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A Fed for Next Time: Ideas for a Crisis-Ready Central Bank: Panel 3 Modernizing Liquidity Provision

How Will the Fed Fight the *Next* Crisis?

In just a dozen years, the Federal Reserve has faced two severe crises. And twice it has responded by leaning heavily on emergency lending powers it seldom used before by improvising temporary lending programs and taking part in fiscal policy.

In the meantime, the Fed's nonemergency lending facilities have hardly changed, and may well prove insufficient when the Fed faces its next crisis.

The implication of this is both obvious and ominous: while we still count on the Fed to deal with crises, we no longer know how it will deal with them. Instead of being predictable, the Fed's crisis-prevention methods have become unpredictable—and controversial—adding to, instead of allaying, economic scrutiny.

Can we do better? Can we improve the Fed's systematic response to crises, making that response both more effective and more predictable? Can we thereby limit the Fed's entanglement in politics? What can the Fed do to promote these ends? What might Congress do?

PANEL 3: MODERNIZING LIQUIDITY PROVISION

Bill Nelson, executive vice president and chief economist at the Bank Policy Institute

Jeremy Kronick, associate director of research at the C.D. Howe Institute

David Andolfatto, senior vice president of the St. Louis Fed's research division

Moderator: Jeff Cox, finance editor at CNBC

Introductory Remarks

George Selgin: Good afternoon, everybody. And welcome to the joint Cato-Mercatus Conference, “A Fed for Next Time: Ideas for a Crisis-Ready Central Bank.” This conference is devoted to exploring possibilities for reforming the Fed, to better prepare it for future crises, while at the same time, protecting it from fiscal dominance, and importantly, protecting ourselves and our democracy from dominance by the Federal Reserve. Today's session is on modernizing liquidity provision. And I'm very pleased to introduce its moderator to you, CNBC's finance editor, Jeff Cox. Jeff, take it away.

Panel Discussion

Jeff Cox: Thank you, George, for your kind introduction. And I also want to thank the Cato Institute and the Mercatus Center for hosting this important conference, which comes at, as we all know, a very critical time. As someone who spends probably way too much time thinking about these things, it's a pleasure to be around and to geek out as much about these kinds of issues as I do.

I'm looking forward to a vigorous discussion about really important challenges facing the Fed and in Central Banks ahead. And indeed, that's what we want to focus on today. Not to look back on the lending and liquidity programs that the Fed has provided during the coronavirus pandemic, rather a view to the future. We know one of the questions is just how can the Fed shape monetary policy, so it need not be so reactive when facing future crises, but rather have a more solid fundamental base from which to address flare ups in market functioning. Of course, all that while also focusing on its dual mandate of full employment and price stability.

We have three esteemed panelists onboard today to discuss this, and it's a pleasure to introduce them. First up, I'd like to introduce Bill Nelson. Bill is the Executive Vice President and Chief Economist at the

Bank Policy Institute. Previously he served as Executive Managing Director, Chief Economist, and Head of Research at the Clearing House Association, and he's been Chief Economist of the Clearing House Payments Company. Prior to joining the Clearing House, he was the deputy director of the Division of Monetary Affairs at the Fed, where his responsibilities included monetary policy analysis, discount window policy analysis, and financial institution supervision. As you know, Bill is in a unique position to talk about some of these issues.

Today, he's going to speak to us about how to address liquidity problems in financial institutions. Just to note that Bill is coming to us from a fairly remote location, and let's just say parts unknown. So we have some issues with Bill's connectivity today. After Bill, we'll have the Associate Director of Research at the C.D. Howe Institute. He's in charge of the financial services and monetary policy research programs at the institute. He's written on a range of topics, including the link between demographics and monetary policy, how blockchain technology will impact the economy, and the importance of the financial services sector in trade negotiations.

Prior to joining the C.D. Howe Institute in early 2015, Jeremy worked in the international tax department at Deloitte and Touche in both the financial stability and international departments of the Bank of Canada, and he's also been a lecturer at Brandeis University, where both macroeconomics and microeconomics while completing his PhD studies. Today, he's going to explain the Bank of Canada and the Fed, and how they could be instructive for the Fed going forward.

Joining Bill and Jeremy is David Andolfatto. David is Senior Vice President of the research division at the St. Louis Fed. He was a professor of economics at the University of Waterloo and Simon Fraser University, before joining the Fed in July 2009. David's published several articles in leading economic journals, and he has been invited as a visiting scholar around the world. And in 2009, he was awarded the prestigious Bank of Canada Fellowship Award for his contributions in the area of money, banking, and monetary policy. David today is going to talk about the standing repo facility. So with the introductions aside, let's move into the conversation. Bill, are you there with us? I'm not hearing from Bill. Maybe we can just jump in to Jeremy.

Jeremy Kronick: Thank you for the introduction and for the invitation. Thanks also to Cato and the Mercatus Center. Honestly, I'm honored to be here today, even in this virtual capacity. Since I'm unique on this panel, in terms of my focus on the Bank of Canada, I thought I'd start with the mandate of the bank and how it differs from the Fed. The primary difference in Canada is that we do not have a dual mandate. The bank is an inflation targeting central bank. This objective is formalized under a renewable joint agreement, typically every five years between the Bank of Canada and the Government of Canada, specifying our 2% target for inflation, which is the midpoint of a 1% to 3% range.

