U.S. SECURITIES AND EXCHANGE COMMISSION

FIXED INCOME MARKET STRUCTURE

ADVISORY COMMITTEE MEETING

Monday, October 5, 2020

9:32 a.m.

Via WebEx Videoconference

100 F Street NE

Washington, D.C.

PARTICIPANTS:
Chairman Jay Clayton
Commissioner Hester Peirce
Commissioner Caroline Crenshaw
Commissioner Allison Lee

Michael Heaney, Committee Chairman
Dan Allen
Horace Carter
Robin Foley
Gilbert Garcia
Tom Gira
Larry Harris
Mark Kim
Scott Krohn
Ananth Madhavan
Lynn Martin
Amy McGarrity
Rick McVey
Lee Olesky
Ola Persson
Suzanne Shank
Larry Tabb
Sonali Theisen

PARTICIPANTS(CONT.):

Kumar Venkataraman
Elisse Walter
Rachel Wilson
Brad Winges

C O N T E N T S

P R O C E E D I N G S

MR. HEANEY: Good morning. Thank you for joining us for today's SEC's Fixed Income Market Structure Advisory Committee's meeting. I can confirm that we have a quorum and will call the meeting to order.

For the record, in addition to me, the following FIMSAC members are in attendance: Dan Allen, Matt Andresen, Horace Carter, Robin Foley, Gilbert Garcia, Larry Harris, Mark Kim, Scott Krohn, Ananth Madhavan, Lynn Martin, Amy McGarrity, Rick McVey, Lee Olesky, Ola Persson, Suzanne Shank, Darryl Street, Larry Tabb, Sonali Theisen, Kumar Venkataraman, Elisse Walter, Rachel Wilson and Brad Winges.

It's great to see everybody and the committee members, albeit on Webex. And while we all probably wish we were together in Washington, D.C., I'm hopeful that the next meeting will be in person. Before we begin our meeting, I want to remind all participants in today's meeting to be mindful of when your line is muted and unmuted.

Please make sure to mute your line when you're not speaking and remember to unmute your line when called upon. I'll begin by welcoming the commissioners. I understand Chairman Clayton will be joining us later this morning and will give his opening remarks then. So I'll ask that Commissioner Peirce kick things off today with her opening remarks.

COMMISSIONER PEIRCE: Thank you, Michael. And thank you to the rest of the committee for your continuing hard work. Welcome to our newest members. Although the committee is scheduled to wrap up its work in the near future, I favor extending it indefinitely. The Commission needs your expertise and insights about market events. Some of you have been serving on the committee since its inception which has entailed a large time commitment and a lot of hard work. So when I ask that the committee be extended, I understand that some of you may not be able to continue to serve.

Regardless of whether the composition of the committee remains the same as it is today, I'm confident that it will continue to be a valuable resource for us. Today's discussion, for example, will shed light on market events earlier in the year with a focus on corporate bonds, municipal securities and ETFs. As difficult as that time was, it may teach us valuable lessons about where changes are necessary and how to make the regulatory structure more robust. The draft recommendation to define electronic trading and establish reporting standards is the kind of practical

input that is particularly useful as we look at ways to support the modernization of the fixed-income markets. Thank you again, and I look forward to today's discussions.

MR. HEANEY: Thank you, Commissioner Peirce.

Commissioner Lee?

COMMISSIONER LEE: Thank you, Michael. It's a pleasure to join you today. And I agree with you about being hopeful that the next meeting will be in person. We certainly hope so. I really appreciate the time and the talent that each of you on this committee and on the panel devote to helping us work through issues related to fixed-income markets. And your agenda today is, as it always is, thoughtful and timely.

Just as we must do for equity markets, it's critical that we examine lessons learned from the recent market events caused by the pandemic. Fixed-income markets underpin finance and risk management in the U.S. economy and even globally. And some of what we've seen this year, wider credit spreads and a surging demand for liquidity created hazardous conditions that led to some fairly significant federal intervention.

So I think it's incumbent upon us to look at this from every angle and to understand whether there are policy implications that flow from that. And I'm

also really interested in the discussion surrounding the committee's recommendation on standardizing a definition for electronic trading and helping to ensure consistency in the reporting of electronic trading volume. That's important for investors and corporate communities but also for regulators in ensuring that we have accurate data for our oversight function. So thank you for bringing your attention to that issue.

In a similar vein, now for future consideration, particularly if the committee's charter is further extended, which I also support, it would be good to get your views on whether fixed-income market data might be more broadly harmonized with international standards like the uniform product identifier, uniform transaction identifier, critical data elements. These are open, cost-based data standards that are intended to allow easier aggregation of market data across asset classes and across jurisdictions to better facilitate market oversight.

And generally, I know these standards have been conceptualized as applying to over-the-counter derivatives. But, you know, if we're going to consider those standards for derivatives, it may be worth considering whether they should also apply to the financial instruments underlying those derivatives. The

financial instrument global identifier or FIGI is one example of a freely available open product identifier.

And the Commission recently sought comment on allowing the FIGI as a voluntary alternative to existing proprietary identifiers in some recent proposal. So, you know, should the committee decide to take a broader look at data standards and fixed-income markets? I submit that it may make sense to consider the use of freely-available open data standards like UPI, UPI and FIGI because they have the potential to democratize access to information and promote better risk management and oversight through allowing easier aggregation of data by market participants and regulators.

So just leave you with that thought. And also, I want to let you get to your work. Again, my sincere thanks to all of you for lending us your time and your expertise.

MR. HEANEY: Thank you, Commissioner Lee.

Commissioner Crenshaw?

COMMISSIONER CRENSHAW: Good morning. It's great to be at my first meeting. I believe I have met some of you in the past. I know some of you. And I look forward to meeting the rest of you, as you've discussed earlier this morning, hopefully in person, perhaps at the next meeting but hopefully one day soon.

I think of -- I think the work of this committee has been extremely valuable in terms of providing recommendations to the Commission on how to improve our oversight of the fixed-income markets. So thank you all for those efforts.

I understand that today the committee will consider a recommendation regarding consistent standards for the reporting of electronic trading. For regulators and investors alike, analyses yield better results when the data being analyzed is standardized and more complete. I'm interested in hearing how a more comprehensive definition of electronic trading can yield more consistent and predictable data reporting to everyone's benefit. And I share Commissioner Lee's interest in the potential role for standardized nonproprietary identifiers in making this data more accessible and usable for both regulators and the public.

I also understand that today the committee members will be sharing observations and lessons learned from the COVID-19 pandemic. I'm particularly interested in your observations of how bond ETFs responded during the time of the greatest COVID-related market volatility, the extent to which concerns about liquidity mismatch were realized and the impact on investors. I

would like to hear your views on the role of the Fed and the CARES Act in relieving the pressure and how the funds might have fared without this intervention.

It appears the consequences might have been much more severe without the Fed's decision to absorb liquidity, including on secondary market. I'm also interested in the longer-term implications of COVID-19 for the corporate bond and municipal bond markets. For example, do you have insights to share on the impact of COVID-19-related changes in consumer spending and the demand for commercial real estate or the impact of the challenges facing state and local governments?

More broadly, I look forward to hearing your thoughts on what we have learned about how we might protect these markets against future acute and unexpected shocks to the economy. Again, thank you all for your participation on this committee. Your work has yielded important insights. It seems clear that there remains important work to be done. And I also support extending the charter, as the other commissioners have mentioned. So thank you again, and I look forward to all the presentations.

MR. HEANEY: Thank you, Commissioner Crenshaw.

Next I'll turn it over to Brett Redfearn, director of the Division of Trading and Markets and the

committee's designated federal officer for his remarks.

MR. REDFEARN: Good morning. Thank you, Michael, and thank you Commissioners Peirce, Lee and Crenshaw. I would also like to welcome everybody to today's FIMSAC meeting. It's good to see so many faces. And I hope everybody is staying healthy and safe.

Let me just start by introducing my SEC colleagues who are here with us in this virtual meeting. Joining us from the Division of Trading and Markets, we have Elizabeth Baird, one of our deputy directors, and Dave Shillman and John Roeser, associate directors in the Office of Market Supervision.

We also have Rebecca Olsen, director of the Office of Municipal Securities, and Tim Husson, associate director in the Division of Investment Management. Finally, we have S.P. Kothari, SEC chief economist, and Amy Edwards, assistant director in the Division of Economic and Risk Analysis.

Before we get started, I need to remind everybody that the views expressed during the meeting by SEC staff are those of the speaker and do not necessarily reflect those of the Commission, any commissioners or any other members of the staff. I'd like to start by giving an enthusiastic thank you to all of our FIMSAC members for your continued and tremendous

efforts on this committee. I'm also happy to welcome our new committee members, Robin Foley from Fidelity Investments; Ola Persson from FINRA; and Darryl Street from the government of the District of Columbia.

While this may be their first public meeting, they have already gotten engaged in the committee through our subcommittees and we're already benefitting from their expertise. In addition to this committee's consideration today of a potential 16th recommendation to the Commission, today you all will be making several presentations concerning the impact of COVID-19 on our fixed-income markets, especially during the March/April period of extraordinary market volatility and uncertainty.

