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Opening Remarks:

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COVID-19's Impact on State & Local Budgets and the Muni Bond Market:

DAN BERGSTRESSER, Moderator
Brandeis International Business School

Flight to Liquidity or Safety? Recent Evidence From the Municipal Bond Market:

Authors:

HUIXIN BI
Federal Reserve Bank of Kansas City

BLAKE MARSH
Federal Reserve Bank of Kansas City

Discussant:

BRAD WENDT
Charles River Associates

The Option Value of Municipal Liquidity: Evidence From Federal Lending Cutoffs During COVID-19:

ANDREW HAUGHWOUT
Federal Bank of New York

BEN HYMAN
Federal Bank of New York

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Federal Bank of New York

PARTICIPANTS (CONT'D):

Discussant:

MELISSA MOYE
U.S. Treasury

Mutual Fund Fragility, Dealer Liquidity Provisions, and the Pricing of Municipal Bonds:

Authors:

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Discussant:

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Limits of Disclosure Regulation in the Municipal Bond Market:

Authors:

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PARTICIPANTS (CONT'D):

Discussant:

EMILY SWENSON BROCK
Government Finance Officers Association

Panel Discussion:

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DAVID WESSEL
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Panel:

MARC JOFFE
Reason Foundation

KIMBERLY MURNIEKS
Ohio State Office of Budget and Management

BRIAN SIGRITZ
National Association of State Budget Officers

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P R O C E E D I N G S

MR. WESSEL: Good morning, or wherever you are, good afternoon. I'm David Wessel, Director of the Hutchins Center on Fiscal and Monetary Policy. I'd like to welcome you to the 10th Annual Municipal Finance Conference, jointly sponsored by the Hutchins Center, the Rosenberg Institute of Global Finance at the Brandeis International Business School, the Olin Business School at Washington University in St. Louis, and the Harris Public Policy School at the University of Chicago.

This year we are spreading the conference over three days, today, Tuesday, and Wednesday. Hopefully, next year we'll be together in person. Today, we're going to focus mainly on the impact of COVID-19 on state local finances and the municipal bond market. Tomorrow and Tuesday, we're going to focus on recent developments in the muni bond market, and then on Wednesday, we are going to have a focus on state and local infrastructure and how it's financed.

You can participate in this conference by posing questions on Sli.do, S-L-I.D-O. If you put in

the hash tag, munifinance, it's kind of like Twitter, you send us a question, we'll see them and, where possible, we'll pass them along.

Before we turn to today's session, I just want mention that Wednesday afternoon at 1:30, we're planning some discussion groups that are open to everybody. One on state local sector fiscal issues and one on the municipal bond market. The Zoom links for those are on the website for this conference as are the texts to the papers, the slides, and, eventually, the videos will be there as well.

I'm now going to turn the program over to my colleague and friend from Brandeis. Dan Bergstresser is going to moderate the first panel. I'll be back at 2:15 with a panel to discuss state and local fiscal issues. So, over to you, Dan.

MR. BERGSTRESSER: Great. Thanks for coming. We will have four papers this morning. Each of these four paper blocks, the authors, are going to have 15 minutes, discussants will have 10 minutes, and then we'll have Q&A for 10 minutes. And so, please go online to the Sli.do site to submit any questions that you have

or comments that you have for that Q&A part of the event.

The first paper is by Huixin Bi and Blake Marsh of the Kansas City Fed. Dr. Marsh will be presenting this paper. Brad Wendt of Charles River Associates will then have 10 minutes to discuss it. The first two papers will be presented back to back and then we'll have a 10-minute break, and then we'll have the second two papers after that. So, without any further ado, I'd like to turn it over now to Dr. Marsh to present the first paper.

DR. MARSH: Perfect. Thank you very much. So, thanks for the intro. It's my pleasure to join you all today. I going to be presenting joint work with my colleague at the Kansas City Fed, Huixin Bi today. And I want to thank the organizers for having us and our discussant for what I'm sure will be helpful comments.

So, as a Federal Reserve employee, the usual disclaimers apply which I'm sure you've all heard. These are my own views and not views of the Kansas City Fed or the Federal Reserve System.

So, I'm going to start by examining some of

the dynamics that affected the muni market in March 2020. So, on the one hand, there was a broad financial panic. So, March 2020 was characterized by a dash for cash, some call it. And during this time, trading conditions across financial markets became stressed. So even typically safe asset markets like treasuries and munis experienced distress. And in short, across financial markets, selling conditions became strained and market liquidity dried up.

So, these conditions, we believe led liquidity premia to increase sharply on muni bonds. But, on the other hand, state and local governments were also on the front lines of fighting COVID-19. So COVID required S&Ls to deploy more resources which, of course, requires more revenue. But because of the panic and the economic shutdown, revenue projections were declining.

So, for two examples, business activity was contracting, so the tax base was at risk of shrinking through business various (phonetic) and otherwise. And then affluent households' joblessness was rising which raises the possibility that tax obligations could actually be in arrears. And so these conditions lead to

concerns about the risk (inaudible) rising for S&L muni issuers. And the confluence of the two, the credit factors and the liquidity factors, caused bond yields to rise very sharply during mid-March 2020.

And so these conditions lead to concerns about the fallgorus (phonetic) rising for S&L muni issuers. And the confluence of the two, the credit factors and the liquidity factors, caused bond yields to rise very sharply during mid-March 2020.

So, in response to the financial panic and just the general disruption of economic activity, Federal authorities took bold steps to buoy the economy. So, the Federal Reserve embraced its lender of last resort role and engaged in aggressive monetary policy.

On the U.S. fiscal side, the U.S. government enacted policy support measures and many of these actions indirectly supported muni markets. And, in fact, some of them directly targeted muni markets. And so I want to discuss a few of these in turns, paying careful attention to the timeline here, which is going to factor into some our later analysis.

So around the third week of March, the Federal

Reserve introduced the Money Market Liquidity Facility, or the MMLF. So, this facility accepted securities held by money funds in exchange for short term loans. And on March 20, the eligible collateral set was expanded to include certain municipal bonds. And then it was expanded again on March 23 to accept variable rate demand notes. And the purpose of this facility was to provide liquidity support to one of the large institutional holders of muni bonds.

So around the same time, between March 23 and March 27, Congressional negotiations were also taking place over the CARES Act. So, indirectly, the CARES Act provided support to state and local governments, indirectly to the muni bond, provided support to state and local governments as well as businesses and households. So this helped support the tax base, but it also provides funds directly to those local governments, so they don't have rely on external financing, perhaps.

But more directly to the muni bond, the CARES Act authorized the creation of the Municipal Lending Facility. So, this facility was administered by the Federal Reserve, backed by the U.S. Treasury, and the

facility was authorized to purchase relatively short term bonds directly from muni issuers, so the Fed actually becomes, in this case, a buyer of last resort, which is quite unique.

So, what we want to do in this paper, is we want to ask a very fundamental question about the muni bond pricing dynamics during this time. First we want to know how investors re-priced this credit and liquidity risks, but more directly to the interventions. We want to know, how did they affect the pricing dynamics.

So, of course understanding credit liquidity risk is a very fundamental thing in any bond market, but trying to separate the two components is a difficult task to do empirically. And so what we want to do is use a fairly parsimonious framework. And so we were going to rely on pre-refunded bonds to try to gauge liquidity risk in the market. And this is a (inaudible) commonly used technique in the literature.

So, just as a refresher, a pre-refunded bond is a bond -- so you issue a refunded bond. Those proceeds are stored in a treasury-backed escrow account.

The cash flows mimic the bond payments on the pre-refunded bond. And so the pre-refunded bond essentially becomes fully collateral. It shouldn't be subject to any credit risk, but it is subject to liquidity risk. And so, we can get a sense of the credit risk premia by comparing the spreads on the pre-refunded and the non-pre-refunded bonds.

So, our research design is going to rely on comparing the pre-refunded, non-pre-refunded bond spread before the intervention and after the intervention. If we see higher pre-refunded bond spreads after the intervention, that tells us that investors are pricing in some sort of credit risk premia, more so than they would have before the pandemic.

So, before I move into the actual results and the modeling, I want to try to highlight our main result just using very simple plots of average yields from our sample. So, the highlighted portion on this slide shows that prior to the financial panic and the interventions, the pre-refunded bonds -- the period is shaded by gray -- the pre-refunded bonds, which are shown in orange, had the lowest yields among traded bonds, which reflect

their lack of credit risk. The short term bonds, which are shown in green, have a slightly higher yield, which we think reflects a non-zero credit risk premia above the pre-refunded bonds.

And then the longer term bonds have the highest yields, which reflects the credit risk compared to the pre-refunded, but because they're long terms bonds, there's also some interest rate and inflation risk compared to the short terms bonds. So, we think there's some term premia component in the blue line.

So, on this slide, we've highlighted the segment that shows the height of the market panic, so between the time spreads are rising and the intervention, the last intervention takes place during March 2020. So, we can see first that yields climb for all three bond types. The pre-refunded bonds, in particular, increased about three times above their pre-crisis levels, which reflects severe liquidity problems in these markets and financial markets more broadly.

The short term yields, in green, increased above all the other bond types, and so we think that this does reflect liquidity challenges, but at the same

time, the increased premia above the pre-refunded is indicative of heightened credit risk concerns.

And we think these might come from two places. So, first is that the pandemic in March was perceived to be somewhat temporary, which put increased pressure on short term debt. But, second, there were tax extension deadlines during this time that pushed back revenue collection dates, which makes the fall from these very short term notes more likely.

And then, finally we can see that long term bond yields also spike, but it's hard to tell exactly what's going on here just from this picture. So, the analysis will help us unravel that.

So, on this slide I'm showing a shaded portion that highlights the months immediately after the interventions by the Federal government and the Federal Reserve. The most obvious takeaway here is that yields retreated significantly across all three bond types. And our sample ends just at the end of May, so it's not a very long time after the interventions. And we interpret the decline in pre-refunded bonds here is evident that the interventions address market liquidity

concerns. But the yields on short term bonds also returned to more normal pre-pandemic levels, but the longer term bond yields, however, appear to be higher than they were prior to the interventions, prior to the pandemic, which we think likely reflects a lack of policy support toward the longer term bond market, but also expectations of a longer duration panic. So, you have less support and more for credit risk.

So, these plots are illustrative of our hypothesis and our findings, but they don't let us control for bond or issuer characteristics. And, ideally, what we want to do is we want to compare bonds that are pre-refunded and non-pre-funded among similar issuers, similar maturities, and similar dates. And so, to do this, we're going to start with a simple event study that compares yields on bonds just before a policy intervention announcement and just after.

We're going to use a sample of highly traded bonds, so they can be traded on both days. We're going to compare the bond itself before the intervention and after the intervention, and then we're going to take it another step and we're going compare the pre-refunded

and the non-pre-refunded sample averages, to look for credit risk.

So, the chart on this slide showed the estimated impact of each intervention on muni bond yields for each day. And this is controlling for bond issuer and trade characteristics, and the bars of the 95 percent confidence stands around the estimate. So, what we find here is that there was no immediate impact on yields following the earliest of the Federal Reserve interventions that occurred on March 20 and March 23. These are the two left-hand dots.

But, again, what we're looking for here are very short term immediate impacts. So these are basically announcement effects the -- interventions are so closely clustered together, we have a hard time separating them out over longer periods.

But I think what this illustrates is that the scope and the depth of the market turmoil was increasing during this time, since we see these yields increasing even with the market intervention. But later, as we see more positive news about interventions that were going to offer more comprehensive support to the muni market,

we find lower yields that fell more immediately on the news.

And so, for instance, if we look at the middle three days, we can see that on March 24, when the CARES Act agreement was announced between the White House and Senate leadership, so this made it plausible that an agreement was going to be passed. We see a 30 basis point decline in muni yields. A couple days later, on March 16, the CARES Act actually passes the Senate, which, in some respects, was its biggest hurdle. So, this reduces yields an additional 60 basis points. And the final enactment of the CARES Act on March 27 corresponded with the decline in yields of about 30 basis points. And then, finally, on April 9, we see that the announcement of the Federal Reserve creating the MLF resulted in another 15 basis point decline. So these more direct measures that are pointed toward credit risk seem to have bigger impacts.

So we're going to look at this directly, though, and see how much progress was moving immediately on the announcement. So we look here at this table for these differential impacts on non-pre-refunded bond, so

we see an additional decline for non-pre-refunded bonds. That would indicate that these interventions had immediate impacts on credit risk.

The second row of the table in red shows that, among CARES Act events, nearly all of the impact affected bond segments equally, and we don't find any significant impact on bonds that are not pre-refunded. And so we think the immediate impact of these announcements was to basically return the market to more normal functioning.

So what we just did, let's us control for point (phonetic) factors, but it's really not set up to estimate these cumulative effects of the intervention. And so to do this, we're going to run a regression that compares pre-refunded bond yields to longer term and shorter term yields on each trading day of our sample, and that's going to give us a daily estimate that we can estimate this non-pre-funded premium, and we can see how it evolves over time. And, again, we can control for characteristics of bonds and issuers.

So, we're going to look at short term bonds first. The solid line in the plot shows the average

yield differential for bonds with less than one year remaining maturity and pre-refunded bonds that don't face credit risk. The blue shading is the 95 percent confidence band around these average estimates.

So, what we see here is that the yield differentials compared to non-pre-refunded bonds, they peak during the crisis. So, around mid to late March, that's where see the highest credit premium. But following the interventions, they fall pretty quickly and they fall to more normal levels. So, we think this doesn't reflect the improved market liquidity, but it also reflects the fact that the interventions were aimed at short term bonds, because both the direct fiscal transfers increased the probability the issuers consider this existing debt. But the MLF also gave issuers a buyer of last resort should they need to roll over debt.

So, next we're going to look at the comparison between longer term non-pre-refunded bonds and pre-refunded bonds. In this case, we see that the yield premium on longer term bonds actually didn't increase very much, if at all, during the height of the crisis. But after the interventions, we see the differentials

rise steadily through the end of our sample.

So, I think that this reflects two facts. It reflects the fact that longer term bonds were less targeted by the intervention policies. They were never geared at rolling over long term debt or addressing short term debt, but also this realization that the pandemic would be more than short term event. So, longer pandemic puts longer term revenues more at risk.

And so, with that, I just want to conclude by summarizing our main findings again. So, we find that policy interventions, particularly those with fiscal backing, had a substantial impact on muni bond yields. But they seem to be contained to restoring market functioning and reducing liquidity risk premia immediately. But we find little evidence of additional declines on bonds facing credit risk. But over the cumulative period, we find that credit risk concerns shifted during the pandemic. This is consistent both with the nature of the pandemic and the design of the support policies.

So, specifically, we think credit risk were important driver of rising short term bond yields in

March 2020, but not longer term bond yields. But after the interventions that addressed a lot of the short term bond concerns, we find that credit risk premia fell for those bonds and increased for the longer term bonds, reflecting the longer term nature of the pandemic and the limited support for these bonds.

So, this concludes my presentation. I'm happy to take any questions and look forward to the discussion.

MR. BERGSTRESSER: Great. Thank you very much, Blake. I want to turn it over now to Brad Wendt of Charles River Associates to take 10 minutes to discuss the paper. Brad, I think you're going to need to unmute yourself.

MR. WENDT: Blake, you can take your slides down, that would be great. Super. As CRA is probably known as the advisory committee, has the good fortune of reviewing a slew of outstanding papers that are at the conference every year. And when I saw this paper, it's one that really caught my eye, because personally I was at the U.S. Treasury at the time serving as a senior advisor to the undersecretary and myself, and Melissa,

who's on this panel, we lived through this very interesting period. And I really don't want to use the term prices because I think in everyone's heart, it was a liquidity situation, not a price situation.

And if we look at the CARES Act, the CARES Act is crucial in terms of an underpinning that Congress put in was no taxpayer dollar could be put at risk which is diametrically opposed to the (inaudible) session.

So, Blake, with that in mind, is it fair say that your research shows that, in fact, regardless of the ongoing impact on a negative basis the pandemic has had [00:20:01] the world economy, at least the data that you reviewed, it was really more of a liquidity crisis. You didn't near a term (phonetic) ever being a credit crisis. Just wanted to hear your thoughts on that, in terms of perception.