The next renewal, interestingly given the times, comes next year. In normal times, the bank simply adjusts the overnight policy rate in order to hit the inflation target. Obviously in crisis times like we face today, the bank much like the Fed, must take more comprehensive measures to ensure the financial system continues to play its role of providing credit where it's needed. In terms of this crisis, the bank began its COVID related stimulus by lowering the overnight rate by 150 basis points over 350 basis point cuts in the span of just a few weeks. These moves brought the overnight rate to 25 basis points, which is a rate that the bank considers to be its effective lower bound.

But it was quickly apparent as it was here, that this crisis went far beyond conventional monetary policy. Of particular concern were strains in the Government of Canada bond market. Typically, the safest Canadian dollar denominated asset one can trade. In normal times, the bank purchases, small amounts of government and Canada debt on an ongoing basis to fine tune its balance sheet in order to hit the 2% target. However, in just two months, between the middle of March and the middle of May, 2020 Government of Canada bonds on the bank's balance sheet increased by about 50%.

While the size of these purchases certainly were extraordinary, Government of Canada bonds don't take monetary policy in Canada out of its traditional realm. However, many of the other purchase programs that the bank has introduced, including provincial and private sector credit asset purchases, those do, and these purchases necessarily cause the bank to take on credit risk. And while the details of these asset purchases to date, including the eligible issuers and the eligible assets

point to the fact that the bank is looking to mitigate as much of this risk as possible, the reality is that it can't completely negate this concern.

And this risk gets exacerbated through longer-term purchases, since the bank must take on the additional term risk. And unlike short duration debt, which it can let expire and roll off the balance sheet, longer-term assets likely have to be sold in secondary markets, bringing in additional political risk if the reduction in the balance sheet is for the purpose of inflation control, but might raise the borrowing costs for the issuer and I'll return to these risks in a bit.

So while it's true that purchase programs take the bank outside of its usual remit, it is pretty clear that the bank acted within its authority to do what it's done so far. The Bank Act in Canada is very specific on the business and the powers of the bank stating quite clearly that the bank may buy and sell securities issued or guaranteed by the Government of Canada or any province. And for the purposes of monetary policy or promoting financial stability, if the government's of the opinion that there is a severe and unusual stress in a particular financial market or in the system, they may buy and sell from or to any person, any securities, any other financial instruments, to the extent that the governor deems necessary.

So it's pretty clear, not surprisingly this being Canada and all. We haven't seen sort of the angry voices or the politicization of the bank's actions to date. That said, as I just mentioned, there is credit and political risk involved with purchasing non sovereign assets. And there could be implicit and explicit pressure to keep rates low with the large private and public sector debt overhangs that we've incurred as a result of the crisis and that we had in Canada coming into this crisis. So there's pressure to keep rates low that will have direct consequences for inflation targeting central bank, and the credibility that the Bank of Canada has in hitting that target.

To my mind, there really are two questions as relates to modernizing liquidity. First, are there ways to mitigate this credit and political risk? And then second, whether the dizzying array of new emergency facilities the bank has introduced during this crisis suggests the need to look anew at which liquidity tools the bank should make a permanent part of their toolkit.

On the first question, the bank is going to face, as I mentioned, a delicate balancing act with respect to debt management across Canada. As the economy reopens and inflation starts to reappear, the pressure to keep artificially, keep those rates low, to keep debt service costs down, could easily jeopardize the bank's credibility and independence. And Canada has benefited tremendously from strong fiscal and monetary anchors over the last 25 years, including through low risk premiums on government debt.

One idea that I floated around with Mark Zelmer, who used to be the deputy superintendent at Canada's Federal Financial Institutions Regulator is the idea of minimizing the credit and political risk by exchanging provincial and private sector debt with Government of Canada debt. The bank would still have the power to intervene as it saw fit, but it puts the Federal government in charge of managing the credit risk associated with this debt, leaving the bank to deal with only the Federal government debt of which it has much more experience, hopefully simplifying the process of achieving its inflation target. And this exchange wouldn't change the size of the bank's balance sheet.

On the second question of a more permanent market-wide emergency liquidity facility, we do need to first acknowledge how successful the Bank of Canada programs have been so far. They clearly reduced spikes in illiquidity and the Government of Canada debt market. They reduced the provincial borrowing spreads over federal debt, as well as bringing the provincial borrowing costs close to levels actually seen before the crisis. And they reduced illiquidity in corporate bonds.

In the short run then, the case can definitely be made for a successful intervention on the part of Canada Central Bank, as it helps put a floor on the fall in economic activity and avoided turning an economic downturn into a financial crisis. So the question though then is still could it have been done better? Might the spikes in illiquidity spreads and borrowing costs have been less sharp, if markets knew transparently what the bank was going to do when it stepped in? And I wrote about this topic five years or so ago, and in a year since there has been some movement on this front in Canada.

In the short run then, the case can definitely be made for a successful intervention on the part of Canada Central Bank, as it helps put a floor on the fall in economic activity and avoided turning an economic downturn into a financial crisis. So the question though then is still could it have been done better?

Right around the time I wrote [the paper](#), the bank introduced a permanent term repo facility, which is market-based, runs through an auction, and extends the term from overnight to one to three months. In crisis period, the bank starts with this facility and extends it as it sees fit, but the spikes in illiquidity I mentioned as well, as all the new programs introduced, suggest that there's limitation to this facility. To the extent that more permanent facilities are needed upfront, two questions that must be dealt with by the bank or first, how to deal with moral hazard concerns. And then second, how to design the auction to ensure the bank receives a competitive price for a given quantity of funding, which ought to generate then an optimal distribution of liquidity among bidders.