As I mentioned back in June, from my perspective as a director of the Division of Trading and Markets and the FIMSAC designated federal officer, the COVID-19 pandemic tested our fixed-income market structure in terms of price discovery, liquidity, trading volumes, clearing and settlement. So far, it seemed to have largely risen to the challenge. Some key metrics show that our fixed-income markets have significantly recovered from the peak stress conditions of March, for example, volatility of the indices, repo rates, bond ETF discounts, the NAV, bid-ask spreads and yield spreads.

Nonetheless, we are still not yet back fully to pre-pandemic levels. It's hard to imagine a more relevant time for a committee like FIMSAC to provide the Commission with its views on the performance and resiliency of our fixed-income markets. Over the three years that you've been working together, you've helped us better understand the strengths and weaknesses of our existing fixed-income market structure. And today, we'll further benefit from your views about how our markets have performed during the COVID-19 pandemic and related risks that require our focus going forward.

Our sessions today will include presentations based on data and on your personal experiences in this unique market environment. Before I wrap up, I also want to reiterate once again the importance of public engagement. We continue to encourage interested parties to submit comments on the work of the committee, including via the FIMSAC webpage on the SEC's website.

This has been a great way for FIMSAC and the Commission to gain additional insights into many of the issues under consideration. I look forward to today's discussion. And with that, I'll turn it back to you, Michael.

MR. HEANEY: Thank you, Brett. As chair of

the committee, I, too, would like to welcome our new three members, Robin Foley, Darryl Street, Ola Persson. We're glad to have you join us today. You each bring an impressive amount of expertise to the FIMSAC. And I look forward to working with you. And I'm sure I can speak on behalf of the committee, which does as well.

I just want to echo what Brett said about all the hard work and the enthusiasm and the dedication to FIMSAC, especially over the last four or five months, which has been obviously somewhat of a trying time for us all. It's been an incredible effort by the committee members to make this meeting what I'm sure will be a large success. So thank you again.

Moving to today's agenda, we do have a full day, one recommendation to consider, three panel presentations, two in the morning and one in the afternoon, followed by the FIMSAC member observations this afternoon. This morning, the Technology and e-Trading Subcommittee will present their recommendation on TRACE identification of electronic trades, which, if approved, would be the committee's 16th recommendation.

This recommendation is tied to an earlier FIMSAC recommendation, the e-trading oversight recommendation, a framework for the oversight of electronic trading platforms for corporate and municipal

bonds recommended for review by the SEC. In crafting the preliminary recommendation, the subcommittee believes that a consistent definition of electronic trading and an industry standard for reporting electronic trading volumes is a necessary component to that earlier recommendation.

The second agenda item of the morning will focus on the pandemic's impact and associated market volatility on the corporate bond market. Gilbert Garcia, chair of the Corporate Bond Transparency Subcommittee, will be leading that presentation. Following the corporate bond discussion, we'll look at the impact of the municipal securities market. Lynn Martin, chair of the Municipal Securities Transparency Subcommittee, will moderate her subcommittee's presentation.

After a lunch break, we'll start the afternoon session with a look at the performance of our bond fund and ETF markets during the pandemic. Ananth, chair of the subcommittee, will lead that discussion. We'll close the day with a -- with more general observation from the FIMSAC members.

As FIMSAC approaches the conclusion of our third year, there have been many issues raised, topics discussed and debated and a rich examination of market

structure issues facing fixed-income markets. While the committee successfully passed 15 recommendations, there may have been ideas that committee members believe are worthy for the Commission for further evaluation. This final agenda item is intended for any FIMSAC member to express what they view as significant issues for the future consideration by the Commission.

Of course, the conversation doesn't end here. As the chairman indicated at the June meeting, the committee will likely be renewed until March 2021, which gives us additional time to consider, deliberate and potentially recommend new topics on matters related to fixed-income market structure.

Finally, to manage today's discussion on this virtual platform, I want to emphasize our discussion protocol for the day. This protocol will help avoid each other -- speaking over each other and keep some order to the meeting. After each presentation today, there will be a dialogue segment where I'll open it up to members to ask questions or express views on the subject being discussed. If anyone would like to ask a question or express a view during this time period in the dialogue segment, please let me know by email. I will call on all members in the order received in the emails. Finally, I'd like to remind everyone again to please mute your line until called upon and re-mute when you're done speaking.

RECOMMENDATION REGARDING DEFINING ELECTRONIC TRADING

MR. HEANEY: With that, let's move to our first agenda item. Our first agenda item is a preliminary recommendation from the Technology and Electronic Trading Subcommittee. Rick McVey, chair of the subcommittee, will provide an executive summary of the preliminary recommendation regarding TRACE identification of electronic trades. I'll then open it to discussion to the committee.

Rick, over to you.

MR. McVEY: Good morning and thank you, Michael. This morning's recommendation from the Technology and e-Trading Subcommittee follows the SEC concept released last week that asks important questions on fixed-income electronic trading, including one of the common attributes that define fixed-income electronic trading platforms. What are the current inconsistencies in the regulatory framework for fixed-income electronic trading, and should the SEC consider amendments to Reg ATS to take into account the unique features in fixed-income electronic trading? Our recommendation should also be viewed as a follow-up to the first recommendation from our subcommittee to encourage the

SEC, FINRA and MSRB to form a working group to create one cohesive regulatory framework for fixed-income electronic trading venues to ensure resiliency in our markets, eliminate inconsistencies in the way that regulation is currently applied, and avoid the risk of redundant regulatory oversight.

Our committee believes that creating a common definition of electronic trading fixed income will allow regulators, investors, dealers and industry analysts to more accurately understand the trends and growth in electronic trading in U.S. fixed-income markets. Today's practices for reporting electronic trading volume and market share vary widely across fixed-income e-trading venues.

As a result, it is extremely difficult for any market participant to have a full and accurate picture of the electronic market share, transaction costs and liquidity available across various fixed-income trading venues. As one example of this challenge, total fixed-income volume reported by ATS-registered venues in corporate bonds has been running around 7 percent of TRACE. However, industry analysts estimate the total electronic trading in investment-grade corporate bonds is running at approximately 32 percent of TRACE.

This is because the current ATS rules were

written to address platforms that provide services commonly performed by registered stock exchanges and did not contemplate different fixed-income protocols such as electronic request for quote or RFQ. Additional inconsistencies arise in electronic trade volume reporting due to whether the trade was directed to a single dealer or multiple dealers reporting for trades that are matched principal trades conducted in an all-to-all trading environment versus disclosed client-to-dealer trades and trades where a registered ATS may give up the trade to a different broker-dealer for trade settlement often resulting in double reporting to TRACE.

Furthermore, there is a common practice in the fixed-income industry today where some market participants trade off-venue through traditional means by phone or instant message and then report the post-trade message on venue in order to achieve straight-through processing. Some fixed-income platforms include these process trades in their volume and market share reports while others do not.

Given the wide differences in reporting standards today, it is difficult at best to conduct direct comparisons on market share and liquidity available on various platforms and to get a true sense

of the market share trends in total for fixed-income electronic trading.

Our recommendation, as a result, is for the SEC to clearly define electronic trading so that any new regulation or framework comprehensively covers the platforms and trading functionality that the SEC intends to cover without reliance on the current ATS definition; take the above-discussed factors into account when defining electronic trading, including single dealer versus multi-party execution and fully electronic versus post-trade processing; and establish industry standards for electronic trade reporting that address the current inconsistencies described above relating to ATS functionality, single-counting versus double-counting and the treatment of give-up trades for settlements. With this change, we believe all market participants, including regulators, will have a consistent and accurate picture of electronic trading trends across U.S. fixed-income markets.

And Michael, that concludes my remarks and summary on the recommendation. I will turn it back over to you.

MR. HEANEY: Thank you, Rick. I'll now turn it over to members for questions or comments and perspectives on the recommendation.

MR. REDFEARN: Looks like Sonali wants to jump in.

MR. HEANEY: Can you hear me? Sonali, please.

MS. THEISEN: Thanks very much. You know, I'd just like to say that I've seen a lot of thought went into this proposal. And thanks very much to Rick for putting all of the work and effort into pulling this together.

I think that as a headline matter, you know, this has come up with FIMSAC for a few times now since the start of our charter. And I think that it's just a fairly fundamental need for the market to have some type of consistency. It's very foundational that there be some type of consistency in how we think about electronic trades so they can be measured. I think there is a lot of public interest in this topic, whether it be by market participants, you know, the regulators, researchers, etc.

And I think that, you know, this is one of the pieces that -- certainly that like there is some regulatory complexity to solving. But it's quite foundational for the market and certainly a question that we receive in our -- constantly, you know, what does e-trading mean. Where can I see those numbers? How should I compare them? It is the questions that we

get every day by -- from investors.

MR. HEANEY: Thank you, Sonali.

Larry Tabb?

MR. TABB: Thanks, Michael. I want to also thank Rick for running this. I think he did a great job. And I totally agree as an industry analyst that we need a better way how to categorize electronic trades, especially with the tremendous complexity and how all of the trading kind of fits together.