DR. MARSH: Sure. So, I think what we're trying to do here, is sort of hold the liquidity factors constant. So, it's hard to pin down both credit and liquidity at the same time. So, what we've chosen to do here is hold the liquidity factors constant and which would help credit premiums varying over this period.

So, we do find evidence that credit risk premia were rising, first for the short term and then for the longer term. With that said, I think if I take signal just from the first graph that I showed, which is just the average spreads, assuming the pre-refunded aren't really facing material credit risk, the fact that those spreads -- or the fact those yields lows three or four times above what they normally are, would be indicative of the fact that there was very a severe liquidity problem. And just looking at the graph, it seems like, at least early on, that was a major, major component of what was happening.

MR. WENDT: Once again, the notion that we had two types of policy impact your fiscal obviously being legislative and then the Federal Reserve being monetary, from your perspective was one more effective than the other? Or is it important that the U.S. government and the taxpayers had both in their back pocket in terms of tools by which to address the pandemic crisis both near term and long term. For the audience, how do you perceive the value of restart (phonetic) the fiscal and monetary policy actions?

DR. MARSH: When I think about which one was more effective, I have to be careful here, right, not to get myself in trouble. But I think early on, I mean, the crisis kind of -- or the panic sort of came suddenly, right. And the Federal Reserve had tools that they had used in the previous great financial crisis. And they used those tools quickly. But I think, like you said, everybody is concerned about risk to the taxpayer and credit risk to the institution and so on and so forth. And so, historically, I think central banks have been reluctant to step in and take credit risk in the midst of a panic. It's just about sort of getting the market flowing again, right.

And so, the CARES Act, you know, it really did two things, I think. It relieves those credit risks by just sending money to state and local governments so they're not reliant on the bond markets to potentially raise funding at a time when it's very expensive. But that also helps with the credit risk perceptions. But it also gives the Federal Reserve a little more latitude to take on credit risk, at least short term. And so, I think that's important to the muni issuers because if

you're concerned about the fact that you may need 30 days or six months say of financing when you're not collecting revenues, you can just borrow it at a reasonable cost and then re-pay it when the tax receipts come in. And I don't think that really would have been possible without the backstop provided by the CARES Act.

MR. WENDT: I agree. I think history is such that the backstop really was not necessarily hit that often, if at all. But, honestly, just the public perception and (inaudible) perception, it was available for liquidity and (audio drops). So, before reading your paper and we've had multiple conversations, I think the exciting thing about your paper is it really proves what all of our gut instincts told us on day one.

People in the audience lived through the great recession of 2008, 2009, 2007, and we knew that was a credit crisis. And, obviously no one knew the playbook for a liquidity crisis where it had a long tail on it, and fortunately the tail is not as long as it could have been. But for you to have gone through the, what I would call, a two-and-a-half week period which people worked in the Fed, worked in Treasury, worked in the

marketplace, I think just seems like a complete blur and be able to go day by day, I just want to compliment you on the research you did that really proved what we thought would be the correct tool. But now, at least, I think one takeaway of your paper, Blake and Huixin, is the fact that you have a proven toolbox based on the data from the MSRB, municipal trades. Just, I want to compliment you, but I want your thought process on the validity of actually having created a process by which, if a similar situation were to occur, that we actually think we know what to do this time, as opposed to we think this should work, but there is no -- it's never been done in the history of the marketplace for municipals.

DR. MARSH: I appreciate the -- go ahead.

MS. BI: Sorry. I just wanted to add one comment is that I agree that credit risk definitely is a big component. So, we look at the (inaudible) that accumulated. Those lowered the credit risk by 130 basis points. Versus later on, we show the credit risk, it changes by 20 basis points. So, certainly credit risk is a big component.

And also, fiscal measures are very important. But also I think it helped particularly in perspective. The CARES Act is unprecedented, in terms of magnitude and the size. So compared to that, you know, the Fed is (phonetic) intervention too. The scale is smaller, so I think that's also come to view to the very distinct impact the CARES Act was it the direct intervention or indirect intervention (inaudible)

MR. WENDT: Blake, you were ready to say something?

DR. MARSH: Yeah, I'll just take one minute to address your last comment and question. So, thank you for the very kind comments on the paper. I think we do want to be a little bit careful in what we're trying to say that we found here. So, like I said during the presentation, the fact that the interventions are coming along so fast, so it's almost like you have one every day for two weeks. We really can't do more than say that something changed today that was different yesterday. And so, you know, what is the cumulative impact of the fellows (phonetic) that are rolling out the money market liquidity facility? I really don't

think our analysis can speak to that. But we can say, in totality, that these policies had a big effect, I think, on the markets they were geared toward impacting.

MR. WENDT: I agree. My takeaway is if you only had either the Fed or the U.S. Treasury with Congressional authorization working on this, they're independent tools, certainly there wouldn't have been a solution, at least from your data, return to the marketplace, some say to normality within (inaudible). Once again, I know how much work you put on data slicing and dicing. And the data's very good, so I'm very pleased to have this piece of academic research in hand for, hopefully, no one to use in the future, I hope we don't go through another pandemic. (Audio drops 27:36.) So with that, I certainly questions from the audience, advanced to moderate questions.

MR. BERGSTRESSER: Great. And just making sure -- so, Blake, Brad, Huixin, can you guys hear me okay as I'm moderating? In spite -- some of the questions that been put on the Sli.do platform. So a reminder that we're using the Sli.do platform to receive questions from the audience. So, I think this is a

fantastic paper, and I'm grateful for the evidence here.

One thing I wanted to probe on a little bit was, when I think of municipal spreads at different maturities. I think it's a convolution of four different things. You've got credit, liquidity, but then you have the expected future evolution of tax rates. And then you've got options. You've got sort of optionality. And I'm curious, can you separate out, when you're looking at long term versus short term, the impact of changing future expectations of tax rates and also did you try looking at measures of spread or option adjusted spread instead of just yield in your work?

DR. MARSH: So, we did look at spreads. All the results kind of stay, you know, we look at a spread in reference to say Treasury yields, comparable Treasury yields. I think I'm going to punt the tax expectations question over to Huixin.

MS. BI: Yeah, so that's really to the point. We did not specifically look into the tax expectations and (inaudible) bound to do that. That's a really good point. But I guess what we're asking here is that we are comparing enough people in the short period of time,

the fact the tax rate is going to change compared in the short run (inaudible). Unless that has happened we kind of take that -- I guess our assumption is that there is not immediate expectation changes in the short versus the longer run, the tax is very different. But that is certainly (inaudible). The cost would be (inaudible). I guess one we're trying to capture here (phonetic).

But to the extent investor thinks the state has to raise tax much higher in the longer run. So that would be incorporated in (inaudible) which we're kind of assuming the short versus the longer run. There's no changes in that expectation. Yeah, that's something certainly -- that's a really good point and we should take into consideration.

MR. BERGSTRESSER: How would, if you extract from your work a measure of liquidity stress in this market. You can sort of separate off kind of -- I love looking the high frequency pre-refunded versus not pre-refunded as the index of liquidity stress. How does that, at the high frequency, how does that measure seem to line up with other measures of liquidity stress that people have used while looking at fixed income or other

markets. If you compare it to the Treasury on the run, off the run spread, other measures, you know, market, high frequency market price and liquidity. How do these things line up together?

DR. MARSH: So, just over our very short sample, I mean, you could see from the plot that I showed that the pre-refunded yields were very high which was kind our indication of liquidity. So, it's like I mentioned. But what we know at this time that the Treasury market functioning had some very severe issues. So, if you look at something like that, a G spread, on/off run spread, those were also very high.

I guess one thing we still need to kind of figure out is, is the liquidity risk associated with pre-refunded bond because they're backed by these Treasury securities? Is it actually related to the Treasury market itself, or is this something specific to the municipal bond market that's going on? But I think, at the end of the day, everybody just wanted to be in as liquid, cash-like asset as they could get into and that was driving a lot of this. And I think we're going to hear later about some of the issues that occurred at the

money market funds that were holding these as well.

MR. BERGSTRESSER: Is there anything -- and I realized I'm putting you on the spot a little bit here, as somebody who is employed by the Federal Reserve System. Speaking purely for yourself as the authors, is there anything that you would have done differently in the design of the various interventions that the Fed was involved in during this period? If you can answer that.

MS. BI: I can start with that. So I think, given the circumstances, I think the Fed had done best. Of course, we can always learn from this episode going forward. But because even say the MLF was backed by the CARES Act -- I mean, without the backstop up from the Treasury, it would to be very difficult for the Feds to have that facility to take, potentially take part of the credit loss. So maybe going forward that -- and that's a part of a (inaudible) going forward. How we can avoid this facility in the future, when we have another crisis (phonetic) and what a lesson we can learn about it. So, I think at a time, and think of the prices we learn the lesson from the great financial crisis and then we use that. And also that said, you know the -- hearing that,

is a sign the magnitude is massive, right. So, to some extent, it's not quite as fair to (phonetic) compare the CARES Act, the announcement impact to the other interventions in that regard. So, I think the Fed has done a really good job on that, but I think (inaudible) the lessons we can be learning going forward.

MR. WENDT: Dan, if I could just add something from my personal experience, having spent 30 years in municipal finance and people knowing, Gregory, myself, Melissa, my (inaudible) colleague at the time. We feel that no lack of calls in terms of trying to be a receptive ear to the broker dealers who were having substantial inventory problems in terms of kerig (phonetic). And the first facility as everyone knows was really just a collateral facility to the money market accounts that really didn't address the issue. And what addressed the issue was the ability to have the MMLF, The Money Market Liquidity Facility, put in place and what I'd like to underscore, and that's why I enjoyed reading the paper so much, it proves that it works, was within a two-week period, it was two people who did it. It was the Congressional authorization and

the Fed. Without those two components, it would never have been done because of the respect of authority.

So, I think could they have done something different? I don't think they could have done anything different because it worked perfectly, and the startling thing was, I think, about page 9 on their charts was, you saw the 60 basis drop when the CARES Act was passed. And that was due to very specific legislative action, fiscal action. But that action could not have been put in place without the Federal Reserve full cooperation. Once again, I think it's really a success story, and the data bears out it was a success story for the municipal marketplace.

DR. MARSH: If I could just add -- I'll guess I'll say first, Huixin and I were not involved in designing any of these facilities. So, this is -- these are purely our comments. But, you know, maybe just abstracting from what I said that this was short term, long term, is being a little bit unfair. I mean, I think about long term as sort of the bulk of the muni market as in that 10-year plus type of range, right, if it's funding infrastructure and things of that sort

The MLF actually accepted -- they kept changing it through the summer. But they ended up accepting, I think, up to 3-year issuance, which is quite a long time, when you think about how long can something sit on a Fed balance sheet before it rolls off or something like that. So, I mean, like Huixin said, I mean this is very unprecedented, both in the amount of support that was offered but also the type of support that was being offered.

MR. BERGSTRESSER: Another question has come in in the Sli.do forum. Did you look for different responses between taxable and tax exempt bonds? I apologize, this is similar in spirit to the question that I was asking about taxes. Did you try anything where you sort of separated the sample that way?

MS. BI: Yeah, we took a look at -- we have kind of like only have five months data. So, it's kind of difficult for us to slice the data too much. The majority of the bonds deal with geobonds. The majority of bonds is tax exempt in that regard. But we probably could do a little more digging into the data (inaudible) 10-year bond -- 10-year data right. It's going to give

us a much larger sample (inaudible)

MR. BERGSTRESSER: This might be the last question that we have for before we transition to the next paper. But a question has come in in the Chat. Given that the MLF, you know, that part of things targeted the primary market. Do you have thoughts about mechanisms for the flow of -- specific mechanisms for the flow of support from sort of primary market to secondary market?

DR. MARSH: So, I think, for me, the primary mechanisms is in that short term data where we saw the credit premium rising during the biggest part -- the most, I guess, most acute part of the panic. So, if you're concerned about an entity or an issuer defaulting within the next three or six months, the MLF gives them a way to basically roll over that debt. And I think that's just -- what's going on there is that nobody else wants to buy the issuance, at least the Federal, and you can pay down the existing issuance. It gives you another like one, two, three years, something like that, to figure out what's going on.

MR. BERGSTRESSER: Great. Any last thoughts

that you want to give before we transition to the next paper?

DR. MARSH: Not for me. This was great. I appreciate all the questions, and thanks Brad, for the discussion and the comments throughout, and Dan for moderating.

MR. BERGSTRESSER: Thank you very much Huixin and thank you Blake, and thanks to Brad for providing a great discussion. I want to transition now. We have the second paper of today's part of the event is by a team of researchers this time from the Federal Reserve Bank of New York. We have Dr. Ben Hyman, who is here to present the work. Melissa Moye of the United States Treasury is going to be the discussant for this work.

Again, the timing is going to be the same as we had with the previous paper. We have 15 minutes for the authors, we've got 10 minutes for discussion, and then we have 10 minutes for Q&A. And reminding you again, you can pose your questions in the Sli.do forum using munifinance as the hashtag. So, without any further chat from me, I'm turning it over now to Dr. Hyman from New York. Ben, you're going to need to

unmute yourself.

DR. HYMAN: Got it. 'Course. Thank again. So thanks for the introduction. It's a pleasure to be included on the program, and we're really looking forward to your feedback. So, similar to the previous paper, our goal in this paper is study of value of emergency municipal liquidity when government budgets are under extreme distress. And towards this end, we'll be evaluating the extent to which Federal sectors municipal liquidity facility, may have impacted not only muni yields, but also the ability of state and local governments to issue new primary debt and recall other sector employees throughout the crisis.

So, to start off, I wanted to outline some of the exact ways in which we think this crisis may have impacted budgetary finding, which we've sort of talked about a bit already. And how do you consider a local government's 2020 calendar year, spanning two fiscal cycles. So, in an annual expansion year, governments incur expenses throughout this period but only receive revenue distinct intervals. And a classic example of this is proceeds from final settlements of state and

local income tax returns due on April 15th. But when governments are short of revenue, they often issue short term anticipation notes, sorry, on municipal bond markets to help smooth out the temporary shortfall.

So, in this example, they might issue a four-month tax anticipation note or ten, issued on January 1st, maturing maybe April 30th. Generally, a bond person needs to smooth out the cash flow and would be secured by revenue incoming on April 15th. Now, as we discussed, an income shock like COVID, first and foremost, leads to declines in income receipts, both today and tomorrow, so that's going to lead to a decline in the revenue that would normally cover expenses already incurred. But second, as a matter of fiscal policy, the IRS extended the Federal tax deadline to July 15th, which meant that the quantity of short term notes issued on the market also had to increase to match cash flow needs.

And this might normally not be such a huge problem, except simultaneously there was a large financial sell-off of many fixed income assets (inaudible) being just one of them, as investors sought

out more liquid and safer positions. And that drove investor demand (inaudible) Euro, leaving governments largely unable to issue new debt on private markets.

So, to further highlight these dynamics, the left panel here shows weekly means for a universe of secondary market municipal bond yields and shows a steep rise leading up to the first Federal sector intervention in the muni market on March 23, especially among shorter maturity notes. And then after two similar MLF interventions, we have a return to sort of relative normalcy after the third intervention, which is the one we focused on in this paper. So, we see this both in short term and long term markets.

And then, finally, if you turn to the right, what you see is that this return to market functioning was most pronounced for safer issuers with potentially fewer bonds on the margin of downgrading or defaulting whereas high risk bonds like Triple Ds remain distressed. So, it is sort of an important finalized (phonetic) fact that I want you to hold onto, that I think it's a pattern that our paper can sort of help explain.

And so, finally, these two plots are probably what we care most about from a real economy perspective. So, on the left, we see a clear shortfall in newly issued bonds towards Euro, relative to historical trend which is the gray shaded area. But their reversion, even over compensation, post announcements. So, then on the right sort of we plot taking local government employment over a longer time series which allows us to compare the Great Recession experience to the pandemic, and you see just a much sharper drop with little to no recovery, and that's something that's emphasized in Louie Shiner's work and a topic we explore in our paper as well.

So, what do we do in this paper? We have two related research questions. So, our first is more of a program evaluation question, in which we ask whether Federal sector interventions were effective at restoring market liquidity and the extent to which these actions sort of pass through to new issuance in public employment outcomes. And our second is sort of related to the previous paper and more academic in nature is (inaudible) toward sort of getting under the hood of

mechanisms (phonetic), which is can we learn whether municipalities are liquidity versus credit constrained by randomly providing an emergency liquidity option to differently rated issuers when they are distressed.