Now in terms of moral hazard, there's different ways to deal with it. But one option might be to set up any emergency facility, such that the market can only access it when certain negative financial metrics are met. And this is market-wide financial metrics. So this has the dual benefits in that it reduces the stigma in accessing the facility and it reduces moral hazard, since financial institutions have to wait until market conditions are sufficiently stressed.

The bank did add what they call the contingent term repo facility, which is at their discretion to activate when certain metrics are met, but we don't know what those metrics are in advance. This facility though is bilateral lateral. It's a non-auction facility. So it doesn't guarantee that competitive pricing and optimal distribution.

On a similar note, a less discussed issue, and perhaps a little less exciting one is around the auction design that gets us closer to these market outcomes. For market based liquidity facilities in Canada, the bank typically uses what's called a multiple yield auction. It's a single

round event and all funds are distributed simultaneously with a maximum number of bids allowed where the bid contains a value, a price, and a collateral it's pledging. Both the value and the price are subject to preset minimums. Winning bids are awarded such that the highest bid is accepted first and the yield bit is paid. And this continues until all the funds that are intended for allocation are sold.

There's a few issues though that arise with this form of auction. First, there's the distortion of optimal pricing and distribution of yield liquidity, which occurs whenever you restrict the amount of bids, because you limit the ability of bidders to create complete demand functions. Furthermore, if you set a minimum rate, it must be set incredibly carefully as the bank could run the risk of mispricing and restricting creation of its own supply curve. So to create a competitive equilibrium for particular collateral, ideally you have unlimited bidding and you don't set the minimum rates much above, if at all, the overnight target rate. For me personally, and I've written them that I prefer is the product mix design, which has been used by the Bank of England. In this design, all bidders consisting of various financial institutions may make an unlimited number of bids. Each bid includes an offer of per unit price using each variety of collateral. For example, one bid might be for \$500 million at 5.5% for the strongest collateral 5.8% for weaker and 6% for the weakest collateral. These unlimited bids using different forms of collateral, allow bidders to create complete demand functions. Once all bids have been sent in, the auctioneer would then analyze them and establish a minimum cutoff price for each variety of collateral. The auctioneer is able to analyze demand, a complete demand before choosing the prices.

In making the determination for the cutoff prices, the auctioneer must consider the central bank's primary objective. If total liquidity is the primary objective, for example, then they cut off yields and all the bids above this cutoff have to create this amount of funding for the market. The technical points get in maybe a bit further than we need to necessarily go, but ideally, what you're trying to achieve is a system whereby the surplus is maximized for both the bidder and the central bank setting up a competitive price and optimal allocation of liquidity across the market in a stressful time.

Maybe I'll stop here and I'll close by saying that with respect to this crisis, we haven't faced a backlash in Canada over the assets that the banks purchased. And we have seen the bank move fast as well, suggesting that speed of implementation isn't necessarily an issue, but there are future risks in the form of credit and political risks. Those are real concerns that can be mitigated further. And also assessing the question of whether we could have done better if we had more permanent predefined market mechanisms is certainly a critical one. And I hope that some of the ideas that I presented here around dealing with the moral hazard issue and the proper auction design might resonate with some of the folks that are listening in. I look forward to the Q and A and thanks again for the invitation.

Cox: Jeremy, thank you for that. Do we have Bill?

William Nelson: Yep. I'm here. Can you hear me?

Cox: Bill. Great. Terrific. Yeah, we can hear you. Thanks so much, Bill. Take it away, Bill.

Nelson: Okay, thanks. I'd like to thank George Selgin and David Beckworth as well as Cato and Mercatus for the invitation to speak today. And thank you, Jeff, for the kind introduction. I'm honored to be asked to speak on the tools the Feds should have to provide liquidity to the financial system. We were reminded again in March and April how critical those tools are. So in my remarks, I will discuss why it is important that the Fed be able to address the liquidity problems in the financial system, the authorities the Fed has to execute that responsibility and then recommend some changes to those authorities.

While central banks lend for a variety of reasons, including importantly, to execute their monetary policy responsibilities, I'm going to focus on lending to address liquidity problems at financial institutions. By liquidity problem I mean when a solvent institution is unable to make payments when due or provide funds on demand, because it has neither the cash on hand nor the ability to raise it. A liquidity default of a solvent institution is a market failure that central banks were created to and are uniquely suited to solve. Moreover, liquidity defaults are often contagious, leading to liquidity problems that other institutions as well. Worse, if financial institutions are not

confident in their own ability to meet demands on their liquidity, they will cease lending to other financial institutions and sell assets at fire sale prices, both actions that can turn liquidity strains into a liquidity crisis as we saw in the opening half of the great financial crisis.

To address liquidity strains, the Fed needs to have tools that are both powerful and flexible. Like Tolstoy's famous family, while lending in normal times is typically all the same, each financial crisis presents liquidity stresses in its own way. In 2002, for example, I prepared for the Fed an extensive detailed playbook. It was called the Survival Binder, including potential responses to a range of crisis events and an appendix of all the crisis tools available to the Fed and how to use them. None of the scenarios, however, looked like the 2007 to 2009 financial crisis and I didn't imagine creating the broad based facilities for non-banks that were a critical component of the Fed's response.