The one thing I'm a little concerned about is the overarching view to kind of regulate everyone. We just need to be careful that we don't wrap in messaging platforms that have no relationship to providing capital or -- you know, or matching buyers and sellers together because that could then rope in fixed platforms or fixed servers because, you know, if both sides are regulated -- and, you know, we just need to be careful who we -- who gets roped into those regulations. And that's my major concern.

But anybody who matches two buyers and sellers together I fully agree should be regulated. Anybody -- any mechanism that kind of functions in the center of accepting risk or managing those transactions should be regulated. On the other hand, if it's just me sending a message to a dealer through a messaging platform, I

don't see, you know, how it benefits us to kind of start regulating fixed servers or fixed-messaging platforms in this process. And with that, I'll say thank you again.

MR. HEANEY: Thank you, Larry.

Other comments, questions?

Let me turn it over to Brett or the commissioners. Any questions or comments for Rick or the subcommittee?

MR. REDFEARN: No. I mean, this is a great discussion. Thank you for the recommendation. You keep coming with them. And we talked about some of these things before. So we appreciate the discussion. I will seek to see if any of the commissioners have comments or questions.

MR. HEANEY: Thank you, Brett.

Okay. If there is no other comments or questions, I will entertain a motion to vote on the recommendation. If I could get somebody to move it, please --

PARTICIPANT: So moved.

MR. HEANEY: Thank you.

PARTICIPANT: Second, Michael.

MR. HEANEY: Thank you. I might do what we did in the last meeting as well, just so everyone is familiar. I'll do a roll call for the vote. So if you

would be prepared to unmute as we go alphabetically --

Dan Allen?

MR. ALLEN: Approve.

MR. HEANEY: Matt Andresen?

MR. ANDRESEN: Approve.

MR. HEANEY: Thank you.

Horace Carter?

MR. CARTER: Approve.

MR. HEANEY: Thank you.

Robin Foley?

MS. FOLEY: Approve.

MR. HEANEY: Thank you.

Gilbert Garcia?

MR. GARCIA: Approve.

MR. HEANEY: Thank you.

Larry Harris?

MR. HARRIS: Approve.

MR. HEANEY: Thank you.

Scott Krohn?

MR. KROHN: Approve.

MR. HEANEY: Thank you.

Ananth Madhavan?

MR. MADHAVAN: Approve.

MR. HEANEY: Thank you.

Lynn Martin?

MS. MARTIN: Approve.
MR. HEANEY: Thank you.
Amy McGarrity?
MS. MCGARRITY: Approve.
MR. HEANEY: Thank you.
Rick McVey?
MR. McVEY: Approve.
MR. HEANEY: Thank you.
Lee Olesky?
MR. OLESKY: Approve.
MR. HEANEY: Thank you.
Suzanne Shank?
MS. SHANK: Approve.
MR. HEANEY: Thank you.
Darryl Street? Perhaps unmute. I'll just -- Darryl Street?
PARTICIPANT: You're on mute, Darryl.
MR. STREET: Sorry. I was trying to use my phone for that. Approve.
MR. HEANEY: Thank you.
Larry Tabb?
MR. TABB: Abstain.
MR. HEANEY: Okay. Sonali Theisen.
MS. THEISEN: Approve.
MR. HEANEY: Thank you.

Kumar Venkataraman?
MR. VENKATARAMAN: Approve.
MR. HEANEY: Thank you.
Elisse Walter?
MS. WALTER: Approve.
MR. HEANEY: Thank you.
Rachel Wilson?
MS. WILSON: Approve.
MR. HEANEY: Thank you.
Brad Winges?
MR. WINGES: Approve.
MR. HEANEY: Thank you.
And my vote is yes. We do have the needed -- in excess of 11 votes in favor of the recommendation, which will be passed and approved by the committee.
Rick, thank you again for all your hard work as subcommittee chairperson and the entire subcommittee for the hard work on this. Very much appreciated.

CORPORATE BOND MARKET OBSERVATIONS AND LESSONS LEARNED

MR. HEANEY: Okay. Let's move along. Next on the agenda we have the member observations of the pandemic impact on the associated market volatility on the corporate bond market. Gilbert Garcia, chair of the Corporate Bond Transparency Subcommittee, will lead the discussion.

Gilbert, I'll turn it over to you.
MR. GARCIA: All right. Let's go. So Chairman Clayton, commissioners and my fellow FIMSAC committee members, ladies and gentlemen, I'm Gilbert Garcia. And this, again, is the Corporate Bond Transparency Subcommittee.
This has been a team effort from the beginning. So we're going to have essentially many of our speakers presenting as part of this presentation. But I could assure you we're going to be fast. We're going to be smooth. And we're going to be on time. I'm going to serve as your host, your timekeeper and your slide conductor. So I'm now going to go ahead and start sharing the slides.
Okay. Very good. So what you're going to see today is that while COVID caused significant volatility, overall, our conclusion, markets worked. And they worked very well. And unlike Lehman Brothers where the primary focus seemed to be monetary policy, during COVID, not only did we have significant monetary stimulus, but we had unprecedented fiscal stimulus.
If you look at this first slide, this is just a slide of the Federal Reserve balance sheet. And you can see on the X-axis time from '03 to 2020 and on the Y-axis, the size of the balance sheet in millions. And

you'll notice that right before Lehman Brothers in that '03 to '08 time period, the balance sheet was about a trillion dollars. And then we had several different quantitative easing programs where the Fed bought securities. And we topped out right around four-and-a-half trillion.
And then you'll notice we started to have some runoff in 2018 and '19. And then came COVID. And during COVID now, we are already over $7 trillion in a place that we haven't seen before. And one of the results, of course, has been an unprecedented growth in money supply. And for those of us who don't recall the quantitative theory of money, you can see it there in the center. Well, of course money times velocity equals price changes times economic growth.
And you can see on the X-axis time from 1948 to the present. And you can see the year-over-year percentage growth on the Y-axis. I won't go through all the different stress points in the '70s and certainly in modern times with Lehman Brothers and Greece. But the one thing to see is even during those stress points, the growth rate of money supplied year-over-year was approximately 12 percent. And during COVID, we've been at unprecedented levels, at almost 25 percent and frankly -- and still counting. And so what you're going

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to see here in our presentation is, despite some of this incredible fiscal policy and monetary policy, we also had commercial paper back-stop programs and bond-purchasing programs.

And while they were hardly used, their mere existence went a long way to stabilize markets. So where the dealer community might have had challenges during the COVID crisis, a new hero has really emerged to take up a lot of the slack. And that is electronic trading. And you're going to see that during the following presentations and slides as we go forward. I'm now going to turn over to my colleague, Kumar, who is going to begin here.

And we're ready, Kumar.

MR. VENKATARAMAN: Thank you. Thank you, Gilbert.

In the next few slides, I'll move our conversation from a very macro perspective that Gilbert provided to a micro perspective of the BBB market during the challenging events of 2020. One area of exploration of the Credit Rating Subcommittee, which is chaired by Amy McGarrity, on which I serve, was the conflicts of interest and the issuer pay model which might lead to inflation of current ratings. The incentives to receive a higher rating were particularly high for issuers that

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fall on the threshold of investment grade and high-yield rating. That is the vehicle issuers in the BBB category. And this segment of the market has received particular attention from FIMSAC.

In the midst of high economic uncertainty and a sharp decline in economic activity, as might be expected, we saw an unusually high number of downgraded debt with BBB rating, 329 billion in the first six months of 2020, according to an S&P-founded global ratings report. And this is forecasted to be 640 billion by the end of the year.

Another statistic, over the 12 months ending June 2020, the percentage of BBB non-financial debt that has been downgraded is 4.5 percent, while the comparable statistic in June of 2019 is 1.3 percent. So these patterns point to a heightened stress in this segment of the market.

Next slide, Gilbert. Thank you.

However, by other metrics, the BBB market has fared really well. In February and early March on the onset of the crisis, the BBB nonfinancial bond issuance activity experienced a sharp decline. During this period, a large amount of revolving credit facilities were either partially or fully drawn in anticipation of credit markets potentially freezing up and Scott has

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kindly offered to say more about this during his presentation.

But as can be seen from the chart, these stress conditions improved remarkably during the second quarter of 2020 and continued into the third quarter, as was observed from a report that came out just recently this week. The BBB non-financial bond issuances set a new record, more than doubling the issuances observed before the onset of the pandemic, as seen in this chart.

Next slide, Gilbert. Thank you.

The chart on the left here shows that the investment grade and high-yield composite indexes, as well as the S&P-founded index saw steep declines in the two weeks before March 23rd, coinciding with the Fed announcement of the 2.3 billion in -- trillion in liquidity facilities. These declines were sharply reversed.

And the chart on the right shows that the Fed announcement coincided with a sharp reduction in BBB spread from about 400 basis points to 225 basis points and also offered a significant boost to the BBB bond issuance activity. So what all these patterns suggest, that the unprecedented Fed interventions had calmed the market. With that, I will turn over to Sonali, who will share the overall market trends and perspectives in the

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new issuance market. Thank you.