So, our idea here is that a mutual but non-zero response to the option would suggest a relaxing of the liquidity constraint relative to what's available in the current market, where the greater response more down rated distribution would suggest sort of an additional mechanism in which credit risk may become more uncertain for low-rated issuers when faced with a common shock. And so, the additional liquidity sometimes hedges against that risk.

So, to answer these, we're going to take advantage of lending eligibility cutoffs built into the MLF, which was designed to target local short term cash flow needs that last resort lending, but restricts direct lending eligibility to cities above 250,000 in population and counties bigger 500,000 in population, providing us control groups of observational equivalent issuers who narrowly missed the direct lending cutoff.

So this, combined with the timing of the

announcement is going to allow us to isolate the effects of one particular intervention against a backdrop of sort of many active policies during this period, using a regression discontinuity design. And so we'd be looking at both investor perceived value by separately analyzing yields across the rating distribution, as well as the government perceived value with budget officers and CFOs charged with hiring decisions. And we called it the option value of emergency liquidity, because take-up is not mandatory, of course, and, in practice, it was quite low. So, that's a puzzle that we return to at the end.

So, we talked about a lot of this already, but we just wanted to mention the sort of key interventions that are indicated by three dash lines throughout the talk. So, everything prior to March 23 is kind of the pre-period. And then after April 27 is the post period. So, the first was after a record sell-off of muni mutual funds, but that expanded the MMLF to accept variable rate demand notes as pledgeable collateral to make loans to banking institutions and that was what initially drove demand for munis back up from the brink. Then on April 9, the MLF was announced as a special purpose

vehicle with a $35 million dollar Treasury backstop for a maximum of 500 billion in short term muni note lending. And eligible issuers here included states, initially only cities greater than one million and counties greater than two million and only bonds with less than two-year maturities which were all priced at sort of a penalty rate and that pricing was non-linear by issuer rating.

So, not listed here, the MLF was also announced as part of a larger 2.3 trillion dollar intervention, including the PTP in several corporate facility expansions. So, focusing on the timing alone, as Blake mentioned, is a bit challenging and, so often we're sort of left with a evaluating the totality of effects.

And so, finally, crucially for our empirical strategy on April 27, eligibility was greatly expanded to 250,000 for cities and 500,000 for counties and admitted up to three-year maturity notes to give states some maneuvering room as bonds by pledging requirements also preclude deficit borrowing across fiscal cycles. And this permitted sort of a window for potential

Constitutional amendments.

Okay, so why were these particular population cutoffs chosen? Well, we have this nice quote in the paper by Kent Hiteshew, which emphasizes that the largest issuers were initially targeted with an eye towards speed and execution. And so, what we've one here is shown the initial population cutoffs, the right dash lines, followed by the expanded cutoffs with the left dash lines. And the first thing to notice is that, while there are only a few issuers above the initial cutoffs shown in the top two panels, the bonds traded with far greater frequency above the initial cutoffs shown -- I'm sorry, the bonds traded with greater frequency indicated by those tall blue bars. And so this sort of belies the logic that one way to move the aggregate market is just to start with the top.

So, the second thing worth noting is that our design would not have been possible had the original cutoffs been retained. So, the expansion sort of allows us to take advantage of richer data very close to the cutoff. And in this paper, we sort of show that the baseline characteristics around that second cutoff are

bound to the very narrow windows close to the cutoff.

And lastly, the eligibility populations news were sort of lagged by a year or two, so all of this sort of suggests that MLF optionality was as if randomly assigned very close to the cutoff.

So, we've put together sort of many data sources. We start with a list of issuers that ever had active debt on Bloomberg. We then take all MSRB trades from January 2019 to the end of 2020 and merge an issuer name to Census Bureau localities to get both their populations to determine eligibility and their associated QCEW public sector employment numbers. We then also pulled on monthly bonds ratings from S&P, Fitch, and Moody's, and not all these, sort of the aggregated, bucketed bins (phonetic), A, AA, et cetera, calculating for each issuer a plurality issuer rating across bonds and rating agencies by much (phonetic).

And finally from merging, we have a number of bond characteristics as well as any primary issuance that was never traded on the market. So, after sample restrictions, this results in about 2.8 million trades and 94,000 trades from roughly 750 issuers in our

smallest subsample, which is low rated A and BBB city and county issuers post MLF.

So, similar to the prior talk, we're going to show some plots of the raw data within an arbitrary 100,000 population bandwidth around the cutoff which really highlights the underlying variation in the design and tells sort of most of the story. So these are just raw weekly (inaudible) say from whether your January 2020 pre-COVID credit rating was high or low, MLF eligible cities and counties that are sort of within 100,000 above the cutoff are indicated in blue while ineligible issuers less than 100,000 are in red. So, think red distress.

And so, what first shines through among highlighted issuers is that, on aggregate, the spiking yields, obviously it seems they've begun to decline right after the first announcement. But not really differentiate based on their MFL access. But among low rated issuers on the right, a strong wedge begins to develop exactly when the revised cutoffs are announced, while the placebo period prior to market turmoil, remains sort of relatively balanced. So, in fact

ineligible A and BBB yields mimic that elevated distress pattern in the larger BBB market which we saw earlier, while those with MLF access look a bit more like safer bonds exhibiting a fuller recovery with the MLF option.

So, briefly, I'm just going to glaze over this part. This is sort of the formal explanation of the graphs we just saw, the regression discontinuity where bond yields remand the outcome, we're going to be tracking sort of trade and a bond b issued by issuer i and period t. One benefit to this formulation is that this alpha variable can be interpreted as the control group mean, so it represents sort of the mean control with yields for employment very close to the cutoff.

And then for our heterogeneity results, our preferred specification has state and months fixed effect to absorb noise from balance budget requirement stringency. And when the sample is constrained to 2020, these also absorb sort of state specific tax exemption rules.

Okay, so here is our preferred specification where each row reflects a separate regression. So the 72 basis point effect is the formal estimate associated

with the trends we showed you earlier, and if you compare the size of this effect at the baseline mean, either 265 or 305, depending on what you benchmark to, you get about a 23 or 27 percent effect size as a share of baseline yield which is sort of a really sizable effect, but only for low rated issuers. And then we assuringly (phonetic) in the placebo, we don't find any such effects prior to the policies that were in place, and then not shown here issuer bond characteristics are sort of completely balanced in these samples.

And so this is just to show you that we get the (inaudible) version of the table where the 72 basis point effect is just the jump in the intercept on the right. But for the sake of time, I'll just move on here and just mention that these plots and these estimates are completely robust, just sort of any bond characteristics you throw at it, geo, revenue bonds, different tax adjustment methods, inclusion of refi's, right.

So, I'm going to show now some simple plots of cumulative new primary issuances since January 2020 by ratings. Focus on the plot on the right which shows

earlier debt issuance among the MLF eligible issuers. So while there are only five of these sort of very low rated issuers in this very tight window close to the cutoff, we associated RD estimate is statistically significant and the sign is consistent with the secondary market yield effects. So, we think there's sort of a channel here between secondary market functioning which feeds back into primary issuance.

So, finally, we turn to asking whether budget officers and CFO's responded to the MLF by re-hiring public sector employees. And for this, we use QCEW data, which provides monthly, local government employment counts, but combine as the county level, so we can't separate city from county employees. So, this poses a bit of a problem because some cities to the left of the county cutoff may be treated while some counties to the lefty of city cutoffs may be treated. And further complicating things, there are some that are double-treated. So that there's really these three representative groups, and what we're going to do is just compare the A types and the C types on the right of the cutoff with those counties that never were treated

either by a city or a county.

And so, this might show the cost concerns with breaking the randomization in the RD, so our main results sort of look at the year on year differences in employment or for percent changes in employment to sort of kind of control for these unforeseen concerns. So this is sort of the main table of out employment effects where each estimate is again from a separate regression.

And the first thing to note is that the control group means below suggest we're analyzing fairly large counties with roughly 18,000 local city and county employees which experienced a 1,700 employee (inaudible) loss. These point estimates of 200 to 300 suggest that emergency liquidity induce greater recalls. But this is only statistically significant when focusing on service providing jobs, the lion's share of which sort of are coming from educational institutions. So, on a drop of roughly 1,700 employees, eligible localities gained back 422 to 517 workers which is an immense 25 percent roughly of the initial decline. That's only among service providing jobs.

So, interestingly, we can then chart out year

on year employment effects in any given month and get this plot which reveals sort of a striking school year pattern. So April, May, and June workers were recalled despite persistent lockdowns during this time, again driven largely by educational institutions. So, combined with sort of additional result which show that this pattern is most sustained, in the long run for highly rated government, you begin to hone in on a story in which governments were extremely sensitive to emergency liquidity, suggesting that they may have, in fact, been sort of overly cautious in their initial furloughing.

However, this plot brings up sort of another concern which is that detecting differential RD effects in April prior to the MLF cutoff expansion, even though there were no such effect on yields. And so, the main confounder here is that the CARES aid CRF formula actually shares with one cutoff with the MFL, allowing cities and states to act as more direct aid if they exceed 500,000 in population. And so, we do some extra tests taking advantage of the different amount of aid and lending and find suggestive evidence that most of

these employment effects are, in fact, being driven by CARES aid. So that is grant funding is impacting hiring while the lending backstop is really affecting yields.

So, the last result I want to leave you with is a mechanism test. We show that investors responded to MLF access but only if lower rated, and this begs the question, would the availability of the MLF perceived by investors as sharing in credit risk. So, on the left we show that, in fact, issuers that narrowly missed the cutoff were also more likely to have their credit downgraded over time.

Now, on the right, we have some work in progress in which we decompose yields into sort of a default risk and liquidity component and show that rising credit risk played a significant role in the run-up to the peak crisis period for all issuers, but especially for lower rates sort of cities and counties.

Okay, so to wrap up, we find that the MLF improved overall market functioning and that MLF eligible credit-risk sharing seems to play an important role, explaining at least part of the long term distress pattern in the BBB market. We provide evidence that MLF

issuers were disproportionately likely to issue new debt and recall state and local employees, but suggested that evidence showed that this rehiring was most likely due to CARES aid rather than the MLF. And all the results generally imply that the muni market will -- economy outcomes would have been worse absent intervention.

One final puzzle tjhat needs be probed in future work is whether the low MLF take-up rate relates to a facilities pricing. So if you just quickly look at this last plot, this is the --

MR. BERGSTRESSER: I just want to -- we're already about four minutes over. I want to make sure that we --

DR. HYMAN: I'll stop here then. Thank you so much, and I'll leave you with that and looking forward to the discussion and questions.

MR. BERGSTRESSER: Excellent. Excellent. Hopefully, there'll be in the Q&A a question about that. But I want to turn it over now to Melissa Moye from the United States Department of the Treasury to discuss this paper. So, Melissa, please go ahead.

MS. MOYE: Sure. And I want to try to share

my screen as well. What I'm attempting to share is actually on the website and it's simply a summary that distills the primary results of the paper. And actually the comments are those of the authors, not my own.

MR. BERGSTRESSER: We don't see it yet. I don't think it's been shared yet.

MS. MOYE: Let's try that.

MR. BERGSTRESSER: That's excellent. That works.

MS. MOYE: Great. Thanks, Dan. So, I plan to pose just a few questions and a few areas to consider expanding the research. And I hope to leave a few extra minutes for Ben as well, because a huge amount has gone into this work, and there is more to share from him. I would very much like to thank Ben and Andy and Or for taking on this research. Finally, I don't speak for Treasury and the views that are expressed here are my own.

So, the paper clearly delineates the primary aims of the MLF, which is to help state and local governments manage cash flow pressures which are brought on by COVID and also to restore the muni bond market to

normal functioning. It was not designed to form longer term budget gaps and, of course, since then those issues have been targeted by significant fiscal programs.

Ben stated a critical element of muni market destruction in March of 2020, and a real motivator, of the MMLF collateral expansion to the RDM's, led to the RDM rate spike during March 2020 and I have to just defend (phonetic) if I may add some more just contextual information on trend at that time.

In terms of the MMLF and the MLF, the previous authors actually discussed it a good amount. The difficulty of parsing out the effects cumulatively, but I do think some additional consideration of what kind of methodology could be used to parse out those effects over time. That deserves additional thought. Because there really are questions that remain. To what extent did the MLF rely on the presence of the expanded MMLF? Was there a combined or a later effect? How effective would the MLF have been without the MMLF? And how important was the timing of the MMLF expansion which preceded the MLF announcement by over two weeks?

So, as stated in the testimony in Congress,

the MLF eligibility size cutoff was, in fact, driven by concern about delivering the facility quickly and efficiently for issuers and for the market

I think, in general, it would be helpful if the research could shed more light on the responsiveness of the primary and the secondary markets to these various constraints on eligibility, different size cutoffs, different eligibility -- or eligibility of different types of government issuers. I mean, a question, is it reasonable to expect the program with a similar population size cutoff would be effective in the future.

So, the paper correctly raises the question of how the MLF impact was transmitted from short term to long term yields and the short term to long term bonds. But the primary mechanism that's positive is that short term borrowing is used to pay long term debt service. And it would be great to know more about how they might test this hypothesis, test investor response to issuers subject to strict use of fund and low spending fungibility (phonetic) versus issuers with more permissive regime, for example.

With the MLF, the Fed shows primary market support as its main venue for a policy lever in the municipal market. What does your research say about when this focus on the primary market would be effective? In other words, other situations without also purchasing on the secondary market.

And, finally, to what extent was the 500 billion dollar capacity of the facility was huge. A substantial factor inspiring confidence and improving investor demand for municipal bonds. For instance, would a 200 billion dollar facility have been enough?

So, as you can see, my comments really focus on remaining policy questions, most of which really can't be addressed by the regression discontinuity approach based on MFL's issuer size cutoff. So, it's really sort of thinking beyond, in some sense, the paper. I really want to thank the research team for supplying rigorous formal methods to the available market data and congratulate you on a very useful paper. Thank you.

MR. BERGSTRESSER: Thanks very much. Ben, you want to take -- (audio skip) There's some echo there.

Can you guys hear me okay? Ben, do you want to take a moment, and, Melissa --

MR. HYMAN: Yeah.

MR. BERGSTRESSER: Great. You want to respond? MR. HYMAN: Yeah. Thanks so much, Melissa, for the great comments, and all just for going over, there was a lot of pack in here. So, yeah, I mean, I think the main question on the head, which also Blake and Huixin were trying to address, which is sort of the totality question. So we've got this great strategy for looking at sort of local mechanisms with this regression discontinuity. But that doesn't tell you anything about the aggregate effects or the sort of counterfactual of what would have happened absent either one of the interventions or were there another either -- would it a be a different cutoff in population or a size of, let's call it, the backstop bazooka, whether that would have been larger or smaller or would have been more appropriate.

Again, these are all, I should say again, our own views and not the views of this system, but there was some discussion early on about the sizing of the

backstop. And I think the predominant message was to send a signal that there would be a huge package that would address many elements of the market. And because these assets are all interrelated, I think that was sort of the strategy, even though the expected take-up, especially in the short term market, you know, would never have kind of hit that 500 billion dollar cap.

So, I think that the -- we're doing some extra work now to sort of try to decompose these aggregate effects similar to what Blake and Huixin had done, but focusing more -- not on pre-refunded bonds but I think that's definitely sort of the next area of research for us.

I did have one thing that I didn't get to say -- well, I sort of brushed it through, but I can (inaudible) in terms of lessons learned, one area is sort of regarding the pricing of the facility, especially the penalty pricing. So where the pricings sort of have been a little steeper for lower rated issuers or even if the whole level of the penalty was kind of down a level, would that have induced higher take-up of the program and not disproportionate take-up

at the low end of the market. I think that's sort of a pending question that we also hope to address in future work.

MR. BERGSTRESSER: I want to acknowledge now the presence of two co-authors of this work. So, in addition to Ben Hyman, we have Or Shachar, and Andy Haughwout -- Andy, did I get that name right?

MR. HAUGHWOUT: Close enough.

MR. BERGSTRESSER: So, Andy how -- do either of you want to jump in now and share your thoughts as a co-author of this paper?