The Fed has four different legal authorities under which it provides liquidity, each supporting a different tool or situation. First, under section 14 of the Federal Reserve Act, the Fed is able to buy or sell treasury and agency securities in the open market and conduct repos and reverse repos of treasury and agency securities. These actions are generally referred to as open market operations. Section 14 also authorizes the Fed to buy foreign exchange and foreign government debt. The authority used to operate the Fed's currency swap lines with other major central banks. Second, section 10b of the act authorizes the Fed to lend on a collateralized basis to depository institutions, commercial banks, savings institutions, credit unions, and the US branches and agencies of foreign banks. Importantly, the Fed cannot lend to bank holding companies or non-bank subsidiaries of bank holding companies under 10b and the ability of a bank to borrow from the Fed and then on lend the funds to an affiliate is restricted by section 23a of the act.

The Fed provides three types of loans under 10b; primary, secondary, and seasonal credit. Primary credit is extended to generally sound banks on a no questions asked basis. Secondary credit is extended to troubled banks to facilitate a return to market funding or an orderly resolution. And seasonal credit is extended to small banks to help meet seasonal swings in deposits and loans. Lending under 10b is typically referred to as discount window lending and the interest rate on primary

credit loans is often called the discount rate. The term discount refers to how the Fed originally extended the credit. It would discount or pay the bank less than par for a customer loan. It does not imply that the loans are cheap. In fact, the discount rate is usually above market rates. The Fed accepts nearly all types of bank assets as collateral and generally banks pledge large books of business and household loans to the Fed, which are maintained as collateral despite rarely or never being used.

Currently, there was enough collateral pledged to back one point \$8 trillion in discount window loans. But, even now, banks have borrowed only \$8 billion. The Fed reports aggregate amounts of its discount window lending and all its lending and asset holdings in its weekly balance sheet release, the H41. Details on individual discount window loans, including the borrower are released to the public with a two year lag. Although discount window loans are an important tool for monetary policy, the Fed also uses discount window lending to address the liquidity problems at banks. In the past and current crisis, one of the first actions the Fed took was to lower the discount rate and lengthen the term on discount window loans, which are normally overnight to 30 or 90 days. Loans extended under 10b generally cannot have maturities of more than four months, although they can be renewed. A third, section 13.3 authorizes the Fed to lend to non-banks in unusual and exigent circumstances, that is, in an emergency.

In part as a reaction to a view that the Fed used 13.3 to bail out financial institutions, the Dodd-Frank Act restricted the Fed to lending only through broad based facilities rather than to individual entities. The lending facilities must be approved by the Secretary of the Treasury loans must be secured sufficiently to protect taxpayers from loss and loans can only be made to solve an institution. Well, section 13.3 lending has gotten the most attention, as a lender of last resort tool in the last and current crisis, the Fed used only discount window lending to respond to liquidity problems for the prior 70 years. When I started working on discount window policy in 1999 and up through 2007, I confidently assured those who asked that the Fed would never make the 13.3 loan. Details on loans extended under 13.3, including the density of the borrower must be provided to Congress within one week and to the public within one year.

Fourth, and finally, under section 13.13, the Fed can lend to anyone without restriction against treasury or agency collateral. While there is no requirement that 13.13 lending only be used in an emergency, it has rarely been used and if someone has free treasury or agency collateral, they probably don't have a liquidity problem. During the great financial crisis, the Fed authorized section 13.13 lending to Freddie and Fannie if necessary, but no loans were made. In addition to these authorities, I think the Fed should have three more. First, the Fed should be able to buy high quality commercial paper or other money market instruments. The Fed needs to be able to respond to liquidity strains and money markets. The markets where banks and bank like institutions extend credit to each other, either through direct lending or through selling very short term instruments like commercial paper. In fact, the first fallout to both the failure of Lehman and the coronavirus crisis, consisted of money funds selling commercial paper at fire sale prices.

Because the Fed could not purchase the commercial paper directly, it lent to banks and broker dealers with no haircut and on a non-recourse basis, that is, the Fed took all the risk to get banks and broker dealers to buy the commercial paper. It would have been simpler, faster and safer for taxpayers if the Fed could have simply bought the high quality and low risk paper directly. Second, the Fed should again be able to lend to individual institutions under its 13.3 authority. The restriction to broad based facilities significantly limits the ability of the Fed to respond to liquidity troubles. As I discussed in a [BPI working paper](#) published in November, the restriction can be a particular problem when the Fed is trying to work with another central bank to address liquidity problems at an international financial institution.

While several folks have observed that the Fed has done just fine without the ability to lend to an individual non-bank in the current crisis, we are not out of the wood yet. Third, the Fed should be able to keep its lending secret. For at least 70 years, the Fed has struggled with banks being unwilling to borrow from the discount window because there is a stigma associated with doing so. There was no unambiguous cause or fix for the stigma problem, but it stems in part from the discount window being primarily a rarely used backup source of

funding and nobody wants to explain to their boss or bank supervisor, why they screwed up and had to use a backup source of funding.