MS. THEISEN: Thanks so much, Kumar. And thank you so much to the chairman and Commission as well as myself and staff members for the opportunity to provide observations today. I think as a headline matter before I begin, I think what we've learned through the pandemic and for capital markets is that in 2020 -- is that, you know, situations are fluid and can escalate quickly but that, you know, adaptability, quick response and collaboration from public and private sector have made for the best outcome.

So as the pandemic unfolded and this exogenous shock reverberated, you know, through the funding markets and into secondary trading, you know, there is a number of observations that I'd like to make and go into some data. So on slide 2, as you can see, you know, initially the capital markets seized across the board as the pandemic unfolded in the U.S. The U.S. IG market saw zero issuance the first week of March. And the high-yield market was effectively shut for several weeks.

Bear in mind that this was at the height of this terrible news cycle and a period of, you know, complete global uncertainty that was leading to a sharp selloff in credit and some balance sheet, you know, challenges for the market. However, once, you know, the Fed intervened in March, the markets opened up, I'd say, constructively and logically, starting with, you know, higher quality and moving into BBBs and then into high-yield. And you can kind of see this, you know, in the charts that, you know, the IG market issuance rose, you know, and then led into sort of a -- right to the high-yield market.

You know, once the markets reopened and credit spread began their massive rally, I'd say that we've seen sort of two ways of issuance. The first was in March through May. And that was, again, really borrowing in the face of uncertainty. And so it started with, you know, higher-quality ratings, moving into BBBs and then into high-yield in April and June.

And you can see then the markets took a bit of a -- bit of a bleeder at least in July and then followed by now the August/September wave, which I've categorized more, you know, proactive issuance reacting to tighter spreads where, you know, IG issuers we've seen have mostly been repaying debt and churning out their commercial paper. I would also, you know, note on the side that, you know, quite phenomenal that the IG markets experienced seven of their ten busiest weeks, you know, in history of issuance between March and May.

And as I move to slide 3, you can see that the supply has been extremely well-absorbed. Investors have continued to add risk, you know, post-stimulus, which has led to a massive spread tightening. And this has really led to, you know, great pricing dynamics for issuers in deal pricing and in order book description.

And this, of course, you know, has really not only the primary markets but, you know, price action in the secondary markets, which, you know, move to price to where the primary market clears. You know, 20 of the lowest new-issue coupon has been achieved during this tightening. And I'd say that what generally feels different in this cycle versus, you know, the '08/'09 crisis is that investors quickly pivoted to a what can I buy mode versus, you know, I want my money back, particularly with, you know, risk -- rates approaching -- approaching zero.

As I move to slide 4, you know, as I mentioned previously, the liquidity crunch, you know, impacted the CP market. And this was arguably the first time that, you know, we've really seen a disruption in the CP market, as there -- as there was access during '08 and '09. Across the CP and short-end bonds, you know, the front end is really what shut down in early March. And since then, we've seen CP balances come down fairly

dramatically.

So year-to-date, if you look at the high versus where we are now, we're down about 39 percent of CP outstanding. And so now given that issuers -- refinance out the curve, this may be a structural shift for a while for the CP markets. So I'm going to stop here for a moment to turn this presentation over to Scott. Thank you.

MR. KROHN: Thanks, Sonali.

From an issuer's perspective, you know, as we sit here today with issuers breaking records in terms of the debt issued, it's easy to forget how stark the crisis was in March. And, you know, I think part of the mission of this Commission and advisory committee has been how can we shore up markets for that next crisis. And I think we've seen it in the March-to-April time frame.

And from our perspective at Verizon and the caveat here is that this particular crisis was extremely punitive in terms of companies that investors thought were going to be okay and those that weren't going to be okay. So Verizon with connectivity, whether it's wireless or Fios on the East Coast with broadband was obviously a stay-at-home, school-at-home, work-from-home beneficiary. So you can take these comments from me as

a little bit of a caveat because we were relatively better off.

But nonetheless, as Sonali pointed out, we saw the closure of the high-yield market. We saw the disruption of the CP markets. We activated our emergency liquidity planning playbook at the end of February. And, you know, our choice was do we go to the market and just test it, or, you know, do we draw on our revolver. And I think, as Sonali pointed out, there was a record draw on bank revolvers as part of this crisis.

And what we actually were looking for is a -- given the taint associated with drawing on revolvers was a -- just a standalone, short-term credit facility. And as a sign of how the banks were in a much different position this time versus last time, the banks just said, "No. We prefer you drawing your revolver. We're so busy helping other clients." And again, maybe this is more Verizon but they incurred -- just drawing revolver. And we decided not to do that because we still think there is a taint associated with that.

So we tapped the markets on March 17th. And, you know, again, this crisis on March 17th felt as bad as the Lehman crisis, although in the back of our mind, I think we all thought that with a vaccine sometime on the horizon, whether that's one or two years, at least there was a likely definitive end to this crisis versus Lehman.

And when we went to market -- and Amy will be interested in this. You know, during times of crisis, credit ratings are merely a reference. The market does its own analysis. So we went to market at the same time as a AAA oil and gas company as well as a single-A delivery company, which was also a stay-at-home beneficiary. And our spreads were better than both as a BBB-plus. So again, crises tend to be a good time to look at ratings in terms of being reference points, not necessarily determinative of issuance costs.

You know, again, I think this is referenced. The Fed came in and turned this market from a crisis into an issuing opportunity, not only re-implementing all the programs that they had in '08/'09 but doing many more in addition to cutting rates to zero. So even with our crisis offering on March 17th, we issued at 3 percent for a 10-year, which was 50 basis points -- only 50 basis points higher than our all-time low for a 10-year issuance. So what we told our board of directors is this is pretty cheap insurance in a time -- in a crisis. And as a reference, we also issued in October of 2008 that 3 percent compares to 8.6 percent in '08. So, you know, I think what companies are doing

now as this market has pivoted with the pistol stimulus that has accompanied the Fed stimulus, you would never think that it would be true that Verizon, you know, in March and April had all-time highs in customers being current. And that's with 40 million unemployment claims.

And so that speaks to the unprecedented pistol stimulus that accompanied the Fed stimulus. You know, work unemployment claims on average went from $300 a week to a thousand dollars a week. And at the same time, $1200 stimulus checks were sent. So the consumer stress is almost completely absent. And I think that's why we've now seen this market turnaround.

From an issuance perspective, what issuers are doing now is hoarding cash still because of a potential phase two of the virus. And they're doing liability management to clear out near-term maturities as well as take advantage of NPV-driven long-dated exchanges, given we never seen interest rates this low and all issuers are breaking records in terms of coupons and new issuances. Thanks. Over.

MS. THEISEN: Great. Thanks so much, Gilbert.

So now moving on to secondary markets and trade volumes on slide 5. So I'm going to share some observations on overall activity. And I certainly want

to thank our committee member, Ola Persson, at FINRA for sharing this data to provide here.

So on slide 5, as you can see, both IG and high-yield volumes in March through June of 2020 were significantly higher than the period average overall and then, you know, certainly since the same period the year before. So if we compare March through May of 2020 with prior year, IG total secondary volumes were up about 28 percent. And for that same period, if you look at just the turquoise part of the stats bar, new-issue trades, so trades of bonds issued within the last 30 days, were actually up 179 percent.

So to Scott's point again, you know, it's a phenomenal amount of issuance. And that really -- the primary market, you know, led to growth in secondary market volume quite substantially. For high-yield for that same period and that same year-over-year comparison of March through May of this year versus last, total high-yield volumes were up 54 percent. And again, that turquoise part of the bar, you know, new-issue component of that was -- the new-issue component was up 106 percent.

So, you know, markets certainly remained very active during the volatility. You know, they continued to trade. And I would note that, you know, I think

high-yield overall volume increases outpaced IG given there was downgrades of some pretty significant, pretty large structures. I'd also note that, you know, particularly in March, you know, the front end of IG secondary trading paused significantly. And so there was a volume drain there that was still significant risk transfer out to -- I'll switch now to slide 6.

So headline observation, you know, pivoting from looking at volumes to now, you know, this number of tickets that go through the market -- and my headline observation here is that risk transfer continued through the volatility in institutional -- in the IG market, the top half, the most significant growth was in ticket counts, was in the sub-5 million tickets, the turquoise bars again, during, again, that March through May period year over year.

That was up about 25 percent in terms of ticket count. And in high yields, the most significant growth was above what the current block size is of 1 million, which is up 48 percent, again, March, May, year over year over prior. And one note that I've made here is I think, you know, I'm highlighting these changing dynamics in the market, is another reason for us to consider and reconsider recalibration of trades to have a higher, you know, block ratio for high yield relative to IG. I'll switch now to slide 7. So pivoting now to spread movement and market-making in slide 7 and 8, not surprisingly, you know, the quoted bid offers in both IG and high-yield moved out, you know, dramatically as absolute spreads widened. And they've then come back in now with the aggressive rally since late March.

We've chosen to show quoted bid offers here instead of executed bid offers because we think that gives the best sense for, you know, the pricing of immediate liquidity. You could also look at, you know, executed bid offer. That also gives you some interesting information -- but you'd have to bear in mind that that contained, you know, order flow as well as, you know, some things that we had discussed in previous recommendations around embedded transaction costs, timing, etc.