MR. HAUGHWOUT: Maybe I'll just also thank Melissa for comments. I'm looking forward to any other questions that come from the floor. I think you did, Melissa, put your finger on some of the key policy questions. I mean, of course the major purpose of writing the paper was to inform future policymakers about the particular elements of the MLF and its interaction with other policy interventions and how they can learn from that for future interventions when needed. So, I think Melissa exactly the right discussion for this paper because she's got exactly that

perspective and so, we appreciate her thoughts.

MR. BERGSTRESSER: And Or, do you --

MS. SHACHAR: Yeah, so, again, Melissa, thank you very much. So just to define about the different job facts of the credit (phonetic). So, as Ben mention, we are working on the different position. And there we actually, unlike the Marsh paper where they are looking at the pre-funding with a sample that might be smaller, we ae looking at a broader sample where we are measuring liquidity directly and then the residual we treated as default from (inaudible) for all the bond characteristics. So, there we also find consistent result with the regression discontinuity, of course, so that kind of (inaudible).

MR. BERGSTRESSER: So, I actually have a question as the moderator. I don't know if this is allowed, but I've got a question and I hope this isn't too naïve of a question. But, what are the legal and practical barriers, or what would have been the legal and practical barriers to using the states as conduits. Instead of saying, we're going to loan directly to the cities and counties, just creating the expectation that

we will create the facility for states, and then the states will, in the spirit of Federalism do their thing with the municipalities and localities?

MR. HYMAN: Yeah, so, we didn't really get into this but state downstreaming was permitted in this program. So, there was a sort of large cap offered to states. But the degree to which states can pass through, I think is what we were focusing on, is limited by the state legislative approval. Beyond sort of that, I don't know if Andy has a further color to add to that. But that's sort of -- I think the view is that this would sort of require a piecemeal correlation across many agents.

MR. HAUGHWOUT: Yeah, and I'll just add, I mean, one of the lessons learned here may be that these decisions ultimately become quite political. There was quite a lot of discussion early on when the Fed actually discussed downstreaming and explicitly in the term sheet. And I think that response that we received from the public to some degree was well, in some states that might be much more feasible for certain governments than other governments, and there's all kinds of political,

in addition to legal and Constitutional constraints on the willingness or the ability of state government to downstream. So, I think that was part of the motivation for the Feds and the Treasury's decision to expand the eligibility facility. I should mention these are my views and not those of the Federal Reserve System,in case I had forgotten to mention that.

MR. BERGSTRESSER: Or, do you want to --

MS. SHACHAR: Yeah, I will just add one more thing to that. In normal times, also, there is a (inaudible) as observed by (inaudible) in your paper, so that's just an extreme case of that kind of different (inaudible)

MR. BERGSTRESSER: To what extent does your identification strategy depend on the expansion having been a surprise to the market?

MR. HYMAN: So, I think the timing does matter. We saw that the sort of yields budged exactly on the week of the day the announcement was made. I think we've done a lot good work to show that the cutoffs chosen and using a cross-section were sort of terrifically chosen, i.e. orthogonal to the underlying

characteristics. But certainly the timing, what I think the timing does for us, it's not so much that was unexpected. It may have been expected and sort of in a broader expansion of some kind might have been expected. But the specifics of the population cutoffs is what might have come as a surprise, or at least as something that the market had to react to. And that's what we were able to observe.

MR. BERGSTRESSER: You have any -- we have a minute left. Do you have any last words that you want to share with the audience? Any of the authors or Melissa, the discussants?

MR. HYMAN: Yeah, I just wanted to thank all of you again for organizing and thank Melissa, who was very kind and flexible with us as we sort of sent some last-minute revisions as well. So thank you all for the great comments, and we look forward to incorporating them in the next draft.

MR. BERGSTRESSER: Great. Thanks to all of you and thanks to the audience who was involved in this as well. We are now going to take a 10-minute break, so we're going to break for 10-minutes. The session will

stay open and live. I'm going to turn off my microphone and camera and then when we reconvene, we'll have a paper at 12:55. This is the paper by the team of researchers at the Federal Reserve Board this time and Cornell that Alex Zhou is going to present. So we'll reconvene in about 10 minutes.

(Recess)

MR. BERGSTRESSER: All right. We are back. It's 12:55 and we are back for the second set of two papers at the first day of the Municipal Finance Conference. Before we dive into the papers I want to just make a couple of announcements.

The first is that if you're interested in participating in the Q&A part of this you can go to the SLI.DO website, that's SLI.DO and use the code MuniFinance, so that's all one word, and submit your questions or comments in that way.

The second thing that I want to highlight is an opportunity that will occur Wednesday. So on Wednesday we're having two open invitation concurrent breakout sessions. This is Wednesday at 1:30 p.m. East Coast Time. So it will be 10:30 p.m. on the West Coast.

I'll be moderating a session where we're invited to discuss recent developments in the municipal bond structure, advanced refunding, you know, taxable versus taxes on bonds, all those parts of the market.

Louise Sheiner of the Brookings Institution will be moderating an informal group discussion talking about dynamics in state and local finances. Details on these open invitation sessions are available in an email that went out from David Wessel this morning.

So without any further ado I'm going to turn it over now to Alex Zhou from the Federal Reserve Board, who has 15 minutes to discuss this paper co-authored with Maureen O'Hara and Yi Li. And then the discussant is going to be Mahyar Kargar from the University of Illinois.

Thanks for being here again, and take it away, Alex.

MR. ZHOU: Thank you, Dan. I want to thank the conference organizers for including our paper to the program.

As Dan just introduced, the paper is joined with Yi Li, my colleague at the Federal Reserve Board,

and Maureen O'Hara at Cornell. Since I work at the Board the usual disclaimer applies both to the paper and my discussion today on this are necessarily those of the Feds.

So let me start with a very quick introduction to the study. We know that fixed income mutual funds do a lot of liquidity transformation. They offer liquidity to the investors and allow them to redeem their shares on a daily basis. But at the same time, you know, most of fixed income assets that they hold are very illiquidity and it can take weeks or even longer to liquidate.

A number of studies have shown that, you know, when bonds face an inactive shocks to the assets that they hold, this liquidity transformation could generate a first mover advantage among the investors and lead to amplified redemption. And, you know, so more recent papers have also shown that these amplified redemptions could affect the underlying asset market, for example in fund outflows have been shown to be fire sales and affect price and volatility in the corporate bond market.

Now what we don't know much about is sort of that the role played by dealers in transmitting the fragility risks forced by mutual funds. We know that the dealers are very important in the function of most fixed income markets. And, you know, this increased demand for liquidity on these mutual funds could potentially affect the markets stability if the dealers are not there to provide liquidity.

So what we're going to do is that we're going to use the COVID-19 crises to analyze the fragility risks that mutual bonds introduced to the muni market. And as I'll show very shortly, you know, the key feature of our analysis is that we have incorporated the role of muni dealers in transmitting the mutual fund fragility risks. And we will ask the following questions.

The first question we're going to look at is how does trading in munis relate to mutual fund ownership at the height of the crisis. And secondly, how will dealers behave when they face large selling pressures. And perhaps more importantly, you know, how will their behavior change for these bonds with larger potential mutual fund fire sales post- crisis. And in

the end we explored the potential impact of mutual fund fragility risks on liquidity and pricing of munis.

So, you know, there are a number of reasons for us to use the muni market to study mutual funds fragility risks on the market, although it is still dominated by weekly investors, mutual funds have grown to be the largest institutional investors. And they together hold about 20 percent of munis. The market is a large market that is highly illiquid and it is highly segregated because of the state tax benefits and, you know, the market heavily relies on dealers for its intermediation.

Unlike the corporate bond market, you know, in the muni market they have, you know, few means to hedge price movement partly because CDS markets for most of the municipalities do not exist.

And lastly, holding concentrations of munis by mutual funds are higher than that of corporate bonds.

So the question for our analysis is that how do we disentangle the effects of mutual fund fragility risks from, you know, the general pandemic effects.

As I will show you, you know, only about 30

percent of municipal bonds are held at all by mutual funds, with the rest predominately held by mutual investors. And this sort of give us a nice control group that captures the general pandemic effects and, you know, you will see that although the behavior of the bonds held by mutual funds, although they are very similar to those not held by mutual funds before the crisis, they sort of diverge both during and post the crisis.

Now more importantly when the control for this time-varying effects of various bond characteristic and in our strictest specification, we are going to include an issuer date-fixed effect. And, you know, this issuer date-fixed effect essential allows us to sort of compare similar bonds on the same issuer and traded on the same day but different incomes of their mutual fund ownership.

So as the background I'm going to go very quick on this, you know, the two previous papers have sort of talked about this timeline of this municipal bond liquidity crisis during the COVID-19 pandemic. Between early to mid-March the muni market came under

stress with the use price shooting from 1 percent to about 6 percent. And mutual funds saw large outflows between these two weeks from March the 9th to March the 23rd they lost about 16 percent of their assets.

And we know that the strain of the market conditions led the Federal Reserve to intervene with a series of facilities, including the municipal liquidity facility, the primary dealer credit facility, money market, you know, mutual market money fund liquidity facility and the CP funding facility. And shortly after these intervention the muni market conditions starts to improve. Mutual funds also stopped and use spread dropped substantially.

So I'm going to show you three slides that sort of provide a preview of our main results and sort of tell the whole story. So the first slide shows that the mutual fund redemption destabilized the muni market during the COVID-19 crisis. The figure plots the trading volume of muni bonds separately for bonds held by mutual funds, in red, and the bonds that are not held by mutual funds.

And as you can see, you know, during the

crisis time, which is sort of defined between these two drop lines, trading volumes increased six times, almost entirely driven by the trading of bonds held by mutual funds.

Now this slide shows that muni dealers play a key role in transmitting the fire sale risk of mutual funds. So the figure plus the total cumulative dealer inventory of munis, again separately for bonds held by mutual funds in red, and those not held by mutual funds in black.

And as you can see, these are sort of performing their normal market activities during the two weeks leading to the crisis, but they stopped taking and they actually started selling bonds held by mutual funds at the height of the crisis.

Now what is interesting here, you see that the pattern, although they are sort of very similar, before the crisis they start to diverge after the crisis. You know, the dealers continue to cut down their inventories in the bonds held by mutual funds.

And the last slide shows that mutual fund fragility risks introduce what we sort of call a fire

sale premium, incorporated the muni pricing in the post-crisis period. So this figure plots the tax-adjusted yield spreads of munis, you know, separately for bonds held by mutual funds and other bonds. And as you can see here, you know, before the crisis started, you know, they short of could move together. But after the crisis about 30-basis point wedge sort of persisted between the yield spreads of bonds held by mutual funds and, you know, and those that are not.

Now obviously, you know, these figures are subject to an alternative explanations. So in the rest of my talk I will show a number of results for more regression analysis where we hope to control for other potential compounding effects. And hopefully this will result and help us, you know, in gaining a better understanding of the potential fragility risks posed by mutual funds and the amplification of such fragility risks by the dealers.

So I'm going to go very quickly on the data we use. The sample used in the paper starts from the end of 2019 to July 17, 2020. For municipal bonds we collect the transaction-level data on secondary market

trading, or MSRB. And the bond characteristic information is obtained from Mergent Municipal Bond Securities Database. For municipal mutual funds we collect the security-level holding information, the quarterly, you know, security-level for the information from some wider eMAXX database. And we're able to do that for about 900 bonds.

Also for a subsample analysis we also collect the AUMs and the daily investor flow for about 400 funds and we merge these two data together using the bond mix.

So the first of the regression analysis being conducted is focused on the crisis period. And the question we want to ask is, you know, whether mutual fund ownership, rather than other factors, that drives the surge in muni trading during the crisis?

The sample covers about four weeks, from February 24th to March 20. So the first two weeks we recorded a pre-crisis period, and then from March the 9th to March 20 we recorded a crisis period. Now the sample is constructed at the bond and date level, which is sort of represented by INT. So it's sort of a standard difference v difference regression. We regress

the trading activity in Bond i on a t, on a dummy that is equal to 1 if the bond is held by mutual funds, a crisis dummy for the last two weeks of the sample period, and more importantly, the actual crisis dummy is held by mutual fund docs.

So essentially we wanted to see whether trading activities experienced any differential increase in the bonds held by mutual funds during this two weeks of the crisis period. We include a host of bond characteristics such as, you know, rating, coupon rate, age, time to maturity, and amount outstanding, as sort of the basic bond characteristics. And in addition we also include a fixed effect, or bond type, for example whether this is GEO bonds or a revenue bonds which equals, you know, a dummy for offset, a dummy variable for bond sectors, and then we also include a dummy for the state of the municipality.

The result in this column basically, the first column of this table shows the result on estimating our regression. And as you can see, compared to other bonds, those held by mutual funds experienced an additional 29 percent increase in trading activities

during the crisis period.

We also estimate a sort of continuous version of the mutual fund ownership so instead of the dummy to tell us whether the bond is held by mutual funds or not, we used an MF share variable, which is the percentage of a muni outstanding amount that is held by mutual funds and, as you can see, the results continue to hold.

And then we progressively, you know, include more fix-it tax. For example we control for issue of fix-it tax and then also the date fix effect. The results continue to hold in the strictest specification as I mentioned earlier, you know, we control the bond characteristics, the interaction of the bond characteristics and the crisis dummy. And more importantly, we now also have the issuer date fixed effects.

So the results basically suggest that, you know, when you compare similar bonds by the same issue on the same day, those with more mutual fund ownership experience larger increase in trading activities during the crisis.

So the question obviously is that how does

this response to --. So the question we want to ask here is that how, you know, how the dealers respond to mutual funds sale ops. And again what we do is that we use the same four week sample period and then we reestimate the empirical model but now by replacing a total trading activity in a particular bond with this dealer net purchase. So the dealer net purchase is the dealer's aggregate purchase minus their aggregate sales in bond i on day t. And then the rest are, you know, held by mutual funds dummy, crisis dummy, and interaction of the two with the same model specification.

The result is presented in this table. As you can see from the first column, dealers sell more bonds with mutual fund holders during the crisis with the coefficient of the interaction become connective and highly significant. And again, using a continuous version to capture the mutual fund ownership and, you know, progressively reporting out of 6 percent but not change our results.

So one particular thing we wanted to sort of highlight here is that the, you know, the

materialization of the mutual funds for fragility risks during the crisis seems to have some long-term impact on the muni market. As you can see here, you know, shortly after the Fed interventions, redemptions from muni funds sort of stopped. And funds largely normalized in April. And as you can see here, in May muni funds started to attract consecutive inflows.

So to sort of better understand that this post-crisis dealer liquidity provisions we are going to add another sort of difference v difference progression. So the empirical question is that whether dealers reduce their inventories in bonds bearing potential mutual fund fragility risks. So we are going to regress dealers cumulative inventories in bond i on day t on a dummy for the post-crisis period, a dummy held by mutual funds and the interaction of the two. And again, the rest of the specification is very similar to the previous models that we estimate.

Now the difference here, one key difference here is that we're going to use a much longer sample period. So instead of just the focusing on the two weeks before and after the start of the crisis, now we

are going to look at the whole sample period. So the sample will start on January the 3rd and to January the 17th, but we're going to exclude March and April. So what's the difference between the paper and, you know, the other papers that you saw earlier is that we're not evaluating the impact of the specifics of the muni market, we are sort of more focused on the aftermath of this really marketed liquidity crisis.

So the pre-crisis is January and February, with May, June, and part of July as the post-crisis period. And as you can see here, dealers reduced their inventories more in bonds bearing higher mutual fund fragility risks.

And the change in dealer's behavior seems to be sort of reflected in the market liquidity conditions. We use, you know, the spread of the bond as the dependent variable and find that post-crisis liquidity seems to deteriorate more in bonds held by mutual funds. And, you know, this liquidity deterioration seems to be more severe among those most frequently traded bonds.

MR. BERGSTRESSER: Alex, as moderator, just to signal to be aware of the time. We're three minutes

over.

MR. ZHOU: Okay. Thank you. One more minute I'll finish.

So we also look at the tax adjusted bond use spreads to understand the pricing of, you know, the mutual funds fragility risks. So again, we regress the bond use spreads on this sort of using the difference v difference regression. And the model basically shows that in the post-crisis period all muni bonds have high yield spreads efficient for the post-crisis to be positive, but the yield spread for bonds held by mutual funds increased by an additional 34 basis points, and the results sort of to different measures and specifications.