That problem is particularly acute when there are already liquidity strange and financial markets, because a width of illiquidity at an institution can lead to an extremely costly loss of market confidence. I spent at least a decade trying to reduce stigma and it helped to be able to say that borrowing will be kept confidential. The Dodd Frank Act requirements that borrowing be published even with a lag, makes things worse. Now, I sometimes encounter skepticism that stigma is actually a serious issue because the skeptic reasons, if the institution really needs the liquidity, it will surely borrow. The problem is that the institution will first go to great lengths to avoid borrowing, including cutting off lending to other institutions and selling assets at fire sale prices, exactly the dynamic lending is intended to stop. Moreover, often the Fed is lending to banks so that the bank will provide liquidity to someone else. If there is an intense stigma associated with borrowings, banks will simply not choose to participate.

I also think one authority should be removed although I reached that conclusion with some misgivings. In one case in the last crisis and in six cases in the current crisis, the Fed has used its 13.3 Authority to lend to a special purpose vehicle that was capitalized by an equity investment from treasury. The SPV then goes on and buys securities the Fed is legally prevented from buying. Recently, the SPVs have been authorized to buy monies, certain equities, junk bonds and participations in loans to businesses. For two reasons, I think the Fed should no longer be allowed to lend to an SPV capitalized by Treasury. First, doing so essentially fees the Fed from any restrictions leaving Congress with an irresistible means to support favorite sectors of the economy.

Second, because the Treasury is the equity investor and therefore the owner of the SPV, the Fed is lending directly to the Treasury, a dangerous and inappropriate action for any central bank. To wrap up, I'm going to step away from what should be and discuss what is. In current circumstances, the Fed should do whatever it takes, whatever it can within its legal authority, to achieve full employment and price stability as required by Congress. Currently, and for the foreseeable future, that means seeking to boost aggregate demand and prevent

problems in financial markets from contributing to further economic weakness. With inflation running below the FOMC's target and the unemployment rate projected to be significantly elevated for the foreseeable future, there is a major risk of a deflationary spiral, an outcome that could leave the economy damaged for a decade. Thank you.

In current circumstances, the Fed should do whatever it takes, whatever it can within its legal authority, to achieve full employment and price stability as required by Congress.

Currently, and for the foreseeable future, that means seeking to boost aggregate demand and prevent problems in financial markets from contributing to further economic weakness.

Cox: And thank you very much, Bill. Glad that you're able to hang with us for all of that. Interesting stuff. David, you're up next?

David Andolfatto: Thanks a lot, Jeff. Well, good afternoon, everyone. It's a real pleasure to be here. George and David asked that I discussed the merits of a Fed standing repo facility, which is an idea that Jane Earig and I promoted early last year in a pair of St. Louis Fed blog posts. In those posts, Jane and I argued that the Fed should create standing repo facility that would be prepared to lend against US treasury securities and possibly other high quality liquid assets. We distinguished the facility that we had mined from the discount window in two key respects. First, unlike the window, it would restrict collateral that consist only of high quality liquid assets. And second, it would grant access to non-depository institutions, in particular, to dealers and possibly even to all the counter parties that are presently permitted to access the Fed's overnight reverse repo facility. At the time, we were motivated by the facility as a way for the Fed to conduct monitoring policy in a manner consistent with the FOMC preferred operating framework of ample reserves, together with the FOMC's 2014 policy normalization principles and plans, which stated among other things, the desire to hold, "No more securities than necessary to implement monetary policy efficiently and effectively." Jane and I speculated at the time that a significant source of the demand for reserves over other

high quality liquid assets... that the former could be readily converted into reserves on demand and at pre-specified terms. At the same time, the facility would provide a ceiling on repo rates and eliminate the need to estimate the so-called minimally ample level of reserves. That is, the facility would basically just automatically flush the system with reserves as it was needed, for whatever reason, whether for movements in the treasury general account or for other economic reasons.

And finally, we doubted whether the facility would lead to any significant form of disintermediation, as some people feared. In our view, it would serve mainly to cap the terms of trade in a number of over the counter repo transactions involving treasury securities. Now, the title of this session is Modernizing Liquidity Provision and we're here, of course, because of the massive Fed-Treasury interventions in response to the COVID-19 pandemic. Jane and I did not tout this standing repo facility as a crisis tool, because we figured at the time that in a crisis investors were unlikely to have much difficulty in finding buyers of US Treasury securities. Since the 2008, '09 financial crisis, we've grown accustomed to the idea of US Treasury securities serving as a flight to safety vehicle. And indeed, this seems to have been the case, as the present crisis initially unfolded.

So bond yields began to drop sharply in February, and then again, following the Fed's rate drop on March the 5th, with a 10 year hitting a low of 54 basis points of March the 9th. But then something happened that I don't think anyone was expecting, certainly not I. And in particular, after March the 9th, there seems to be clear evidence of selling pressure stemming from what looked like a repo run on treasury securities. That is for a number of reasons. There was an enhanced demand for cash, which in this instance led to sales of US treasuries, off the run treasuries in particular, I understand, depressing their value as collateral. So effectively evaporating a significant portion of the supply of safe assets. And this led to additional margin calls that further enhanced selling pressure and so on in kind of the familiar do-loop.

And when the Fed cut its policy rate to 10 basis points of March 16th, bond yields just continued to rise with a 10 year hitting almost 120 basis points of March the 18th. So bond yields came down only after the Fed intervened. First, with its discretionary repo operations and then with its \$1.5 trillion of outright purchases of securities. This episode

reminds us again, I guess cash is king in a crisis, and that US Treasury securities, they're not always considered cash equivalent in a crisis. An entry question to ask here is whether disruptions like this constitute a policy problem. After all, it's not like bond traders are unfamiliar with the notion of interest rate volatility. And when I glance at the data, the ample salute size of this volatility seems more or less stable since the mid-1980s. But because the interest rate levels are so much lower today, a 50 basis point move is quantitatively much more significant in relative terms.