So looking at the constituents of the LQD, the corporate bond constituents of LQD and HYG ETF as proxy, I'd note that, you know, IG bonds moved from just under four basis points to almost 17 basis points of quoted bid offer and are now at about six basis points, five to six basis points quoted bid offer. And in comparison, you know, the high-yield bonds moved from about under, you know, .4 -- price points to 1.4 points and are now, again, you know, just under .6 points. So these trends

of, you know, normalization have continued very slowly, as you can see from the chart, since June. But we continue to, you know, move towards normalization of quoted bid offers.

Slide 8, Gilbert. Thank you.

So with respect to the relationship of spread across the credit spectrum, I've included an interesting dispersion chart from our strategist, Tom Mickelson. Both of these scatterplots chart the absolute BBB spreads on the X-axis, and the Y-axis is the basis between BBB and single-A and BB and BBB spreads respectively.

So as you can see on both charts, the dispersion or the difference in the higher rating and -- versus lower rating, as represented on the Y-axis -- actually lower than the fitted curve on March 23rd, signaling that, actually, higher rated bonds underperformed right at that time as investors sold, you know, higher-quality paper during liquidity concerns. And then for context, it included on the chart, you know, March 6th and September 18th data as well, also in red, to show that the relationship, you know, prior and since has corrected. And then moving to slide 9, so throughout, you know, our comments in the back, we've highlighted, you know, March 23rd as, you know, an

inflection point with the Fed's actions.

And by all accounts, you know, the data confirms and, I think, you know, anecdotally all our comments thus far have confirmed that, you know, the Fed's announcement and certainly the secondary market credit facility and the primary facility were certainly catalysts for market stabilization by providing a clear backstop. The PM ETF has not been used to date. And I would note that, you know, SM -- purchases began with credit ETF purchases as the details of cash bond purchases were being fine-tuned.

And as you can see on the slide, you know, the overall purchases have been relatively light relative to the size of the facility and the market outstanding. But nonetheless, we think -- have an important impact on the market. We think particularly that the ETF purchases initially were meaningful into the market in two ways. One, you know, the purchases implicitly impacted the entire curve, not just the under five-year issuance, which is where, you know, corporate bond purchases were focused.

And second, the impact of the purchases were more directly observable to the market in the form of premium-end discounts and NAV values which we think were a constructive signal of strength. For context, you

know, the LQD premium discounts in NAV swung 10 percent in under a week. So it went from, you know, 5 percent discount, roughly, around March '19 to a 5 percent premium around March 25th.

So moving on to slide 10, you know, I would like to, you know, address some of the comments and questions around dealer market-making and capital constraints. First and foremost, I would highlight that, you know, as a bank, as a broker-dealer, we were there for our clients through the volatility. And since we had robust capital and liquidity position coming into the pandemic which we've continued to build on, however -- you know, for the marketplace, given the extreme dislocations in pricing, it is fair to say that banks found themselves in situations where while they were focusing on facilitating customer needs, they were also trying to adhere to somewhat inflexible risk and regulatory frameworks. And that led to some distributional frictions of a balance sheet.

So there is a number of indicators that could be studied. But as a simple measure, I've included the aggregate GSIB bank VAR and RWA over time. So you can see these risk and capital metrics moved higher quarter-over-quarter for quarter ending March 31st and then again moved meaningfully higher as of June 30 --

June 30th.

So banks, you know, clearly needed to manage through some challenging circumstances with this accelerating VAR and RWA consumption. So, you know, what happened, you know, in the nutshell? Market, you know, risk, capital-driven -- market risk-driven capital metrics, of course, skyrocketed on the back of volatility, which was more severe than previous cycles and therefore drove a recalibration of VAR and stress VAR.

In addition to VAR, you know, credit rating migration impacted RWAs and therefore, you know, capital ratings. Some banks saw, you know, the increases in RWA as credit migration pushed down ratings. This is really a simplified version of the story. It has other factors which are -- others are probably more qualified to tell the story. But I'd make two other headline observations. You know, the first is, you know, GSIB banks generally maintain -- banks generally maintain significant capital buffers over the regulatory minimum. As these buffers are not really viewed as something that is -- they are to be used.

The second observation would be that it was fortunate that GSIB scores were not a factor in the Q1/Q2 turmoil and that dealer balance sheets didn't

really suffer from any GSIB behavioral constraints. So in a sense, you know, the timing of what occurred was lucky versus, let's say, you know, the end of this year, particularly with the upcoming election.

So finally, in conclusion, you know, I'd like to note that the market successfully weathered tremendous volatility during unprecedented extenuating challenges. Obviously, you know, in New York City, across the world, in addition to, you know, individuals and companies grappling with mushrooming healthcare crisis, you know, grappling with business contingency plans, with liquidity concerns all while, you know, trying to figure out how to have their children attend school on Zoom, you know, for the first time.

So I'd like to acknowledge the strong leadership from market regulators in quickly acknowledging the severity of the situation and taking decisive action. You know, the regulators stepped in to provide appropriate relief in areas such as reporting and record-keeping. This flexibility allowed for the transition quickly to work from home while, you know, the regulators, you know, simultaneously committed to supporting the markets and staying open. So, you know, I think it was really important to highlight that. This was, you know, a great, collaborative effect. It was

equally, I think, commendable that market participants adapted quickly with little, if any, disruption. But, you know, many financial institutions are included for the first time in history, witness the majority of front-office personnel working from home. And as Rick and Lee will surely highlight, electronic markets were also really put to the test and passed, in my view.

You know, the fact that there was no noteworthy outages or issues for the electronic bond markets despite record updates, record transactions, settlements, that was an excellent outcome for the overall market ecosystem, good news in that department, as I would say. So I would like to conclude my comments where I started regarding the lessons learned, which is, you know, the proven resiliency of the markets, of the public and private institutions and the people who make those markets have been, I think, a clear silver lining from the pandemic. Thank you.

MR. GARCIA: Thank you, Sonali.

And thank you, Scott and Kumar.

We're now going to move on. So far, we've talked about some macroeconomic factors. We've talked about downgrades. We've talked about the primary/secondary market, including from an issuer's perspective. Now we're going to go to electronic

trading.

Rick?

MR. McVEY: Thanks, Gilbert. I'd also like to thank Sonali and Scott and Kumar for their comments as well. And Lee and I are now going to do our best to tell the story of the electronic trading markets in corporate bonds through the credit event in the spring. And I would like to just start with a couple of overall comments on the market to follow Sonali's remarks.

This was a credit event that, in many ways, was far more severe than what we went through in 2008. And to put that in perspective, credit markets had never anticipated an event that would impact every sector of the economy and every region of the -- in the world at the same time. And as a result, what we saw in credit spread widening in both high-grade and high-yield this year, we had more widening of spreads between the end of February and the end of March in four weeks this year than we had in eight months in 2008.

So this was a very significant shock to the market. And I think there are some good stories around the performance and importance of electronic trading venues through the event. And I'd just like to follow on Sonali's comments to talk a little bit about that from the MarketAxess perspective. Most of our bank and dealer clients and investors relied on disaster recovery sites for events like this and did not have everyone set up in a way that would allow them to trade from home environments. With the regulatory relief that was provided that Sonali mentioned, we moved, at MarketAxess, 10,000 users in one week to their work-from-home environment and provided the security certificates that they needed to do so safely. And I'm sure you're going to hear very similar comments from Lee on that as well.

So maintaining connectivity to critical liquidity providers, banks, dealers and alternative market makers through electronic venues, in my opinion, was fundamental and important to the success of working through the credit event that took place in the spring. So this first slide is just a slightly different picture on what Scott and Sonali were talking about in terms of the substantial new-issue activity in the market. So I don't want to dwell on it for long. But the green line shows the turnover in the top 1,000 CUSIPs reported to TRACE on a rolling 12-month basis.

And what you'll see there is with the substantial and record-setting new issue calendar beginning with high-grade and followed by high-yield. The top issues really drove the increase in TRACE

volume. So you see the top 1,000 CUSIPs with a significant increase in turnover. And many of those were the newly-issued bonds that Sonali mentioned. If you look at the lower line, that is actually mostly seasoned bonds that have been in the market for longer than four weeks. And turnover has been up a little bit but generally flat during the course of this year. So most of the increase in TRACE was really connected to the significant increase in new-issue volume.

And Gilbert, let's go to the next slide.

The next two slides, I'm not going to really spend any time on. But this is the complementary picture on bid-ask to what Sonali described as quoted bid-ask. This is traded bid-ask. So we run a -- what we call a BASI index, a bid-ask spread index, based on the observable bid-ask from the TRACE data primarily.

And you'll see the bid-ask, because of the extreme amount of risk and volatility in the credit markets, did go up for a period of time as much as ninefold. It started to recover after the Fed programs were announced in late March. We're not quite back to where we were pre-credit event, but we work our way pretty close back to where we were. And the following slide, Gilbert, shows a very similar picture in high-yield, obviously a lot of stress in high-yield markets

throughout the event. Bid-offer went up about threefold in high-yield. Many bonds were not able to trade at all. But for the observable bonds that did trade in TRACE bid-offer there was up about threefold.