And the last question to show is, you know, we explore this that if the pricing tax are indeed driven by the fear for potential mutual fund runs then we should expect such crisis effects to be stronger for bonds held by mutual funds who are more susceptible to rise. So indeed what we did is that we cut the sample of the bonds into two subsamples based on their mutual fund holders for the liquidity measures, depending on

the their sort of, you know, exposure to the COVID pandemic, the average maturity of their portfolio or the liquidity of the portfolio, and we do find that the pricing effect seems to be substantially stronger in the subsample of the bonds where, you know, post mutual fund owners seems to be subject more bond risks.

So let me just conclude. You know, investors redemption from mutual funds seems to destabilize the muni market during the COVID-19 crisis, we showed that the dealers play a key role in transmitting the buy/sell risk of mutual funds, and so the fragility risks posed by mutual funds seems to have lasting effects on the muni market and the price effect of stronger when about 40 bonds are more susceptible to potential investor runs.

Thank you. Sorry for taking more time.

MR. BERGSTRESSER: Great. I want to turn it over now to Mahyar Kargar from the University of Illinois. So take it away.

MR. KARGAR: Thanks again, Alex, on sharing so much. Perfect. All right. Thank you so much for asking me to discuss this interesting paper. I really

enjoyed reading the paper. So I'm trying to quickly summarize what Alex just showed us.

So basically the idea is that mutual fund redemption destabilized the muni market in March, 2020. And given the fact that there is this inherent mutual fund liquidity fund mismatch or bond funds mainly, at least runs already established in the empirical theoretical literature. And basically what Alex showed us very convincingly that munis held by mutual funds basically have their own 30 percent higher trading volume relative to the bonds that are not held by mutual funds. And among the ones that were helped by mutual funds we see higher yield spreads for bonds with higher outflows and also higher volume for munis held by the funds with larger outflows. The end results are bases are very robust, they do a very careful empirical analysis, definitely no issues there.

And then importantly, the dealers, as Alex mentioned, have the pretty important role in transmitting this shock from mutual fund redemptions. So accordingly before, like two weeks before we see these outflows on March 9th we see that dealers actually

started accumulating more munis held by mutual funds than other bonds, and authors speculate that this would be probably due to the fact that bonds want to accumulate cash reserves in anticipation of outflows.

During the crisis you see this actually reversing. You see that these ended up being net sellers of the munis held by mutual funds and then sell around $20,000 more per bond day for munis held by mutual funds. And importantly what's really kind of interesting and kind of puzzling to me that after the market kind of stabilized in May to July we see dealers actually continued to shed inventories of these bonds that are held by mutual funds and sold on average around $267,000 more of these bonds that are held by mutual funds.

So and then importantly this fragility risk proscribes the price. So we see around 34 or 33 basis point yield premium for munis that are held by mutual funds post-crisis, and the premium in comparison was only 6 basis points pre-crisis. And the interesting thing is that there is no difference in yields during the crisis.

And this is actually unlike what happened in the corporate bond market that I'm going to basically talk a lot about during my discussion. So the mechanism they discuss is that they are very careful, they look at measures that are suggested in the different paper and they relate it to potential bond risk and also they show that it's not going to be selection, it's not bond tied, it's not reaching for yield by muni mutual fund. So they make it very convincing that it's the wrong risk.

So I want to quickly show you the facts for the muni and corporate bond markets and kind of we see how these two markets contrast. Again, these two markets both are over the panel market, these markets have a very large in both of the markets. I want to show you like what the difference is in these two markets during this crisis.

So first let's look at yield spreads. All the plots on the left are going to be from the corporate bond market, and all the plots on the right would be from the muni market, mainly from Alex, the paper Alex just presented.

So you see that I mean yield spreads on

average, like both kind of went up dramatically during the crisis for both markets and then went down due to the interventions of the Feds and different interventions obviously in these two different markets.

Transaction costs, I mean the last one is from my paper with my co-authors, so kind of almost similar patterns. We see transaction costs went up during the crisis and then went down after the intervention. The right one is from the paper that Ben just presented.

However mutual fund flows, I mean we see very similar patterns again during the outflows elected from paper from Falato, Goldstein and Hortacsu forthcoming in the Journal of Monetary Economics. We see again large outflows during the height of the crisis, very similar pattern that we saw in what Alex just showed us.

But the very different plots are in the dealer inventory. These are dramatically different based on the corporate bond market and the muni market. So the last one again is from again my paper with my co-authors. For the corporate bond market we see dramatically different behavior post-crisis.

So during the crisis dealers actually shed a

lot of inventory during the height of the crisis, again dealers became net sellers, kind of a similar pattern that we saw around here in the muni market. But in contrast this with the post-crisis where dealers continue to sell whereas in the corporate bond market they are continuing to actually dramatically increase their inventories.

So again, as I mentioned, the dealers are very different, behave very differently in these two markets. Authors' explanation was this is because there was not a secondary market facility for munis on like corporate bond market. I mean Feds directly and indirectly intervened in both of these markets so the primary dealer credit facility was the indirect way of, one of the indirect ways of Fed interventions that allowed primary dealers to borrow against munis and corporate bonds, and then Fed directly intervened that through the corporate credit facilities in March 23th both in the primary and secondary market as in the left only the only intervention was in the primary market.

Actually, interestingly, one of the architects of the MLF had an interview with one of the Bloomberg

correspondence on April 2020 and then this question was brought up, why didn't you do a secondary market intervention. And the gentleman, Ken Hetscho, basically mentioned we considered that and the Fed would actually deployed the market facility if the MLF hadn't been sufficient. So they'd actually considered this but turned out not being required.

So I'm not going to go thorough MLF, it's been discussed in the previous paper in detail. Again, the immediate purpose of the MLF was to enhance liquidity to the primary short and municipal securities. So interestingly also, Alex and co-authors don't find any impact of time to maturity in the kind of impact on the muni market.

So I'm going to go talk about my comments. My first comment is we don't see any fire sale premium during the crisis. So this is like again plot from their paper. We see the fire sale premium only shows up post-crisis. You see these two graphs sort of diverge after the muni market comes to normality. So it's kind of like a little bit puzzling to me given the fact that so as I mentioned, the fire sale risk premium for muni

forced prices and the redemption largely reversed actually in April, 2020. So arguably, the run list should be higher during the crisis when everyone is selling. And why don't we see run list prices only post-crisis. It's puzzling to me, I don't have a good answer for this. And I don't know, maybe run list doesn't seem to be like the whole story so I don't know.

My second comment is about which dealer's actually reducing the premium. So this is a plot on the left-hand side that I looked at from the data through the New York Fed, this is a primary dealer as statistics data from New York Fed Weekly Data. I went and looked at the net positions of the primary dealers on the left-hand side, and on right-hand side in the same plot that I showed you earlier. We see that actually primary dealers ended up like categorizing their inventories post-crisis whereas as you see it's a very different picture from what Alex showed us from the MFRB.

So the question that I have is, this is again contrasting it again with regard to the corporate bond market, this is again from a paper with Maureen and Alex that I have in the JFE. It looks like for the corporate

bond market again primary dealers and non-primary dealers behaved very similarly. Both of them kind of post-crisis start increasing inventories. So this is a little bit again puzzling what's going on in the muni market that we do not see in the corporate bond market.

So my question is like okay, so we see that these muni inventories for primary dealers actually stabilized but this basically tells me that the non-primary dealers must have sold post-crisis, right? So the only way I can make sense of what Alex showed us is that non-primary must be the next sellers. This is again in contrast to that we observe in the corporate bond market.

So maybe I'm speculating here. Is there a difference between the dealer networks in the muni market versus the corporate bond market? There's like this famous paper by Leon Sharof (phonetic) in the Journal of Finance which basically shows you that the dealer network in the muni market has a core-periphery structure and the core is around 10 to 30 dealers, and the periphery has around 2,000 dealers. And the question that I have is are these primary dealers in the

peripheries, and not that importance so don't have basically an aggregate have that much of an impact on the inventory of the muni market? But again, interestingly, also the corporate bond market also has a corporate periphery per the nice paper in the Journal of Financial Economics by Demaudric, German and Fongshoes (phonetic) that actually show that market also has a corporate based structure. So again, I'm not sure what's going on here. Again, this is like a question I don't have a good answer for.

And finally, so there's this sort of pecking order of liquidity happen in the corporate bond market. There's again a paper by Amoul (phonetic) Zhou and Zing that show that actually consists of a dash for cash. Corporate bonds, actually mutual funds sold their most liquid assets first and then bonds with highly liquidation rank in the mutual funds had higher drops in price, higher risk premium. And higher liquidation rank means that a more liquid bond within a mutual fund family.

So the question that I have, do we see the same pecking order of liquidity for muni because you see

that that's we're catching basically pervasive in very different markets so I'm just curious to see if you see that in the muni market as well. So this is kind of the plot. From their paper we see that the bonds that are in first quartile of liquidity, the most liquid one has a higher credit risk during the crisis. So it's interesting to see that and again, I'm out of time, let me summarize.

Again, I've really enjoyed reading the papers, it's a very nice, careful empirical work. Again, they provide evidence that mutual fund redemption adversely impacts the municipal bond market and dealers play an important role in propagating this run risk. Again, as I mentioned, the dealers vary very differently in the corporate bond market relative to the muni market so I want to try to understand why, and then why the price of premium wasn't present during the crisis. Is there a difference within primary dealers and non-primary dealers and is there any pecking order in terms of liquidation opportunities.

And thank you so much for the opportunity to discuss.

MR. BERGSTRESSER: Great. Can you guys hear me okay? Give me a thumbs up if you all can hear. Excellent.

Alex, do you want to take a minute, we have about a minute to respond to that. We've got to start the next paper at 1:30 but I think you have a minute to respond.

MR. ZHOU: Sure. Thank you very much, Mahyar, for a very useful, very helpful discussion. And, you know, some of the comments you raised we are actually looking into that right now. So let me just get to your comments first.

You know, this pecking order of liquidation. So we're getting the cash holdings of this mutual funds and, you know, our focus is really not on understanding mutual funds' behavior when facing redemptions, our focus on understanding the their effect on the line market. So, you know, tests we're doing include sort of how does the impact of different mutual fund ownership differ depending on their cash holdings.

Presumably those held by mutual funds with more cash holdings than the impact on the underlying

would be much fast forward. So that's what we're doing.

Now going back to the first question of why there's not much difference between these two types of bonds during the crisis. We are actually also kind of puzzled by that. Now one thing I could imagine is that these are the sort of the aggregate plots so there's a lot of sort of selection by us in terms of what bonds are traded in the crisis versus the others. And when we control for this basic effect in some other the regression analysis we do see that, you know, there's some difference between these two type of bonds during the crisis. And, you know, another possible reason there might be some sort of spillover effects across different type of the bonds during the crisis.

And lastly, you know, what's the difference between primary dealers versus non-primary dealers. Unfortunately our dealers do not have revealed identity so far so we cannot tell any difference. But the reason why you observe different patterns between the primary dealer positions versus our plots is that, you know, the plots you see are based on the FI of the core data which you saw the sort of aggregates, the dealers' aggregates.

Now in this paper we only targeted the secondary market, so it does not include the inventories from the new issues. And that could explain the difference between these two figures.

But again, thank you very much for your great discussion.

MR. BERGSTRESSER: Great. Yeah, thank you, great paper, great discussion. We're right on time for the final paper that we have today. So this is where the presentor is going to be Ivan Ivanov of the Federal Reserve Board in D.C. This is the work of a team of authors at the Fed and at the University of Cologne. So he'll present, he'll have 15 minutes to present and then we're going to have a discussant, so Emily Swenson Brock of the GFOA will be the discussant.

And so I see Ivan there. Take it away.

MR. IVANOV: Let me share my screen. Thank you, Dan. Okay. All right. Thank you very much for inviting us. This is joint work with Tom and Nathan. And before I go any further I should say the views expressed here are our own and not the ones of the Fed.

Okay. So what is the main motivation for the

study? So this figure here on the left comes from what other people were telling where we show that state and local governments have increased their reliance on bank loans and other types of private debts. And this rise has really quite steep. You can see that since like 2009 or ’10 the bank loans like is a source of funding for state and local agencies. It has more than quadrupled over that timeframe. And you can see a smaller trend for muni bonds held by banks that to some extent are also private debts.

Now why do we care about this trend? Well it’s because adding such claims to like moving debt structure is likely to affect new bond holders. Okay. So again, in our other paper with Tom, we showed that bank loans give significant short on maturities than bonds of the same entity. And they’re very likely to be secured by revenues that are specific, highly specific. So it may be the case that in March, number of these cases but there are many private debts could be more senior than the bonds of the same entity. So we need to worry about it, we need to be able as a market to like observe this.

And so I want to highlight here is that there were no disclosure requirements for this type of claims until early May of ’19. And the agency has seemed to like remedy its concerns by issuing a rule in 2018 that became effective in early ’19. And so what we do in this paper in a nutshell, we studied whether this regulation has been effective for the past several years.

So let me just briefly highlight what we find in this paper, and then I’m going to like take a deeper dive. So we show that roughly half of the muni market at this point is required to report private debt. Whenever filings occur about such obligations, the information content varies widely, as I’ll show you in a little bit. But whenever, the market views these as being informative.

So in the second part of the paper we used confidential data from the Federal Reserve and showed that about only 20 to 46 percent of reportable bank loan events get indeed reported on GMS websites. So you see a vast under reporting.

And so although what we conclude in the paper

is that such type of debt remains a significant source of risk for muni bond holders.

All right, so for the background. So more specifically, in this paper we started the amendments of SEC Rule 15c2-12 which was finalized in August of 2018 and implemented in February 27, 2019. So in a nutshell these two quotes show two main areas where the rule like requires additional disclosure.

So in the first quote it basically said that by agreements to like such debt have to be reported now by issuers. And the second quote shows that any material modification of terms of such financial obligations that are related to financial weakness also have to be reported.

Now what's really unclear here is the extent to which the rule like is going to pick up the economic reality in this market. And so like why is that the case? Because if you go back to the first quote you can see that there's some ambiguity as to whether the rule applies to like originations of loss or however, debt negotiations or whether it applies to both, because agreement here could mean both.

And then like second it's very important to know that they can just market in the muni bank loan markets the renegotiation of however debts occurs very often, and if that changed the term of the loans by a large amount. Okay. So more on this a little later.

Now so who is under this rule like? So I said like at this point we have half year off of the market. So the bar for whether you are subject to this rule is pretty low. So issuers that issue bonds with an amount that exceeds at least $1 million are subject to the rule. So this issuance has to happen since the implementation date of the rule. Like that's another key part, so since February 27 of '19. And the rule exempts issues that are sold to a small number of sophisticated investors in large denominations or short term bonds that are also sold in large denominations.

Now it is very important to emphasize here that the DSAC is an agency of the Federal government, doesn't have authority over states and local governments. So the DSAC has authority over the underwriters that underwrite the bonds in the states. So basically the underwriter here shares the

responsibility to enter into continued disclosure agreement with the issuer, under which issuers have to report all agreements that are material.

So okay. So basically I'm going to now get into the data or main data set comes like from this accrued data from MSRB, the same MSRB municipal disclosure feed. Our data on bank loans comes from the Federal Reserve, like we have very rich data at the loan level. These are loans extended by the largest banks in the states. These loans pretty much account for three quarters of the market, of the muni bank loan market. You like observe information along the loan amounts, maturity rates, like most things about the loan basically.

And we use other data sources that I'm not going to go through now for the interest of time that there's standard in this space.

Okay. Disclosure requirements. So I mentioned that by this point in time, by April of this year, we have roughly half the market being subject to the rule. You can see from this figure so most of these issuers are those that have issued recently or that have

gone back to the bond market pretty often, that's like that black dash line. And then the red line says that there's like some number of like small number of issuers that haven't issued recently that also become subject to this rule.

What's important to note here is that the issuers that are subject to the rule now are the larger entities that have greater reliance on like the muni bond market. So that's all you need to know for now. Like we do more in the paper but it's like it's not as important to emphasize.

Okay. So let's see the filings, how they revolve since the implementation of the rule. So the rule is implemented, like I said, at the end of February of '19, and there have been since then like a total of about 5,800 like filings that missed obligations incurred since the implementation of the rule. And so since that timeframe you can see that most of the findings are voluntary and so these are filed by issuers that are still not required or don't fall under the rule yet.