Now, I don't think this would matter much or be much of a policy problem if treasury security served merely as a pure saving instrument. But as we know, for better or for worse, the US Treasury has evolved over the past few decades to become an important form of wholesale currency. And in fact, it's the most important form of wholesale money out there. And in particular, it's used widely as collateral in repo, so-called shadow banking sector. Its value as collateral of course stems in large part from its perceived safety and liquidity. And most of the time, of course, the US Treasury market is very deep and liquid, except for, of course, when it isn't. And so, then the question is, when it isn't liquid, does it matter? And if so, should something be done about it?

My own views on this question continue to evolve, I should mention. They're not set in stone, but they're informed both by theory and from my own knowledge of the history of the US Treasury market. In terms of theory, what theory tells us is that in a fiat money system, like the one we are operating in there, there's no fundamental difference between account entries at the Federal Reserve and let's say at the treasury direct, for example. They're just both electronic ledgers containing interest bearing accounts. There are legal differences, of course, only depository institutions have access to fed accounts. Whereas, treasury securities can be held much more widely. And of course, treasury securities are more complicated objects because they differ from each other in terms of coupon, time to maturity and possibly other characteristics.

And so for this reason, as we know treasury securities, just like with most bonds, are traded and decentralized over the counter markets instead of centralized exchanges. Now, while OTC markets may have their advantages, after all my understanding is that bonds were initially

traded in the early 1927 exchanges, and that the OTC markets actually came to displace those centralized exchanges. Something that the Fed at the time mentioned showed the apparent superiority of over the counter markets in this market. OTC markets clearly have their advantages, but the decentralized nature of these markets also pose certain challenges. And in particular, in terms of the structure of communications and coordination.

When investors become fearful, bond dealers and other traders may become unwilling or unable to execute trades, so that meaningful price information is lost in this decentralized system. Safe assets may trade at significant discounts or premium and not for any fundamental reason, but simply because liquidity, or market participation, or communications have vanished suddenly. Such events have implications that extend beyond the treasury market because the yield on treasuries, as we know, serves as a benchmark for many other financial assets. And so, unnecessary and avoidable problems in this market can spill over into other financial markets. From this perspective then, I'm kind of led to ask myself the question, in what world does it make sense to permit risk-free claims to fiat money, like government issued treasury securities, to suddenly become illiquid?

This question is a bit distinct from a related question, which is one that asks whether risk-free claims to fiat money should be made illiquid to begin with, as in the case of the issuance of non-marketable debt. There may be some reason, economic reason to prefer issuing non-marketable debt, but to the extent that most of the debt or part of the debt is issued in marketable form. In what sort of world does it make sense to permit the liquidity of these instruments to vanish suddenly and unexpectedly? And as far as I know, I know of no theory, no model that justifies these sorts of events as being good from a social point of view. There's no good reason.

In what sort of world does it make sense to permit the liquidity of these instruments to vanish suddenly and unexpectedly? And as far as I know, I know of no theory, no model that justifies these sorts of events as being good from a social point of view.

And so, I continue to believe a standing repo facility makes a lot of sense for the US economy. And I want to stress that this is not just a hypothetical proposal. I mean, many of the world's leading central banks operate such facilities. The Fed, in fact, has its own overnight reverse repo facility that's had in place since 2013. And indeed the Fed even implemented a repo facility. They call the FIMA, the Foreign and International Monetary Authority repo facility just in March of this year, where foreign central banks can borrow funds at 25 basis points above IOER by presenting US Treasury securities as collateral.

I think that the same type of facility set up for domestic purposes and ideally with Treasury support, I might add, could simultaneously help the FOMC achieve interest rate control. It could help the FOMC shrink the size of its balance sheet, and now also prevent unnecessary and violent disruptions in the treasury market by setting a corridor around treasury yields at different maturities. The size of this corridor could ultimately be adjusted even to help achieve yield curve control, if that was desired. But this is a separate issue. Let me end here. I look forward to the Q&A. Thank you.

Cox: David, thanks so much. Good stuff. Really thought-provoking remarks from everybody. We've gotten some feedback, some questions from our viewing audience. I want to get to a few of those things. I think the general theme amongst a lot of the questions is just sort of how you do some of these things operationally and whether this is really just kind of a road that we've already gone down in some cases. We'll get to some of the specific ones. I'll start off with one for Jeremy. Jeremy, you noted the Canada has maintained strong fiscal and monetary anchors. Do you think this crisis will harm that track record or you think Canada is in a position to maintain its credibility?

Kronick: Yeah. I mean, I think fiscal anchors were certainly rightfully set aside at the beginning of this crisis. I mean, the government needed to step in with a fair amount of stimulus. And so, trying to hang on to your 30% debt to GDP target was not really realistic in the heart of this crisis, but I do think that a credible plan in the medium run for getting back to the fiscal anchor that existed before is important. Not only for those risk premiums that I mentioned, but also because it makes the Bank of Canada's job hitting the inflation target much easier.

As I mentioned during my opening remarks, we benefited from low risk premiums, but that can change on a dime. We saw it in Canada in the 80s and the 90s, borrowing costs shot up for the government and forced a really painful rebalancing of government spending in the mid-90s. And so, we don't want to go through that again. And so, I think that the right approach is sort of a medium run plan and that medium run plan also helps reduce some of the uncertainty that's out there that has perhaps we haven't seen as much uptake as some of the government programs as we would've liked.

