to keep them from rising significantly.

While the Fed may have stabilized the Treasury market, when the health care crisis has passed, it will be time to reconsider whether we want to continue to rely on repo markets now that we have seen twice in a dozen years how they suck liquidity out financial markets just when it is most needed. Structural reform of our money markets needs to be on the agenda.

[i] Gabor and Ban 2016 is an exception.