And Gilbert, let's go to the next slide.

So this is courtesy of Greenwich Associates. And they are one of the research firms that really does their best to put the full picture of electronic trading together for their clients in high-grade and high-yield. So they are doing that through a series of conversations with all electronic trading venues to try to understand what they are including in their reported trading volumes and do their best to get it on an apples-to-apples comparison. And you will see that the total market share in what they reported electronically traded in high-grade did dip a little bit in March and April but recovered pretty quickly.

But a couple of things on that. We conduct mostly RFQ volume on the MarketAxess platform. And our share in March and April was actually higher. And we typically represent somewhere around two-thirds of the overall market activity that Greenwich Associates is reporting. And I just want to put a word in for RFQ. It's -- I think Sonali and other market-making firms would agree RFQ has proven to be a competitive,

resilient and sustainable protocol for fixed-income securities. And when you're dealing in a market like corporate bonds that are highly fragmented with less frequent trading throughout the day, RFQ allows the price provider or market maker to be at risk at the point of execution. And throughout the extreme volatility, the RFQ electronic volume in the market actually went up. And the share went up as well.

The protocols that were challenged are the ones that require live streaming prices or have extended matching sessions where market makers and others are at risk for longer periods of time and often on a continuous basis. Those protocols proved to be very challenging through the credit event because of the extreme volatility. So the share did dip a bit initially.

But by May, we were back to where we had been. And it's interesting to note with the success of the electronic trading venues and the convenience of trading from home electronically, the share in both corporate bonds and high-yield estimated by Greenwich Associates has reached new highs over the last three or four months.

And Gilbert, let's go on to the next slide.

So just a quick comment first on resiliency.

And Lee will have similar comments, I'm sure, from his perspective. But it's not to take -- be taken lightly. Our message traffic on MarketAxess from late February through early April on many days was up threefold from what it was in January and February. And there were many days in that period where our trade count was double.

So there was a significant amount of increased activity coming through the electronic trading platforms. And I, too, would agree with Sonali. It was a good result that all of the e-trading venues in fixed income proved to be resilient and, I think, provided a valuable service through the credit event for market participants.

Most of our orders on MarketAxess are now available all to all. So investors or dealers that submit orders into the MarketAxess system have the choice of making them available to the entire network. And almost always, they take that option. What's interesting is if you look at January and February. The percentage of trades that landed with a non-traditional market maker on our platform jumped from 28 or 29 percent of our trades -- trade volume to about -- at the peak to around 37 percent. And it settled in around 35 percent. This, too, is very different from 2008. If

you look back at 2008, not only was e-trading at a totally different level. It was almost entirely traditional client-to-dealer trading.

With the increase in all-to-all offerings in fixed income, the venues have allowed new market participants to enter credit trading and commit capital to this market where they have not been able to in the past. So what -- there are three forms of new liquidity that have resulted for investors and dealers that are placing orders on the e-trading venues.

First, significant new alternative market makers have emerged, many of them active in ETFR that have now moved on to become full-blown market makers. Second, investors have an easier time sharing their order with more dealers, not only in the U.S. but outside the U.S. Dealers are incented to make markets because of the availability of order flow. And third, investors are able to respond to other invested orders as well.

So the pool of liquidity now available on many electronic trading venues is significantly more diverse than where we were in 2008. And I think that was a critical source of additional liquidity for the credit -- through the credit event in the spring. And you can see that that additional liquidity was responsible for

over a third of the volume traded on the -- access system during the credit event.

Gilbert, let's turn to the next slide.

The other piece that's valuable to the industry is that when the markets are stressed as they were in late February through certainly mid-April and bid-offer is so wide, the value of finding an electronic natural match goes up substantially. And so what investors and dealers have been able to do electronically is find the natural matches in the market that reduce the need to cross significant bid-ask spreads in times of credit stress in the system.

And you will see that liquidity taker savings went up about threefold based on our estimates in March on the MarketAxess system. And liquidity providers also achieved greater savings. So I think the transaction cost savings that go through the market where we had around 130 million in estimated savings back to our clients during the month of March alone are another important part of the importance of all-to-all trading and the growth of it in fixed-income markets.

So, Gilbert, let's go to the next one.

And then finally, I know Ananth is going to speak extensively about this. But the other stark change in my mind about where we are this year relative

to where we were in '08 and '09 is the substantial growth of ETF assets. And with the growth of ETF assets, we've also seen a significant growth in ETF share trading.

It was uncommon three or four years ago to find many traditional dealers that had ETF fixed-income share trading on their corporate bond desk. It was also uncommon to find many institutional investors that were using ETF shares as a risk transfer mechanism. It is exactly the opposite today.

Most every significant market-making firm is actively using ETF shares as part of their risk management and risk transfer mechanism. And the same can be said of institutional investors. In my mind, this was also a complementary source of liquidity for credit markets during the credit event that was incredibly valuable to help the markets function. And the end result was that TRACE volumes did go up through this credit event and actually quite substantially. So while bid-ask and transaction costs were higher, trades were getting done, and volumes were up substantially. And I do think it's all part of the new ecosystem that we have for credit trading.

And with that, Gilbert, I am finished with my comments. And I think you can turn it over to Lee.

MR. GARCIA: Thank you, Rick.

Lee, it's all you.

MR. OLESKY: Thanks. Hey, Gilbert, I just want to say a word of thanks to you for spending the time with all of us over the last week or so pulling this together. Not an easy task. And thanks to the rest of the committee members. I'll try not to go over things that we've hit on already.

I want to continue with the story that Rick started in terms of what's been happening with e-trading because I think, you know, obviously the pandemic impacted so many lives and businesses almost overnight. By mid-March, at TradeWeb, we have about a thousand employees. We went home, all thousand people, within a day or two. And probably, most importantly, so did tens of thousands of other clients of ours that were able to connect with the networks that are available today from their home. That is just not something that could have happened years ago.

You know, this connection, the systems worked incredibly well. It allowed our clients to find the other side of the trade to interact and probably, even more importantly, tap into data to be able to see what was happening in the market. If you remove us as individuals from our in-person environment, especially

on a trading desk or in an organization, a financial institution, the first thing you're going to miss is that interaction and the ability to assess what's happening in markets. And the evolution of e-trading has allowed for so much more data to be available real-time to people's laptop at home. And I think that that was a huge factor.

We'd obviously already been seeing a surge of growth in electronic trading over the years with digitization of risk workflows, etc. But I think work from home really underscores the importance of this. And it functioned incredibly well. You know, as everyone said, the moment that mattered the most, I think, in mid-March was the Fed. The Fed stepping in and stabilizing markets really brought things back into shape.

Obviously certain markets, you know, were hit more aggressively. But I do think that the electronic and really the infrastructure held up incredibly well, allowing for price discovery, allowing for execution under incredibly extreme conditions. So, you know, the value of electronic trading varied by markets. TradeWeb has a wide variety of different markets we're in. But I think when it comes to credit, one of the nice features is we have a number of new technologies that platforms

have been providing, which I'll talk about a little bit later, that further eased some of the stress in the markets.

March, April and May for TradeWeb were three of the highest volume months we've had on record. And given the dislocation, it's really incredible to see this. As we see, Gilbert has moved into this first slide here. This is a little bit repetitive of some of the things we've seen. But I think it is important for one purpose alone, which is you can see the spike in pricing across the curve here.

But what's really relevant, I think, is this information is now available; right? So if you roll back the clock a number of years ago, you just couldn't have this kind of time series information. Even from TRACE, you didn't have real-time prices the way you have TradeWeb's product is AI-priced where there are real-time prices being generated. Other participants -- Rick has a feature as well that allow for this e-data that's available real-time.

If we go to the next slide, you can see some more metrics here. I think the models, as you can see in the upper left-hand corner there, were not as effective in terms of the immediate stress in March. If you go to the lower right-hand column, you can kind of

see what was actually going on, which, to us, is the price something was executed at versus the next best price in the market.

But the point is the real-time models are really now available. And I think that that eased things considerably. I want to talk -- if we could go to the next slide for a second, these next two slides are really just the surge in at-home use. So our credit markets, you can see in February and March, we had more users than we've ever had log in. And these are actually instances where individuals are trading.

If you flip to the next slide, system-wide on TradeWeb, we had, you know, 6,000 users logged in. Across our whole system, we were over 100,000 users logged in. These are users who went from a work environment to a home environment incredibly seamlessly. You know, not everyone was the same. A lot of firms had their own infrastructure that functioned incredibly well. I think this is one of the key factors in lowering the stress in the market.

You know, obviously the Fed was No. 1. Let's not kid ourselves. That was the most important thing. But having this functionality available at home, I think, was critical in terms of easing the stress. If we go to the next slide, yeah, this -- Rick talked about this a little bit. This is all to all. This is another new protocol in the market in -- you know, relatively new in the last several years where the markets, buy side, sell side, everyone is providing liquidity to everyone else. That, of course, spiked in March as a percentage. These are the TradeWeb numbers, up to about 40 percent in March.