Cox: Some of my own input on this is a running thought that I had had through all of the presentations. And you can take this, or David, or Bill if you want to jump in. These are all great hypothetical approaches to some of the dilemmas that central banking has faced. Now, I'm wondering if you guys think that we're too far down the rabbit hole with monetary policy to be able to sort of retrofit some of these things into what's to come.

Andolfatto: I'll just quickly mention that actually these things are not really hypothetical. Well, I should say the standing repo facility that I put forth was not a hypothetical. Most of the world's leading central banks actually operate these facilities already. It's kind of ... The Fed is a little bit unique and being a bit of an outlier. Perhaps, Bill would like to speak in terms of the other types of facilities though.

Nelson: Thanks, David. I mean, so I suggested a few changes, powers that should be added and at least one power they should be taken away. I think that those changes could be made. I wouldn't make them sort of in the current circumstances, when things are already pretty dire, and I wouldn't be taking any authorities away from the Fed. And I think it's got its hands full without adding anything to it. I guess it would be conceivably beneficial to add the authority to lend to an individual institution out of 13-3. But that said, I mean, I think overall the Fed has the tools that it needs to provide liquidity to the financial system.

I do worry a bit about many of the actions that have been taken recently in terms of they're going to be difficult to unravel. I particularly worry about the muni facility. The Fed has always stayed away from monies because they're so politically challenging. It's going to be hard to back away from that. I worry about the purchases of corporate bonds in the

open market. That's not clear where that ends. But all that said, Chairman Powell has emphasized again and again that the Fed has ... These are emergency authorities of the Fed and when the emergency is done, the Fed will put them away. And I sure hope that they can succeed in doing that.

Kronick: Jeff, can I add just a little point –

Nelson: Sure, absolutely. Yeah.

Kronick: Yeah. I just want to say, to pick up on something both David and Bill said. On David's point, I mean, Canada has actually term repo facilities that exist and the contingent term repo facility, which is really about certain poor financial metrics being experienced in the market before it would be turned on in the discretion of the Bank of Canada, that wouldn't take actually very much to change, to be a more market-based measure, meaning auction and adding some financial institutions to the eligible counterparty. So I actually don't think it would take all that much to add to some of the facilities that I was mentioning. You can make part of the more permanent toolkit. And then just a point on what Bill was saying with the Fed. In Canada, I mean, like I said, the bank out's quite clear on these powers that the bank has in extraordinary circumstances.

And so the question really is, do you want to try and mitigate some of that credit and political risk? And one of the ways to do that, as I mentioned, would be for the Bank of Canada, once it has intervened, to exchange those assets with federal government debt instead. For that to happen, the Federal government of Canada would have to open up account in the public accounts to hold those assets, but it actually wouldn't take too much to do. But I would agree that you don't want to do it in the middle of the crisis. This would be something for consideration afterwards.

Cox: Okay, great. Thanks. Bill, I'm going to come back to you. This is a viewer question; the Dodd-Frank prohibition of direct loans to specific institutions was meant to draw a line on too big to fail. Could you comment on how the too big to fail moral hazard can be addressed without that prohibition?

Nelson: Yeah, I'd be happy to. So in fact, there's been extensive work over the past decade to make sure that no institution is too big to fail. And in particular, there have been elaborate changes to the way the law treats the failure of an institution and the way institutions stand in relationship to each other that should make a failure of an institution, even a large institution, sufficiently low cost that it can take place. And if you look in market prices now, you can see that there's a pretty hefty risk premium built into large and small institutions. It's not hefty now, it's come back quite a bit. But nevertheless, the risk premiums of large and small institutions both responded to the recent stress in a way that you would expect if institutions were perceived as not too big to fail.

I'd add that the Fed has traditionally, as I mentioned, used 10B through the discount window for 70 years to handle liquidity problems. And there's no restriction on 10B to lend to an individual institution, no restriction on 13, 13, no restriction on section 14. So for all those reasons, I think that too big to fail is not so much of a problem anymore. And I don't think that having the ability to address a liquidity problem rather than a solvency problem at a large institution will add to it. One last point, there are plenty of restrictions that were also added by Dodd-Frank into 13, 3 that would be helpful. So in particular, the Fed can't make a loan that isn't collateralized sufficiently to protect taxpayers from losses. It can't make a loan to help out even on a broad-based facility to help out an insolvent institution get out of its trouble.

Can't make a loan to take bad assets off the books of a bank. So I think there are plenty of changes and all of which as a package, would be sufficient to make sure that no individual institution would be bailed out. Thank you.

Cox: Okay. Terrific. Thank you, Bill. David, this is for you. Can you say a little on the question of what counterparties should be allowed to take part in the standing repo facility and how you keep it from crowding out private repo transacting in normal times.

Andolfatto: Well, yeah. Sure. I think at the minimum, dealers should be permitted access given the present regulations and institutional structure, and possibly many other counterparties. I mean, this is actually a debate that crops up every 50 years or so at the Fed. I've been learning slowly from my readings of Kenneth Garbin, for example, that

writes extensively on the history of the treasury market and the emergence of the dealer system. So about 70 years ago, there was a big discussion on exactly this question. I mean, who should be permitted to have access to the Fed? I think the dealer banks, for sure. All depository institutions, possibly. Also, like I mentioned in my talk, all the institutions that presently have access to the overnight reverse repo facility. I mean, why not?