And then this pattern has reversed only last

summer so we see the solid line here, like it's about the hash line in August of that year. And so I think what's striking here, like what is striking here to us is when we started working on this paper is that had only been 2,200 mandatory filings relative to about 13,000 issuers that are subject to the rule. And so this is really, really small. You expect to see way more action because here as I showed you, bank loans have renegotiations, you have things that change all the time, even originations should account for more than this.

Okay. So basically what we do in the paper next is we try to measure the information content of the filings. We detail like we hand collect information from about 2,300 filings. And basically we like manually read through them. And so what we find is even though most of them like show you the amount, some of them like do not show information that's really key to trying to figure out what you're getting into. And so about the third of the filings you don't have debt maturity or like the loan rates. The majority of the filings don't have a summary, which make it really hard

for retail investors to figure out what's going on. And yet many of them exceed like hundreds of pages of legal text.

So let me give you this best case scenario, this example of filing which has pretty much everything you need here. So we have the lender, S&T bank, you have the entity that took the loan. They have the amount, interest rate, like the maturity, and they have other terms. But I just want to state here, this is the best case outcome. Most of the time you don't see something that matches this.

Okay. So we also measured information for contents of the filings for our current events study. So we compared abnormal bond returns by like when the filings occur and basically we split the sample here into four groups which I'm going to show you on the next slide. So what you have here in the first three columns is the mandatory filings and then in the last three columns voluntary ones. You can see that our findings to do it entirely from mandatory ones. So it looks like here that mandatory filings, they have significant information contents.

And what's interesting also is that prior to the onset of the COVIC pandemic the market used to respond as negative piece of information, and this trend like reverses afterwards. So this is very key. So what does this like later finding mean? It means that like if you obtain funding in a time of stress, anyone you can obtain funding with is good news, like basically.

Okay. So then these results come from the higher risk groups pre-pandemic, and then they come across the risk spectrum afterwards. I'm not going to spend too much time on this. And I'm going to go through some of the greatest part of the study, the last part, where we gain insight into whether there is significance in the reporting of this type of debt.

So what we do here is we like identify major bank loan events from the Y-14 data from the Federal Reserve. We have both negotiations and originations. And we studied these separately because as I mentioned to you earlier, that because of like some ambiguity in the rule, the market interpreted that the rule only applies to originations.

So just to show you the main result here for

all events we find that only about one fifth of like events that likely like significant and reportable get reported, like with the red lines right here. Originations you see higher like reporting rates but still quite low. I mean you only see about 46 percent of the bank loan events that should be reported getting reported. And just want you to see here that the issuers that do not report, they carry substantially higher risks than the issuers that do like report.

Okay. So in the final slide here I'm going to like mention one of the first thing we check here is whether these agreements are material to like each entity. And we find that the vast majority of them are indeed. So the underreporting that we find is not due to that. We also check with the underwriters, could be some like small underwriters that may not be able to like enforce the rule. That's not the case. We find that the vast majority of the issues that lead to continuing disclosure are underwritten by the largest banks out there.

And so overall we argued that it's rule ambiguity in line which lower issuer sophistication that

may lead to what you see.

So to conclude, we shed light on the effectiveness of the market's impact of the recent disclosure regulation in the muni markets. We showed that whenever such disclosure occurs it is likely to be like informative for new bond investors. But we also find that issuers underreport significantly such claims. So overall such claims appear to be a significant source of risk for muni bond investors.

Thank you.

MR. BERGSTRESSER: Ivan, thanks very much for that fascinating work. It's a great honor to have Emily Brock to discuss that. So turn it over now to Emily.

MS. BROCK: Thank you so much. And thanks, Ivan, for going through that with us. I've got to just say again to Dan and to Brookings, thank you so much for having me. But also thanks to Ivan, Tom, and Nathan for all the work that you've done for this paper.

Just a little bit of background. I'm sure attendees might actually know about the Government Finance Officers Association, but we represent over 21,000 issuers of public debt. And I was able to read

the paper through the lens of my members in the GFOA community.

And just a tiny bit of background about sort of how I approached it personally. The work that I do with GFOA is to exam issuer and industry initiatives that would enhance disclosures. Some of those things we use our best practices. Other things of course we comment regularly on SDC and MSRB about proposals to enhance the areas that we work in. And also we host a number of industry initiatives, and one of those is the disclosure industry work group with the market participants, and so we think it's a collaborative approach is usually the best way to finding industry best practices to create a good experience and a better product in the end.

But I did learn a lot from the paper. It was fantastic. I really enjoy Figure 3 showing how much disclosure in each category, the timeliness and the consistency of the disclosures on Page 16 and in Figure 4. But digging into the content of the paper there's just a view overall kind of point that I'd like to sort of bring to the fore.

First of all, data. And, Ivan, you kind of went quickly through your data discovery. But your data discovery is intense. Ivan and I had a chance to talk, and a lot of it was done by hand. And I think what we can do together, the industry and of course academic, is we can use this opportunity to see what EMMA can be.

Normsters (phonetic) is 13 years in our rear-view mirror and EMMA is now, you know, part of our disclosure documents of repository. It is our document for disclosure repository. We worked very closely with the MSRB to get some ideas on how they may be able to enhance the user experience for issuers in EMMA. When the issuer experience is enhanced we bet that it will also be enhanced for stakeholders like the academic community but also others, you know, in the industry that may need this type of information to not have to do everything necessarily by hand. But we think that this is certainly looking at the difficulties that you had and the challenges in making the data happen, certainly we communicate regularly with the MSRB about enhancing that.

The other basic sort of overall arching notion

that I kept thinking about as I was reading the paper is timing. You note in the findings that there's some possibility that there may have been some underwriters and maybe issuers who may not have been fully aware of the amendment when you were digging up the data, on Page 23 and then again on Page 24.

GFOA has a long-standing best practice that it urged issuers to meet their CBA requirements, and information that is already developed within the government should be considered for voluntary disclosure. So prior to '15 and '16, we suggested bank loans become voluntarily disclosed. And then after '15 and '16 we became very quickly informative to the issuer groups to make sure that they understood what that looked like.

But I'd say over the past 10 years generally industry efforts have helped with voluntary disclosure related to pension disclosures, the bank loan disclosures. I find it very interesting that there's sort of that uptick in disclosures that happened as you saw them, but I do think that there is another interesting way to sort of approach the paper. I think

there's three different narratives maybe in it.

The third overarching thing I did want to mention is on Page 1, one of the words that I was looking for or scanning for is the notion of materiality. Materiality is a major confect in our world. And you read them in 15c2-12 and of course in Event 15 and Event 16. Material means that you as an issuer are working with your bond counsel to make that determination. And I really didn't see a lot of influence of the fact that issuers lean very, very heavily on counsel to offer their opinions on that. And that intermediary effect may have some sort of ignogous (phonetic) factors on whether or not they will disclose or not.

But now on the contents of the paper, generally, like I said, I saw sort of three papers in the middle of this. The first is the major question, Ivan, which is rule ambiguity. Does negotiations or restructuring debt along in 15 and sort of your struggle with what constitutes a reportable event. But the GFOA, we have a long history of making sure transparency happens in the municipal marketplace. And what we do is

we say we urge our members to disclose material events to the investors. So establishing that materiality is important to make sure that the relevant information is passed along to issuers. It's made on a case by case basis and that if material qualification needs to be established before you establish key parameters.

But for the purpose of this paper, or maybe even an enormative exploration of the concept of materiality and another paper, I would suggest kind of really digging into that concept.

Also consider, like I said, the players at the table. There are underwriters, they are held to the 15c2-12 standards on counsel. There is issuers but there is also municipal advisors, there's a lot of people that sit around the table and make sure that those disclosures and those decisions are made. Less municipal advisors, of course more bond counsel.

Now recently GFOA has led industry efforts to educate issuers and encourage material voluntary disclosures on ESG matters. So there could be a notion here where if you do dig into materiality and it ends up being an important variable in making the determination

of disclosing bank loans, we think that there's certainly an extension of that academic exercise to ESG matters, COVID impact, there could be a lot of extensions from here.

The second theme I find your paper was information content and complexity. You used the word informativeness of the disclosures and you point to the boilerplate disclosures as a major frustration. And on the other side, missing or imperfect information, which is so important to us. It's very central to what we do. The MSRB plays a certain role in those boilerplate disclosures. So again, another person sort of at the table when they're having that conversation. But, you know, from an issuer perspective if it's boilerplate, you know, of course then you are provided the protections of the words. It is certainly a different perspective from an institutional investor and a retail investor kind of looking at the boilerplate language but we don't know that that's going to go away any time soon. So I would just make sure to sort of focus on the underrepresented information.

The third paper, and I though the most

intriguing part of the paper, was your COVID-19 disclosures and information needs during market ambiguity. Of course that sort of justs the position, the yin and the yang of, well before COVID if you did disclose your bank loan it was worse off for you than after. But then after COVID you realize that if you disclose the bank loan the markets actually kind of appreciate that's you have sources of capital and that you can get those.

I think that that really is in and of itself sort of its own paper. Certainly a conversation about I think really about the emotion of our market, that people are certainly interested to know when communities are doing okay in a time of crisis, that that's an okay thing. So I found that that COVID-19 disclosure section to be especially interesting.

And finally, the relationships that you discussed are extremely interesting to me. I think it goes a long way to answer the question about awareness and capacity issues of issuers to comply with these requirements. So, Ivan, you and I talked offline about this. Data constraints of course are challenged, but it

may be interesting to look at different market sectors like independent school districts or other smaller issuers or even special purpose districts and how not just credit ratings, instead a better understanding of the participants in the market and how they then have been able to interpret 15 and 16 and how they have been able to disclose in the wake of 15 and 16.

And then you also start to explore this with underwriters, which I thought was very interesting at the very end, maybe suggesting that smaller underwriters may have awareness or capacity challenges themselves but ultimately you found that it's not really the smaller banks, that it's the bigger banks. And so I think that incident of the disclosures is I think an intriguing sort of area that needs to be explored further.

So I just want to say thanks again for the opportunity to review this paper. And I look forward to any questions from the audience, as I'm sure they have many.

MR. BERGSTRESSER: Yeah. Thanks, Emily. And, Ivan, I think you're their -- Has Tom Zimmerman been included in this as well?

MR. IVANOV: Yeah.

MR. BERGSTRESSER: I know he's somewhere in the building.

MR. IVANOV: Tom is here, I see him on Zoom here but I don't see him on the screen though.

MR. BERGSTRESSER: Tom has just been promoted so I want to give Ivan and Tom the opportunity to respond and I'm sure we're getting questions in our chat. So do you want to take a moment, Ivan, to respond to Emily's comments?

MR. IVANOV: Yeah. So I just wanted to say this is extremely helpful, it will really help us improve the paper. And thank you for being so kind. The chat we had last week was super helpful, like we already started to think about what we can do with like for the next iteration.

I think exactly I agree with you on owners I do need to like explore this more. And I agree with you that materiality has to be like really up front. We do work on it but somehow we showed it beyond the paper so that's not how it should be, so we need to elevate it more.

And for the content of the filings, I agree, I think maybe like you said, it's like the wishful thinking, that basically you have like simple summary for everybody but they think it would be a big win if say everybody files.

Yeah. Other than that I think like definitely I think like one of the most important points that we need to address going forward is like you said, I'm going to call on this, who sits on the table, like the bond counsel, the underwriter, and then the municipal advisor. So we need to look at that, and we can look at that. Mergent has this information. So like we're going to be working more on this.

So at this point I'm going to give the floor to like Tom and see if he has any additional points.

MR. ZIMMERMANN: Thanks. It was a very nice discussion. I just wanted, I don't think I have much to add here at this point, but just to say something on the materiality. I think you want to maybe talk about this in the slide today but we did do some work on that already so we compared the undisclosed loans to, the volume of the undisclosed loans to the volume of

disclosed bonds, and we do find that often these undisclosed loans are in a similar ballpark, the amount of the most recently undisclosed bonds that issued. So it's not, it seems to be material in that sense.

MR. BERGSTRESSER: There are some questions that are coming in in the chat and so I want to pose the first question, so the curator of the question. We have a question from Dan Garret, who I think a lot of people here know.

Dan asks have the new disclosure rules had an impact on the activities of credit rating agencies or is private debt something that they were already accounting for? Is there any changes to the way the credit rating agencies are processing the ratings with this new source of information?

MR. IVANOV: So I can take this one. So basically the agencies were already starting to account like to count this debt into the riskiness of the entity I think to the point where they're able to like observe such debt, they would incorporate it, but most of the time they wouldn't be able to like observe it. And I think CMP had a statement in 2017 or 2018 and this kind

of made its way to the Financial Times, the Wall Street Journal. I think basically urging issuers to report such debt because if they don't and if they find out that issuers had such debts and they're going to lower their ratings.

But I'm not aware how they can enforce this actually if like an issuer like would never report it. And I think this case is severe, especially severe for the smaller entities. I guess one way to find out is if you look at the annual reports you can look at overall debts and then I know that my GFOA has like a separate rule there that requires basically such debt to be reported in the statements. I don't know like how much information is reported there but I think you can find some information there. So I think going forward this could be enforced by both rating agencies and the underwriter.

MS. BROCK: Can I say too, the rating agencies are definitely looking at parity and notions of where that new debt ranks. I mean their analysis is how can you pay back your debt? And so that's their primary interest, of course bank loans does play a role, has

historically played a role and I think they were active in this discussion when the rule was being developed.

MR. BERGSTRESSER: There's a question that's coming in the SLI.DO question, an anonymous question. And it basically boils down to the extent to which banks may be discouraging municipalities from disclosing the obligations. Is that something that you've encountered, and how is that playing out in your data, how's that playing out in the market if banks are, you know, twist the arms to try to keep this from being disclosed?

MR. ZHOU: I don't think we can observe that. So I don't think we can say much to that end. So it's unfortunate but like we can't.

MR. BERGSTRESSER: Emily, is there something you --

MS. BROCK: In your paper you discuss the redaction and that certainly was a major part of the voluntary disclosures, that there was a lot of information that was redacted in order for banks to remain competitive with one another.

MR. ZHOU: Yeah. So I just wanted to mention on this end you can almost never see the fees that is

being charged for the bank loan. So that information is always missing. You can oftentimes not see rates like we showed with Tom, so, yeah. Redactions, I'm not sure whether this counts from the bank though, like it could be coming from the entity either, right? Like so it's not clear like which side it comes from.

MR. BERGSTRESSER: There's one last question which has just come in from Kate Yang. And the question is basically what are we seeing with state regulations, so think of California where there are state requirements for disclosure. Are you getting any more information in those places, or how does this play out differently in places where the states will force some disclosure versus places where that doesn't happen?

MR. IVANOV: So I can take it or maybe Tom can take it either way. I know I took like most of them so far. So, Tom, would you like to do it? Okay. So I can take this one too.

So basically I haven't looked into that. I know that some states have required it. I think two of the larger states, so you mentioned California, and New York also has pretty strong regulation on this end. So

I looked at these data previously and I think there's lots of information there but I think the filings sometimes would be really include more information sometimes to include like less. So it's not really clear. And then it's only two of the large states are requiring that so that's clearly not enough.

For New York I think there is pretty neat information but I'm not sure if bank loans are fully covered or just at least in part covered, so I need to look into that a lot more. But I think what's neat about the information is they have reporting every year, so you look at the financial statements are available up to basically now.

MR. BERGSTRESSER: So we have now hit the end of the time that we have allotted for this. I think it's been a great discussion. I hope everyone watching at home will join me in giving applause to everybody that's participated today. It's been so far a fantastic day.

We're going to take a nine minute break. So we'll reconvene at 2:15. And at that point David Wessel will lead what I think is going to be a great panel on

municipal disclosure in the COVID-19 crisis. And so I'm going to mute and hide myself, and then when you come back at 2:15 David Wessel will be in charge and will be moderating that panel.

(Recess)

MR. WESSEL: Good Afternoon. I'm David Wessel, Director of the Hutchins Center. Welcome back to the 10th Annual Municipal Finance Conference. I want to thank my friend Dan Bergstresser for such excellent moderation of four terrific papers. We're now going to do something slightly different. We want to ask the question here on this panel, what do we know about how COVID-19 affected the finances of state and local and particularly state governments, and we have three presentations from very different angles.