Tailed off as the market sort of started to normalize but then has kind of recovered now so that fully 30 percent of the business not on TradeWeb is in an all-to-all, you know, anonymous environment, which I think is, you know, a significant change in terms of access to liquidity for the market. The next slide, I'm back to talking about the Treasury market. You know, TradeWeb is known as a rates platform.

But the -- I think why this is important to remind people of is even in the context of the credit markets, when you see this kind of bid-offer spread -- right? -- the 3 p.m. spot time is when a significant portion of our passive investment flows get spotted. So it's very related to the credit markets. You had this incredibly -- it's the widest I've ever seen in my lifetime. It actually spooked me more than anything that week, was the bid-offer on, you know, the most liquid market in the world, the Treasury market. So

folks needed to hedge their credit positions with the Treasury market. And with such a wide bid-offer, it added further stress to the situation. So if you go to the next slide, please, you can see a new kind of technology that we've been applying to the markets which allow a link to a live electronic Treasury trade at the time that you're doing your credit trade. So this is what we call electronic spotting linked to a Treasury hedge on IG trades.

And you can see on this slide how much even in voice-processed business -- so these are trades that are done over the phone on credit but get a link into an electronic Treasury trade. So I know we're going to work hard on trying to come up with definitions for electronic trading, which we talked about at the beginning of the session this morning. But this is another little complexity to dividing things properly because here we have a processed credit trade, which we report as a processed credit trade, but it's linked to an electronic Treasury trade.

So I think it's interesting to see the surge here. I think that this netting functionality that we have, which eliminate the bid-offer at a time when the bid-offer is so wide, tremendously helped, you know, our clients on TradeWeb. And you can see the spikes as a

result of that during the times of stress.

If we go to the next slide, please, Gilbert --

Yeah, this is just illustrating some of the savings. So if you look at the savings and you do the math in the month of March, just this savings on eliminating this bid-offer was, you know, approximately $5 million in the month of March because of the value of netting out this wide bid-offer, which was up to 35 bucks a million, as you can see, on 150 billion -- trades. Now, that's normalized now that the markets have normalized. So, you know, it's come down. But at that time of stress, clients were able to access that kind of functionality and get a bit of relief.

If we go to the next slide, I think this is another example of innovation, tech innovation, that I think is really gaining speed in the credit markets. This is a function we've had for several years. We call it portfolio trading. We introduced this in 2019. And it allows a client to electronically trade a portfolio of up to now 800 different bonds at a set price with a single counterparty. And you can see what happened here in the month of March. As this pressure on liquidity hit, the need for efficiency, everybody is at home. They are trying to get a bunch of things done. You see a -- you know, kind of spike and a continued growth of

portfolio activity. It's normalized a little bit here as you go out to the tail end in terms of more recent activity.

But, you know, this has become particularly popular as a way for clients to trade large baskets of bonds in a single transaction. You have the link to index activity. You have the link to ETFs. But in a time of crisis, you also have an ability to do a large number of bonds moved with one keystroke.

We go to the next slide, we show a little bit of what's been going on in portfolio trading, you know, both -- this is the TradeWeb portfolio volume. So you can see the actual share of the market. We're now up to doing close to 50 percent of portfolio trades and how it has continued to grow. It's not necessarily -- you can see in the heart of the crisis, I think there was a little bit of panic. So people weren't trying new things in March. They were trying to find liquidity. But I think the follow-through now has been very evident that portfolio trading is another technology innovation that will assist clients in doing things more efficiently and at a lower cost. So I wanted to just make one last point. I know Gilbert is going to be ruthless on my time allocation. So hopefully I have a couple of seconds still. The one thing I would notice, a lot of the things worked incredibly well; right?

We had the new technology tools working incredibly well. Rick pointed out the all-to-all activity, the network effect of what's going on with credit trading was tremendous. The systemic integrity of our technology -- and I mean collectively, our technology, right down to the phone companies, allowed us to move to a work-from-home environment incredibly seamlessly at a time of, you know, incredible stress in the market.

Where were there some challenges? I would say from our perspective, we saw a slowdown in some of our AI tools. So we have some rules-based technology that allow for a quicker trade than just a click to trade where there is actually an algorithm, essentially an algorithm, that allows trading to occur. That slowed down significantly in March and April as a result of the -- you know, the seizure in the market.

So anyhow, the -- I want to say that was probably the only thing that we noticed dropping that's since come back. I'm incredibly proud of how well the market performed given the magnitude of stress. And I've been around long enough to have been through the '08 crises and the 9/11 crises. And I think thankfully we had electronic trading and connectivity that allowed

for a much more easier way for people to connect and trade during the crisis. Thanks. Thanks.

MR. GARCIA: Thank you, Lee.

I want to say thank you to Kumar, Scott, of course, Sonali, Rick and Lee. And sort of tying it all together, I want to ask Larry to sort of step in and just, as I turn off the sharing of the video here, let Larry kind of tie it all together for us. And then I'll have, like, 30 seconds of closing comments. And then we'll turn it over to Michael Heaney. Larry?

MR. HARRIS: Thank you. A few quick key points. When company revenues fall but expenses don't fall as much, companies get in trouble, and credit qualities must suffer. Fed actions that can improve liquidity and, for a while, even support prices but they ultimately -- the Fed ultimately cannot support credit qualities. And so it's very important that we get the real economy back on track.

The extraordinary expansion of the money supply by the Fed must raise concerns about inflation. Such concerns will ensure that the Fed will not always be able to act as it did in March 2020. Accordingly, it's very important that we consider where else we can find liquidity. Electronic trading is only part of all secondary trading. The Greenwich results that we've

seen show that electronic trading is only 20 to 30 percent of all volume depending on credit quality.

Trading off electronic venues, thus, is quite significant, though, as Lee mentioned, it's obviously quite important when everyone had to go home. So being able to trade on electronic venues is very important. Rick and Sonali's bid-ask spread results show that the spreads on electronic venues rose and quite substantially. And they are topping out about 18 basis points for investment-grade securities.

These trades -- these spreads primarily reflect trades among dealers and not necessarily the prices that customers receive, although, to some extent, customers are in that flow as well. The spreads associated with actual customer trades rose substantially more. In analysis that we didn't have time to present, I measured these spreads from TRACE reports of trades that involved customers. And those are all customer trades.

Spreads for institutional size customer trades rose to about 100 basis points from about 25 before. Those for retail size trades rose to about 250 basis points for investment-grade securities from a base of about 50 basis points and to 350 basis points for high-yield securities from a hundred and -- a base of

about 125. Many of these trades were riskless principal trades. Those are trades for which a broker-dealer typically obtained liquidity from an electronic venue or perhaps another broker-dealer and then passed through the position to the customer with a markup. These markups also increased in March 2020, although most of the increase was for trades that appeared to have been arranged outside of electronic venues where the broker-dealer had more of a touch.

Ultimately, the markets cannot always depend on the Fed for liquidity. Liquidity comes from entities that are willing to commit capital. Additional liquidity can come from figuring out how to get more liquidity from current participants or from figuring out how we can get more participants to offer liquidity. Clearly, we must consider both sources. But the lowest-hanging fruits probably will be found by making it easier and more rewarding for more entities to provide liquidity. Rick's results show that new market participants are increasingly active in MarketAxess, suggesting that new liquidity will largely come from nontraditional participants. Thanks.

MR. GARCIA: Thank you, Larry.

So, team, hopefully you can see that there is a lot here. Before I turn it over to Michael, I just want to say another thing that's extraordinarily different this time is the technology of video and the concept of trading and seeing people in video. And I think the most important thing anecdotally, it reminds us that behind all the numbers, behind all the markets are people. And I have seen in the background in the most tense of times of doing trades dogs barking. I've heard babies crying. I have seen people fall asleep, and all you could see is their arm hanging up. I have seen people laying down and with curlers in their hair. At the end of the day, the markets are still people. And that's why it's so critical that we do all of our best to keep these markets efficient and we keep them working for all of us.

Michael Heaney, I turn it over to you.

MR. HEANEY: Thank you very much, Gilbert, and all the presenters. This was a terrific presentation and a very, very solid and thorough report. So I thank everybody who participated in it. I do have a couple of questions. Let me -- albeit he's on the presenting committee. But I would like to start with Kumar.

MR. VENKATARAMAN: Thank you. Thank you, Michael. I agree. This was a fascinating presentation. I learned a lot listening to all the remarks. My question is the following. So it's clear that the event

in March 2020 was sudden. It was a massive shock, economic activity. The market was resilient, recovered nicely both with new issuances and with secondary market trading. Electronic trading platforms played an important role. But overhanging all this is the unprecedented Fed intervention which calmed the markets and help reverse the sentiment.

And so for a moment, if we assume that this type of massive Fed intervention in the market should not be expected to be the norm, are there any sort of structural weaknesses that we were able to identify, particularly in the early phases of the pandemic shock? And if so, are there things that we can do to address it so that, next time around, the market is resilient, even if the Fed intervention is not as massive?