In principle, from my perspective at least, the more counterparties the merrier, although I can appreciate this might lead to some difficulties in some other dimensions. But in terms of crowding out, I mean, I don't know. I mean, I'm a bit skeptical. My understanding is, these are over the counter markets. There's no single rate that governs this market. These are heterogeneous trades, there's different terms of trades. There's a distribution of interest rates. And from my view, I think that what a facility would do is necessarily disintermediate trade, although it could a little bit, but it would serve as a credible ceiling on the interest rate that a particular counterparty would be willing to offer or to get. So in other words, it's basically going to, I think, serve as a threat. A threat that would govern the terms of trade of the actual repo transactions that do take place out there.

And to the extent that a trader cannot find a counterparty, I guess the facility provides an option that this trader can now approach the facility and execute a trade that would not otherwise have occurred. And I don't count that as crowding out, I count that as the facility actually permitting the trade to occur that would not otherwise occur. So color me a little skeptical on the disintermediation part, although I stand willing to be corrected with any empirical evidence, if people have it. Thank you.

Cox: We have another general question here from the viewership, and whoever wants to jump in on it: All serious bank crises result from either misperceived risk, like 2008's AAA rated securities, or unexpected events like the pandemic. I guess, to qualify this question with, we don't know whether we're in bank crisis or whether we're heading in that direction. But the question is, why keep risk-weighted bank capital requirements based on the perceived credit risks? Bill, you want to grab that?

Nelson: Sure. I'm sorry. I cut out and had to come back in. I guess the question is why have risk-weighted requirements rather than say a leverage ratio requirement, is that right, Jeff?

Cox: Yep. Yep. Exactly.

Nelson: So I actually think leverage ratio requirements are a really bad policy. So leverage ratio requirements, also weight assets, they just weight all of them equally. So it's sort of just a particularly bad effort at risk weighting assets. I mean, currently the capital requirements of institutions in addition to a leverage ratio as a backstop is determined in part by the bank's capital to risk weighted assets by the capital that it has in order to meet stress in a severe downturn as tested through the stress tests. And for many institutions, it's also done through, not just standardized weights, but through weights that are based on their own projections of risk. I think that this system seems to work remarkably well recently with institutions coming into this crisis with a lot of capital that served them well, allow them to keep lending and actually been a source of strength in the crisis.

By contrast, when the Fed, for example, passed the leverage ratio, most recent leverage ratio requirement, the SLR, everyone on the board made it clear that they only were doing so because they anticipated that that regulation would be a backstop because when a leverage ratio is the binding requirement, it has very unattractive properties. In particular, any institution that has to hold equity against assets, regardless of the amount of risk, will choose to hold a riskier portfolio in order to maximize sort of profit per unit of capital. Moreover, as we saw on the crisis, it's undesirable to have institutions be penalized for holding low risk assets like treasuries and reverse repos of treasuries. Being penalized and making it costly for institutions to hold those assets are exactly what contributed to the gumming up of financial markets in mid-March that made even treasury securities, the world's most liquid securities momentarily illiquid requiring the Fed to buy a trillion dollars' worth of treasury securities within three weeks.

So I guess I hold a quite different view that I think there's no evidence at all that the current situation was worsened. If anything, it was made better by risk-weighted requirements and by stress tests that are

effectively a very sophisticated way of implementing risk rate of capital requirements.

Cox: Super. Thank you, Bill. We have time for maybe one or two more questions. Jeremy, I'm going to come to you on this one. It's a question about the mechanics of what you had spoken about. What would the multiple asset auction design you discuss look like in normal times? Particularly, how would emergency unorthodox purchases unwind or would they have to be held until maturity?

Kronick: Yeah. I mean, so again, we have examples out there of the way the bank does the auction right now that actually don't differ a ton from what I was recommending, right? So really what I'm saying is what you want is for the bidders to essentially tell you their complete demand function. Then what you want on the supply side is to ensure that the pricing you're receiving is as competitive as can be. And so I'm not actually sure that the mechanics would be that much different because you could still use discriminatory pricing, which is the idea of sort of that descending yield that I mentioned. It would just all be above a certain cutoff that the auctioneer would have to determine once it receives all the bids. And so I don't know that the mechanics would take all that much to change from what is currently being done by the bank of Canada. And Jeff, I just missed the second part of the question, the part about the unwinding.

Cox: Yeah. It was just the question of, you basically have to hold to maturity or would they be allowed to unwind into the market?

Kronick: So we're not talking about extending the term too much, right? I think you're talking in that one to three month period. So my guess, it would just be held to maturity and then unwind naturally. I mean, that's, I think, the optimal way to go because then the bank doesn't have to venture into selling in secondary markets. I think it's a lot easier if it just unwinds off the balance sheet naturally, which it should, if we're talking about that one to three month term.

Cox: Thank you so much. We are close to the end here. I think I'm going to turn it back over to George to deliver a couple of closing remarks. And I want to thank everybody for participating today. Great discussion

and thank you to the panelists and for all of the people who tuned in today. And back over to you, George.

Closing Remarks

George Selgin: Thanks, Jeff. And thanks to all the panelists. Everybody, please join us for our final installment for next time on preserving monetary autonomy. And that's on Thursday at the same time as today's session.

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