First, in a nice segue from Ivan Ivanov's paper of a few minutes ago, Marc Joffe of the Reason Foundation has tried to look at the municipal bond market disclosures about COVID using text searching to see what do we learn about what they disclosed and then we're going to turn to some people who have a great deal of knowledge about what's really going on, Kim Murnieks

who oversees the budget of the state of Ohio and Brian Sigritz from the National Association of State Budget Officers.

As many of you know, COVID was an extraordinary experience for all of us. For state and local governments, we went from the panic stage where they thought their revenues were going to dry up where they, a lot of them, cut their workforces to the federal aid stage to then discovering in many places that revenues held up quite well in part because federal aid to unemployed people in many cases was taxable, and in part because unlike past recessions, the stock market rose rather than sank.

So after we hear from Marc, Kim, and Brian, we're going to be joined by my colleague Louise Sheiner from the Hutchins Center to see if we can get a conversation going. As before, if you have questions you'd like to pose to any of the panelists or just comments, please use sli.do, and you can go to #MuniFinance, and I'll keep an eye on that.

So with that, I'm going to start with Marc Joffe from the Reason Foundation.

MR. JOFFE: Thanks, David. So we looked at how the MSRB responded from a disclosure standpoint to the COVID crisis and it was actually quite impressive how quickly and how thoroughly MSRB addressed the issue of COVID disclosure. So about a week or two after the crisis started, MSRB started posting occasional reports showing, you know, a summary information about COVID disclosures and then details of each disclosure.

Ultimately by the last report which was earlier this year there were a total of 14,000 primary market disclosures that referenced COVID-19 and over 40,000 continuing disclosures. So it was an immense effort. MSRB was able to leverage the work it had done in terms of text searching disclosures that its been collecting over the years and moving to the Cloud, so it was quite a robust response in that sense.

The problem is that, when you're looking at 40,000 continuing disclosures, some of those are going to be more interesting than others, and in fact, many of them really just had boiler plated as I'll show you in a minute. What MSRB attempted to do is to do a word count method of distinguishing between really COVID

disclosures versus those that might have just incidentally mentioned them, so they essentially looked at all the words in each PDF disclosure, identified certain key words like COVID-19 or pandemic and then counted those words and then established buckets, five different buckets for the word frequency with bucket number 2 being the mode of this distribution.

So unfortunately, when you rely strictly on wordcounts, things that are boiler plate can still get through, so here we're looking at Alabama's Annual Comprehensive Financial Report from 2020 where there were six references to COVID-19 or pandemic, but all of these references are really boilerplate in nature, so for example the COVID-19 pandemic is causing economic disruptions, long-term impact is uncertain; not really, you know, news you can use as a municipal investor.

On the other hand, you can get really dense disclosures, and this is from the Olaf Health Systems Event Based Disclosure in Candace (phonetic) a few months into the epidemic, and you can see, you know, real specific information about rates of admissions going down, surgeries going down, overall clinic visits

increasing, and then, you know, $3 million in COVID-related expenses.

So this is when we think of a COVID-related disclosure and how it might impact the ability of a municipal borrower to repay, you kind of think of this type of disclosure even though it might not necessarily do that well on the wordcount.

So a couple of approaches to perhaps build upon what MSRB has already done, so an analysis that I conducted with my friend David Lucci, what we did is we looked at the percentage of words in the document rather than the raw number of words, and that's how this document here, the one from Olaf Health Systems, popped up into our top 20 list because it had a relatively small number of words but there were a lot of COVID-related words within those small number of words, so it's going to tend to privilege the events-based disclosures as opposed to the annual disclosures which is probably about right for this.

A more elaborate technique is used by an external vendor DPC Data, and what they do is they have an analyst review all of the disclosures to determine

whether it's really a COVID disclosure or whether it's something that mentions COVID parenthetically within a broader context, and you can see that they've released periodic reports that show the frequency of these disclosures, the last one and did in May of 2021.

So what could we do maybe for the next crisis? You know, hopefully there won't be a next crisis, but it seems that crises are inevitable, so what if a market-wide crisis like this would occur? Well, first of all, as I said at the beginning, MSRB really has positioned itself very well in terms of, you know, having the entire corporates of text and the ability to search it. But as we've seen just doing text searches has limitations, and so right now the best practice is to have a human analyst get involved.

In terms of how we could potentially improve going forward, adding fixed fields like a multiple choice or a fill-in response, like how much money do you think you are losing as a result of this crisis, fill in amount here. That could be something that would be much more easy for investors to analyze and act upon. And that doesn't necessarily mean that we have to replace

the sort of text-based SA form, you know, free-form kind of answers that we currently see on municipal disclosures. They could supplement it.

And within those text-based or free-form disclosures, we could think about maybe tagging relative facts which is something that extensible business reporting language used currently in the corporate sector and overseas with could potentially bring to the party. And so with that, I will turn it over. Thank you.

MR. WESSEL: Thank you. So now we have the great luxury of going beyond what happens to show up in disclosures to what's actually happening from somebody who actually have to make it happen. So, Kim, I wondered if you could talk a little bit about what's it's been like in Ohio for the last couple of years, and what do we know now that we didn't know before and where are we going? It's a yes or no question.

MS. MURNIEKS: All right, thank -- sure. Thank you, David, and good afternoon from Ohio. I'm Kim Murnieks. I'm the director of the State's Office of Budget and Management and really happy to be here today

to talk about Ohio's budget story over the past 18 months or so. It has definitely been a challenge, but it is a good story to tell.

In Ohio, I like to say we tackled the pandemic head on both from a health and a budget perspective. Governor DeWine made early decisions to protect lives and so we are now in a position where we're able to make investments in our state's future and our new budget because we did take those immediate actions early on to ensure that we remained balanced and, you know, really started very early when we saw the pandemic even before it was considered a pandemic starting to affect China and Asia in early 2020.

So in February of 2020, even before we had a single case in Ohio, we started what I call a soft hiring freeze in state government, so we knew at that point in time or we had reason to believe that even if the pandemic itself and the health effects were mainly affecting overseas that that would have an impact on our economy. Ohio has a global economy. If we were a country we would be the 21st largest country. We're the seventh largest state in the nation, and we knew that

what happens overseas would affect our economy even though we were in a really good position in February of 2020.

So we took those kind of early initial measures, slowing down state hiring looking at our overall spending, and then in mid-March at a point when our state general funds were still about $215 million overestimate through those first eight months of fiscal year '20, we instituted several direct cost containment measures including freezing state government spending. We instituted a contract freeze and a travel freeze for all expenses except those activities directed related to the pandemic, and we asked every state agency to put together a budget cut scenario at that point in time.

MR. WESSEL: This is March 2020?

MS. MURNIEKS: This is March of 2020, so again, very early on. Through the end of March of 2020 our revenues were still ahead of estimates, about $89 million still ahead at that point in time, but we continued to be proactive, and we took more measures to ensure that our budget would remain balanced including executive order budget reductions in early May of 2020.

So that was, our April revenues were hard hit by the pandemic, and so we were already prepared because we had asked agencies to put together reduction scenarios in March and April, so we were able to actually institute those reductions in early May, and then that put us on firm footing to close by June 30th with a balanced budget. We continued those proactive balanced budgeting measures into the uncertainties of fiscal ’21 that put us in a position to kind of lead on the economic recovery.

One of the things that we did in June of 2020 to set up Fiscal Year ’21 was through refinancing state bonds. We did a major refunding and restructuring of 780 million in state debt in June of 2020, and that achieved $363 million in Fiscal Year ’21 cash flow savings and it was at an all-in true interest cost of 1.54 percent.

That was the largest state general obligation issuance in our history and the largest that our public facilities commission had every transacted. It was also our largest transaction in state history underwritten by a minority business enterprise, and a woman’s business

enterprise Saganas (phonetic) financial advisor, so that transaction really demonstrated that we are a strong investment, and in fact when we were in the market the transaction priced at lower yields than a higher rated GO Issuer that was in the market on the same day as us, so that was I think, you know, an indication to us that our balanced budget measures were recognized and that Ohio has continued to be seen as a strong investment.

So we continued throughout Fiscal Year ’21 to align our state government spending and staffing and all of our essential positions continuing hiring restrictions, but because we had taken early action, we were able to avoid any major disruptions like massive across-the-board layoffs. We were able to reduce our staffing by about 1,500 employees across state government just through attrition and by managing our hiring processes throughout that freeze, and that enabled us to maintain all of our essential services.

We also managed our federal funds very conservatively, so we used our federal coronavirus relief funds that were allocated through the CARES act not to kind of prop up state government spending but to

help our local communities, so we fully shared 45 percent with our local government. We ensured that those dollars went into every community in our state. We supported schools with those dollars, virtual and hybrid learning, colleges and universities to keep our campuses safe. We provided relief to our hospitals and nursing homes and health care providers, and we provided economic relief to small businesses, those that were hardest hit by the pandemic, childcare centers, so all of this was to ensure that we didn't use those one-time dollars to kind of prop up state government ongoing expenditures, you know, artificially.

So we kind of managed our general fund on the one hand while using those dollars to respond to the pandemic and to ensure that the expenses related to direct pandemic response were not borne by our state taxpayers but were borne by those Coronavirus relief funds. So all of those deliberate actions really put us in a position going into our current, what's now our current fold day old new biennial budget for fiscal years '22 and '23 which was just enacted by bipartisan votes in our legislature about 12 days ago, and that

supports Governor DeWine's vision of investing in Ohio's future.

It prioritizes health, renewing our communities, and reigniting our economy, so continuing our conservative approach to budgeting and continuing to use one-time resources for one-time investment but one-time investments that we know will pay recurring dividends into the future, so it includes $250 million for broadband expansion, $500 million for community revitalization including money to demo old structures and to redevelop brownfields.

It continues our successful H2Ohio water quality program because we know that access to clean, reliable water resources is crucial for our state's long-term economic success. It also continues to invest the new recovery funding, the new state fiscal recovery funds through the American Rescue Plan act into sewer and water projects across the state.

We also continue to provide relief for our businesses that are hardest hit by the pandemic including bars and restaurants, lodging, entertainment venues, and new businesses that have the kind of unlucky

timing to start right when the pandemic was starting last year. We're also using our Upper Dollars to pay off our state's unemployment insurance trust fund advancement that we received from the federal government so that is not kind of hanging over our businesses and our economy.

So we also have historical holds on investments into our workforce including money for both adults and high school students to get credentials for in-demand jobs, and we continue to support our schools. We have a new school funding formula that invests both in student readiness and student wellness which is critically important as we move out of the pandemic but also includes dollars in as a new formula to ensure that our schools are adequately funded going into the future.

So all of these investments in kind of this whole story I think, we think here in Ohio that it shows that our approach has paid off and our fiscal outlook is strong. We are strategic and structurally balanced and we're rebounding, so we are seeing unemployment rates that are lower compared to the nation. Our employers are hiring in every community. We're getting Ohioans

back to work.

And also to close out Fiscal Year ’21, which ended, again, just 12 days ago, our tax revenues rebounded. We closed that fiscal year $1.5 billion, roughly 6 percent ahead on general revenue fund tax revenues compared to our estimates for the year, so that’s the Ohio story. It has not been an easy year and a half, but I think our example shows that strong transparent and conservative actions have paid dividends so far and will continue into the future.

MR. WESSEL: I want to understand on your last point. So fiscal ’20-21 revenues were 6 percent ahead of your projections --

MS. MURNIEKS: Correct.

MR. WESSEL: -- how did they compared to 2020; were they ahead of 2020 or below?

MS. MURNIEKS: They were ahead of 2020.

MR. WESSEL: And is that because of conventional income taxes or what was driving the revenues?

MS. MURNIEKS: That’s a great question. Our largest overages were in sales taxes, so both our non-

auto and our auto sales taxes I think, you know, we saw similar patterns to other states as the economic impact payments from the series of federal bills. Three separate rounds of economic impact really did spur consumer spending both -- and we also saw, which I think a lot of other states saw, a shift during the pandemic from spending on services which Ohio largely doesn't tax to spending on goods which we do tax, so that benefited our sales tax revenues as well.

MR. WESSEL: Understand.

MS. MURNIEKS: But we did also see overages in our income taxes just not to the magnitude of the sales tax and so as we've projected and looked at the future, we have taken that into account. We've actually looked at some of those sales tax recedes essentially as one-time revenue. We want to make sure we're not being overly optimistic about what will continue. We've kind of built in that the impact of the various rounds of stimulus will wane and so we've built our balance budget based on all of those notions, and we passed a budget that maintains a significant carryover into '22 and '23 as a buffer against any potential future downturns.

MR. WESSEL: Thanks. Okay, I want to remind people that if you have a question for any of the panelists or a comment you can use to sli.do#MuniFinance. Now, I wanted to turn to Brian Sigritz. Brian, Kim gave us a great case study. I'm sort of curious what you see across the country, and I know you have some slides. And I should mention that Marc Joffe has a longer paper which we've posted on our website along with all the other papers for the conference and all the slides.

MR. SIGRITZ: All right. Thank you, David. Hopefully everyone can see my slides all right and I -- if that's okay. Yes, like David said, I'm Brian Sigritz from the National Association State Budget Officers, so we represent the governor's budget directors and budget staff from the 50 states dera cores (phonetic) in D.C., so Canada is one of our great connective members and not just (inaudible) Ohio, but what I was going to do today was talk a little bit about what we've seen so far for states, the impact from COVID, the impact of federal aid, and then also talk about the outlook we see for states here moving forward.

So what we saw for the states, and while this is going to dovetail nicely with what Kim was saying with Ohio's perspective, in the end of fiscal 2020, we saw state revenue significantly impact that last quarter of fiscal 2020. Forty-six states began their fiscal year on July 1st; that was the April and June period of 2020, and we did see actual revenue declines to the fiscal year in 2020 even though the impact was only felt in that last quarter of the years.

So during that time period we also saw states sharply reduce the revenue forecast for Fiscal 2021. Some states reduced revenue forecast by up to 20 percent, but as we moved through fiscal 2021, we did not see those revenue declines that we were anticipating, and there is several reasons for that. One was due to the federal stimulus measures that were passed. They helped to pump a lot of money into the national economy and since state economies are so closely tied to us by the national level, those also helped to strengthen state economies, also the federal aid that as applied to the state in low egality (phonetic), so it's beneficial.

And, you know, if you look a little bit at the

specific revenue streams, on the personal income tax side what we saw was by and large this downturn impacted low wage workers and high-income workers weren't' nearly as impacted in some instances, not impacted as all instance. Most states for their income taxes rely more heavily on high-income earners, income taxes weren't as impacted as states were anticipating and weren't as impacted as we've seen in prior recessions.

On the sales tax side, there's two things going on, Kim mentioned services which most states don't (phonetic) impacted. That was the area where we saw more decline and not in the goods and the physical products. Then also state's ability now to tax online sales has been beneficial in this downturn as all (phonetic). But all that being said, all states were impacted by this downturn.

They were impacted in varying ways in different magnitudes. We saw some of the hospitality in tourism states significantly impacted right from the get-go, also some of the severance states that rely heavily on things like oil and natural gas, and even though that states have fiscal conditions continue to

prove they're not quite back to the levels where they were before the downturn, and I have a couple of slides getting into that a little bit more.

First, some mostly slides upcoming come from our spring fiscal survey of states which was released a couple of weeks ago in June, so this report looked at governor's budget proposals for fiscal 2022 and will be coming out of reports in the fall looking at enacting budgets for fiscal 2022.

Here you can see some variations between what states enacted for fiscal 2021, so this wasn't governor's budget proposals. This is what was actually enacted fiscal 2021 and what was recommended for '22. We did have enacted cuts and number various for 2021 whereas in fiscal 2022 we saw increases in nearly all program areas.

This slide looks at some strategies states took that deal with the impact from COVID-19, so even though the revenue declines weren't as significant as it was initially anticipated, we did see states take various actions, things like targeted cuts, different personnel actions, fund transfers, and those sort of

things, so, you know, the states were impacted and we did see states need to take different actions to help negotiate and move through fiscal 2021 before the revenues started to improve.

This looks at a number of states that made midyear budget cuts going all the way back to 1990, and hopefully you can see that end of this slide it might be cut off here in this view, but then fiscal 2019 we had 0 states make midyear budget cuts which is the first time that we have had that going all the way back since we've been tracking this; 2020 we had 19 states make it, and in 2021 we collected the data, we had 12 states making midyear budget cut due to a shortfall.

It's interesting. If you compare that to some of the prior downturns, those levels aren't nearly as high as what we saw, take for instance the Great Recession, but also the recession in early part of the 2000s when the Pec oil burst in which didn't impact state revenues nearly as much as the Great Recession, but we still saw 37 states had to make midyear budget cuts in both those years. So I think that, you know, does show once again that how quickly state revenues did

start to rebound and also the impact of the federal aid that was provided to the states.

I think this slide's a good one to show, kind of showing what happened with revenues, so the first bar on the left, this is spring 2020 forecast before COVID-19, the green one in the middle is a fall forecast after COVID-19, and the pandemic began, and then the bars on the right are what we are seeing in governor's budget proposals for this year. So you can see that state revenues have definitely started to recover, but at least as far as when governor's budget proposals are released, state revenues of both fiscal 2020 which is now completed and fiscal 2021 which just completed, those revenues weren't back to the levels that states were anticipating before the pandemic began.

When we have final numbers for fiscal 21, we expect those numbers to be a little bit higher so at that time it might start to come close to what states were originally anticipating, but at least as of now revenues are still not back to pre-pandemic levels, unfortunately (phonetic).

MR. WESSEL: Brian, can you go back to that

slide for a minute? I'm noting that the footnote there. So when you do this survey, general fund revenues include federal share of Medicaid; is that right? Only Ohio changed the way they count them, so Ohio wasn't in here; am I reading the note right?

MR. SIGRITZ: No. So let me see what the -- Ohio is going to be even larger. Ohio has changed the way, at least for our reports, Ohio considers that are -- Kim, will you correct me if I get all this wrong? But Ohio included in their federal funds for Medicaid in their general funds category whereas other states don't include it in their general funds category, so Ohio has been a little bit of an outlier in how they consider Medicaid for our reports.

They always include a footnote, but overall on general fund revenues, what we're talking about --

MR. WESSEL: Good point (audio skip) general fund revenues are personal income taxes, sales taxes, corporate income taxes, gaming (phonetic), and you would kind of have that all other category --

MR. WESSEL: I got it. I just wanted to make sure I understood what was going on with Medicaid and --

MR. SIGRITZ: Yes. And then, we also have a separate report called our State Expenditure Report which I guess a lot more into detail on federal funds going to states and will be coming out a new one on that in November.

So in rainy day funds, we did see states use rainy day funds, some over the past couple of years. They didn't use them to nearly the levels what we saw during the Great Recession, though. During the Great Recession, they were really drawn down. This time we could see some declines, but we're already starting to see some states build them back up from the Great Recession until this pandemic began state revenue -- or state rainy day funds levels were at an all-time high percentage wise and actually dollar not wise, too, so they came down a little, but they're already starting to rebound, so states are once again investing in rainy day funds.

So I came to talk to you a little bit about some (inaudible) beginning, but this is what we've seen since the fiscal survey came out. One other interesting thing about what we saw, and this kind of gets into the

differences of reports as well, so since the fiscal survey on like the general funds, these slides that I was showing was showing declines in state spending or due to actions of state spending what's going on on the state spending side.

Federal funds component we saw increases in 2021 and we're going to be seeing for the next several years. When governors were proposing their budgets for fiscal 2022, most of them proposed their budgets between December and February, so that was before the American Rescue Plan was passed, so they were actually during the time when they were proposing budgets, they were anticipating declines in federal funds because most of the CARES act money was already going to be spent, and the American Rescue Plan hadn't passed yet, but then after that got passed, and now what we're starting to see as states begin to allocate an American Rescue Plan is we're not expecting to see declines in federal funds fiscal 2022 from any governor's budget (audio skip).

And also the revenue outlook has continued to improve as well, too, over the past couple of months as the economy has continued to strengthen some. The

American Rescue Plan funds are starting to flow and also some of (audio skip) various other aids programs were extended, so the state revenues that continue to rebound and we're going to see vast majority of, you know, probably around 40- or some states are going -- at least you'll see revenues exceed projection surface over 2021.

Then just talk a little bit about what we're seeing with the American Rescue Plan. You know, I think what we're seeing so far is we're seeing states begin to allocate the funding, states haven't finished allocating the funding. Some states haven't allocated any yet. You know, I think there is several reasons why it's, you know, states are, you know, haven't completed allocating the funding, one being that there is a longer time horizon with this bill than what there was with the CARES act. States have until 2024 to allocate it.

We've also seen legislature is more involved this time around than what we did with the CARES act, and also final rule from Treasury about the uses of the funds, and the guidance hasn't come out yet. They have released initial guidance, but they're accepting comments on their rule until July 16th, so like I said,

it's this Friday, and then they'll be coming out with the final rule.

You know, so I think we're starting to see states allocate some of the funding and are likely to allocate more funding as we continue through this fiscal year, and also until future fiscal years as well. This will be a multiyear process.

I think what we're to see, and Kim kind of mentioned this, too, for Ohio is a raw budget goal is that we're seeing states continue to respond to the negative impacts on the pandemic and continue to provide relief to individuals and businesses impacted by the pandemic, but at the same time we're also seeing states begin to focus on helping to rebuild the economy and to make investments in the future and to help the state grow, moving forward, so we're sort of seeing this dual purpose right now of helping businesses and individuals impacted by the downturn but also helping the economy to grow and move forward.

With that, I'll turn it back over and just quick note, all of our reports are always available for free to download on our website, and if anyone ever has

any questions feel free to reach out to myself or anyone else on the ASBO staff.

MR. WESSEL: Great. Before I just turn to the panel, Kim, there were two specific questions that came in. One was, can you tell us what's happened to total state government employment in Ohio from 19 to 20, 21 or 22, and secondly, I see you're -- it looks like you're in your office; are Ohio state employees in the office or working virtually or both?

MS. MURNIEKS: Sure. So first of on the total state employment picture, 19 to 20 kind of pre-pandemic pretty steady year. We weren't really experiencing any major growth in state employees, not really, and, you know, it had been fairly steady for multiple years. I don't have the exact numbers going back, but we didn't have any kind of major changes either way. We, as a result of the hiring freeze and kind oi the attrition, we're down about 1,500 fulltime permanent employees. We did have some areas where we staffed up with temporary workers. For example, in our state unemployment office during the really heavy months of unemployment processing, we did staff up temporary workers, but if

you look at just the permanent total staff, we were down about 1,500, but going forward --

MR. WESSEL: And that's before -- okay, roughly how many people worked for the state of Ohio?

MS. MURNIEKS: Somewhere around 50,000.

MR. WESSEL: -- including (inaudible) --

MS. MURNIEKS: Yes. Yes, roughly. So going forward I think we will assess what the future needs are. We have seen some efficiencies through remote work and kind of going paperless that I think we're all assessing what our future workforce needs are, and we may have some -- you know, end up somewhere in the middle. I don't know if we'll get back to what that pre-fiscal year 2020 staffing levels were. If you look over time, Ohio had been kind of -- and I think that's true of a lot of state governments kind of declining overall total staffing as we have become more efficient, and I think we've definitely seen some more efficiencies that we continue to take advantage of and think through what will be the long-term service needs.

So on your second qu4estion about are we remote working or in the office. We are phasing back

into offices, but many agencies are looking at hybrid work plans. My agency, as an example, we, a year ago, actually last August, when we were, you know, four or so months into the pandemic, we saw that our team, our folks who do a lot of processing and just working in the system, doing accounts payable, that type of work, were more efficient in a remote work environment, and they were actually happier as well.

So job satisfaction was up. Unplanned absences, you know, call-offs, were significantly down, and so we made the decision -- and those employees happened to largely also work in leased space at that time, so we made a decision a year ago to give up that leased space and analyze long-term remote work for that segment of our staff, and by doing that, my agency was able to save about $400,000 in leased costs each year. So as we are phasing back to offices, we're looking at hybrid for some employees, some employees will obviously have to continue to -- and in this I'm talking about state-wide, those that are direct care service --

MR. WESSEL: Sure.

MS. MURNSIEKS: -- you know, they could never

remote work, but a lot of us can, and we've found a lot of efficiencies are achievable, and a lot of long-term job satisfaction, but I will say as we have been phasing back in, I personally like the camaraderie and seeing people in the office, so that has been nice.

MS. WESSEL: Great. Thanks. So I want to let Louise and Marc weigh in here with any questions to Kim or Brian or any just reactions. Louise, you want to start.

MS. SHEINER: Yes, so I have this sort of big question that you've sort of touched on, so one of the questions that I've been doing some work in the state local sector that we have is a banded (phonetic) search the imagination that federal aid even before the American Rescue Plan was likely larger by quite a bit than the revenue losses, and yet we saw these really large declines in employment, much bigger than the midyear session, so there was this kind of puzzle.

One of the questions was, how big were the extra COVID related expenses? You mentioned some, but when I think about like relative to your revenue loss, relative to you -- have you used the whole -- your

allotment through the Coronavirus Relief Fund and all the monies that public hospitals and public education costs; so how do I think about that? And on nets (phonetic), do you just save a ton of money from having employment so much lower?

MR. WESSEL: I think that was to you, Kim.

MS. SHEINER: Yes, to you.

MS. MURNIEKS: Sure. Yes. So our Coronavirus relief dollars, our total state share if you kind of subtract out the proportion, the 45 percent that we did pass on to local government, our total was about $2.5 billion. Of that, our department of health allocation wasn't over $300 million, and then all of our other responding state agencies about $400 million, and then the other amounts, so we passed on about 300 million in economic relief, about 500 million in provider relief to again nursing homes, hospitals, et cetera, kind of the healthcare provider community, and then about 150 million to K-12 and about 300 million to our higher education institutions.

So if you look at it all totaled, the cost to state government between all of our responding agencies

in the health department, somewhere around a billion dollars of that 2.5, but the vast majority we did pass on to others, you know, whether that's schools or local governments, et cetera.

MS. SHEINER: And do you have the sense that that money that was passed on to K through 12 and hospitals that is spent already or is it sort of money that's going to be spent looking forward as they come back from COVID?

MS. MURNIEKS: So the relief payments were spent from the state treasury, and so we're not really tracking how -- you know, it was kind of straight up relief. The dollars for schools and higher education, they did have to drawn down as they had expenses. The vast majority of that, it has been paid out, but there are still some funds being drawn down.

MS. WESSEL: Brian, do you have any sense of how other states have handled the issue that Louise mentioned?

MR. SIGRITZ: Yes. No, it's a similar story for the CARES act, the Coronavirus Relief Funds that was originally states had to spend it by the end of this

past calendar year 2020, then it was extended to 2021 when we were looking at it at the end of the last year. The vast majority had already gone out the door, so, you know, most of that has been used by now, so now states are getting into looking at how you're using the American Rescue Plan funds.

You know, I think we are seeing, you know -- I mentioned this is my presentation -- a little bit of a shift in the use whereas the CARES act funds were much more aimed at using directly to respond to the pandemic and the public health emergency and now we're still seeing that, but we're also seeing for other purposes such as, you know, broadband or some of these longer-term goals as well and making needed investments that help, you know, the state and the localities well and afford (phonetic).

MS. SHEINER: Never sense -- let me just follow-up on that now.

MR. WESSEL: Sure. And then Marc, yes.

MS. SHEINER: Do you have a sense of how long -- like if we're thinking about what state and local government spending would have been over the next 2, 4,

or 5, 10 years and then the American Rescue Plan, what's the timing of when that money is actually like making a difference in the state expenditures? Do you have a sense overall, Brian?

MR. SIGRITZ: You know, I think we'll start to see the American Rescue Plan this year where it's going to carry forward for the next couple of years. What I don't think we'll see because of the longer time horizon is what we ended up seeing during the Great Recession with our Recovery Act funds where we are looking at it total state spending for states that are nationally declined until either fiscal 2011 or fiscal 2012, and that was due to our funds having winding down and the (inaudible) where at the same time state revenues are growing very slowly, so we actually during the Great Recession missed the Great Recession.

If you look at total states ending, we didn't see declines. We saw declines in the state funds, but when you cleared federal funds, we did not see a decline in them. It was a couple of years after where we did. I think this time around, we're unlikely to see that since there is a longer time horizon in state revenues

that started to recover more quickly than we saw during the Great Recession. Of course, there's, you know, uncertainties out there as far as variants and, you know, other economic uncertainties, so we can't say for sure, but, yes, I don't think we'll go (inaudible) something like that this time.

MR. WESSEL: Thanks. Marc?

MR. JOFFE: Yes, so following up on this line of inquiry, do you think that states, Ohio specifically, or any state will be able to spend all of the ARPO money within the confines of the congressional restrictions as interpreted by the treasury or do you think that some of those restrictions will have to be liberalized to make sure that the states are able to spend all the money that's being provided?

MR. SIGRITZ: Yes, I think they'll be held, too. I mean, you know, we've already seen states allocate, you know, a fair amount, and some instances as, you know, they're doing larger chunks initially, and then, you know, examining further more targeted programs. For example, we've seen several states already put it through their unemployment insurance

funds repaying those loans, so that's already been some large chunks that kind of gone out the door, and then we're seeing states build up (phonetic) committees, and, you know, doing different ways of examining where the other needs will be best met.

You know, there's some restrictions to the funds, and there is like infrastructure being one the bill specifically mentions broadband, water and sewer, but then you are able to use it for infrastructure if it's part of your revenue loss, so overall I would say the bill is fairly flexible in its allowances and the states will be able to use it.

MR. JOFFE: Thanks.

MR. WESSEL: I'll make two points just that are obvious, but just one on Table 1 is of course local governments are much bigger than state governments, so some of what we describe about the state governments applies to the local governments and some doesn't, and another thing I was just really interested, Kim, when you talked about just what a great opportunity it was for you to refinance the debt with the state of Ohio which as you say is both testimony to what the market

thinks of Ohio, but it's a reminder when the fed progresses long-term interest rates that that's an additional boost to the state governments that sometimes gets put in a different basket, but you've really helped us understand what it is.

I don't see any other questions on the sli.do thing. Louise, do you have anything else you want to ask, because if not, I want to call --

MS. SHEINER: Oh, I think we can -- I mean, I have a million questions, obviously, but that's okay. I think I'll ask one quick question.

MR. WESSEL: Okay.

MS. SHEINER: We talked about employment, so I think the story you had told, Kim, was very similar to what I've seen which is that if you look at not -- employment outside of higher education, it went down a little but not very much. It kind of was pretty flat. Higher education fell a whole ton, like, and education fell a whole bunch at local, too, but even at the state, higher education fell a whole bunch, and do you have a sense if that's really just, we don't need people, nobody's on campus, and that's all going to just come

right back up or is that a reflection of tight budgets?

MS. MURNIEKS: No, I think it probably varies from campus to campus. We in Ohio did have students back on campus in the fall, but there were still a lot of online learning as well, and so that could have, you know, led to declining needs for staff at that point in time. I don't have a sense yet of whether that will be any kind of long-term trend or change, but I think that's -- like state government I think all levels in all institutions are kind of assessing how the -- you know, what they learn during the pandemic about how staff can be more productive in different environments could lead to kind of longer-term plans.

So this disruption that we've seen I think will have cause us to do some long-term assessments and long-term planning, and I can't really predict exactly where all of that will fall out.

MR. WESSEL: Yes, interesting. I think that's true for institutions which I'm intimately familiar.

MS. MURNIEKS: How appropriate.

MR. WESSEL: Well, I want to thank you all for a really lively conversation, and just to remind people,

the conference will reconvene at 11:30 eastern time both Tuesday and Wednesday. Tuesday is going to be focused on some of the municipal bond market developments and Wednesday will be focused on funding infrastructure, and then on Wednesday afternoon as Dan and I have mentioned earlier, we're going to do a little experiment and see if we can come close to an in-person conference on virtual which is to have an open session. Zoom links are on our website; one, to discuss what's going on in the Muni Bond Market including such things as advanced refunding and build America bonds 2.0, and then the other one is going to be more like the conversation that Louise and Kim had on that. So with that, thank you all. I'll look forward to seeing people tomorrow. I'm told that we'll be muted but don't talk until you get the all-clear because you might be embarrassed on YouTube. Thanks.

MS. SHEINER: Thank you.

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