MR. HEANEY: So let me just open it up to the subcommittee to respond. While thinking about that, the one thing I will say, and it was a question very similar to Kumar's, was the -- had the subcommittee considered the implications had the Fed not acted as aggressive, which is basically exactly where Kumar is going. Were there additional measures, perhaps, that -- also that the subcommittee felt that could have been adopted that weren't? Based on the initial comments about how successful the Fed was, etc., it seems like that may not

be the case. But I just -- I'll add on to that part of Kumar's question and see if the subcommittee would like to respond.

MR. HARRIS: I'll speak a little bit to it. The most important part of the Fed's intervention was to ensure that companies with refunding needs would be able to refund. In a period of uncertainty, if the people -- as the companies have to pay off their old securities and issue new securities, if they are doing the payoffs but they are not able to issue the new, they are going to run into big trouble. And so I think this is, by far and away, the most important function of the contribution of the Fed at this time.

As to secondary trading, secondary trading is obviously affected by potential problems in the primary market that might spook it. But by and large, it seems that the mechanisms work. Spreads clearly close as people became more uncertain about values. But as that uncertainty went away, the spreads dropped as well. If we can get more liquidity into these markets from other sources by relaxing some of the constraints that Sonali spoke to or alluded to on the traditional dealers and by finding ways to get other people to provide more liquidity, then we'll be better off in the future.

MR. GARCIA: And, Kumar, from my perspective,

Gilbert -- this is Gilbert -- I think that what was really extraordinary this time was the size of the fiscal stimulus and again, focusing on keeping consumption going, which, of course, we all know is about 70 percent of the economy or so. That's what was really critical at this time. I think government and Fed learned from Lehman, which is why I think they acted so decisively.

And we'll really never quite know if we would have turned into a Lehman moment because, if you blinked your eye, you might have missed everything. And you might have thought nothing has happened because that's how quickly things began to settle down. And I really think we cannot underestimate the impact of the willingness to buy credit. Just saying we're going to buy credit was all it took to really stabilize those markets.

Sonali?

MS. THEISEN: Yes. I would agree with that. And I think -- you know, I think Rick said it earlier. You know, this was an exogenous shock that hit globally to every sector at every moment; right? So I think that the calming -- like I think the markets behaved really well, and it was a really great collaboration between public and private sector. I think that as soon as like

-- to put to Gilbert's point, just if you go back to the actual, you know, utilization of the credit facilities, it hasn't been a lot. It's just a signal to the market that calmed the market and caused -- market did what it -- what it needed to do.

I think there is an open question as to whether more should be done to prepare for the next -- hopefully this is, you know, a once-in-a-hundred-years event; right? And hopefully there is not, you know, this extreme event for the marketplace, you know, again that affects, you know, the entire globe in every sector simultaneously.

So I'm not sure, you know, outside of some of the points that we touched on a bit in my presentation towards the end, like I'm not sure that there is all that much more that could have been done. And I think the important thing was that the markets responded swiftly to actions that were taken. They didn't stay spooked.

MR. OLESKY: Yeah. The only thing I would add, if I could, I agree with everything Sonali was just saying and, Gilbert, what you were saying. The only thing I'd add is, Kumar, in terms of, you know, how do we -- every crisis is different, first of all. So we -- this was just such a unique event. Hopefully we don't

have to deal with this exact situation. But I do think a few things that have proven to be incredibly helpful and will continue to be more and more helpful is the interconnectivity and the strength of our infrastructure.

I think that that is just an absolute -- we're in good shape now, as was proven by tens of thousands of people going remote or working from home instantly. We could work on that. We could continue to invest in the technology, the communication points, the analytics, the data, those types of things that will get people comfortable. The Fed action is a different level. I can't really speak to that even. I think that that was so seminal here that that's -- let's leave that to the side.

But I do think we could continue to invest in our connectivity because, ultimately, if you have the whole network connected and able to interact and find the other side of their trade, it will make for the best situation that's available at the moment. It doesn't mean that we're not going to have other, you know, stressful times in markets where the bid-offer is incredibly wide. And there may very well not be buyers or sellers at a particular moment. But if you invest in that network and connect up, you will be able to make

for the most efficient transaction that you possibly can, which will assist the market.

MR. HEANEY: So can I just follow up on that? I'm going to say to ask it of Lee and Rick, but it's really of the sub-co. And it's exactly again that point. So this recent time of market stress clearly pointed to electronic trading venues as a very, very suitable outlet for transmission of risk. We've seen it in the past. And I don't mean overall but in spurts. And it stops and starts at times.

Does this subcommittee -- and particularly -- I'll start with Lee and Rick. Do you think this is different? And so if we fast-forward to what is considered more normal times in either 2021 or thereafter, is this percentage of volume on elec-trading platforms do you think stays, sticks, maybe even grows? So is it more of a more permanent change in a risk transfer? It certainly was for five months and has been steadily increasing. But do you think this creates a change to your point, Lee, so that in 18 months' time, in fact, it's actually still growing and it's a seminal change in just the platforms as a percent of overall risk transfer?

MR. OLESKY: Michael, I think it is an acceleration. I think that there are events in history

that accelerate what was inevitably going to happen. And this has clearly been an acceleration from our perspective. The fact that we were trading a trillion a day and on one day traded a trillion and a half in the month of March with, as Rick said for his system, many multiples of the number of messages that we could ever have imagined we were going to get into the system and everything held up, I think this does accelerate further digitization regardless of when people start finding their way back to the office.

I think that, you know, the change has occurred. I think it will continue to accelerate, though. I think that there will be more and more. Credit markets are 30, 35 percent electronic. You know, our Treasury markets are over 50 percent electronic. The markets are different in different asset classes and products. But I think they are all marching towards more digitization. This is just an example of why. And I think there will be more and more innovation that will lead to more seamless interaction between this wide community that might want to buy or sell an instrument.

MR. HEANEY: Thank you, Lee.

MR. McVEY: Yeah, I just -- you know, you're obviously talking to two people that have a vested interest in the growth and tend to be optimistic about it in general. But I'm encouraged by what I see as well. In fact, you know, July and August were very low volatility months for fixed-income trading in general. But the electronic share held up at spring levels and in some places increased.

You know, and we're talking, you know, mostly about high-grade and high-yield corporate bonds. But we're seeing across every market in the world that the electronic share is growing. And I -- you know, I think the benefits are front-to-back. There is a lot of data generation that is fed back to fixed-income market participants that helps them with price discovery. The all-to-all growth has brought new capital into our markets. It's really important to drive down transaction costs. We see that growth every single quarter where there are not only new entrants but the ones that had come in over the last three years or so are getting larger. We also see a behavioral change where people are realizing that there is a better risk transfer mechanism available today than where we were four or five years ago.

So you see dealers really, in my mind, embracing more electronic trading. It's efficient for them. They are able to get in the middle of more trades with their clients. They are investing very heavily in

-- to be responsive to their client demands. And let's not forget about the huge increase in efficiency, in reducing errors and cost savings post-trade. So the immediate post-trade APIs that go back to market participants really drive down costs after the trade as well. So I would be optimistic. You know, another market, Michael, that you will be very familiar with, high-yield, if you -- we had our volumes out this morning.

But a year ago, the high-yield market share here in the U.S. traded electronically on MarketAxess was about 10-and-a-half percent of TRACE volume. Today's numbers were 16 percent. So tremendous growth in a market that a lot of people said would never go electronic. And you're seeing the same benefits coming through in high-yield.

So I do think we've opened up the market in a very positive way. It's driving down transaction costs. It's improving in efficiency. And I think it's coming as a benefit to both dealers and investors. And for that reason, I think it's likely to continue to grow.

MR. HEANEY: Thank you, Rick. Can I turn to Sonali, please?

MS. THEISEN: Sure. Thank you, Michael. I would agree with everything that Lee and Rick have

mentioned. And I think it's an important point that Rick raises, the operational efficiencies going forward. And I think if you look broadly at the electronification of the credit markets, what we've seen -- right? -- is the -- that the search function has already been improving with data.

So, you know, investors have an easier way to be more targeted in their engagement and where they want to look for liquidity. And I think what's been an interesting catalyst, you know, through these recent months, as Rick and Lee mentioned, that, you know, just consummating that trade electronically and the operational efficiencies, I think that part will only continue to grow.

I think the balance of by what protocol that is consummated will, you know, reflect that the market dynamics -- so whether that's, you know, all-to-all trading that Rick and Lee spoke of, whether it's disclosed RFQ, whether it's completely bilateral and executions that can happen through bilateral API that Larry touched upon -- Larry Tabb touched upon, you know, I think that that blend will find some equilibrium and then obviously also change during periods of volatility to some extent. I fundamentally don't believe that, you know, the actual search function in the market and --

that's going to, you know, change drastically from what we see today here, let's say, you know, a central order flow or -- or those types of protocols for corporate credit because I don't think it's suited to those protocols to the extent that other markets are. But that said, again, like, the electronification and that spectrum will only accelerate.

And I -- you know, we have -- we hear from -- you know, from a number of our key investors, investor clients that, you know, state their goal is to get to 100 percent, you know, electronification and sort of, you know, the operational efficiencies of booking transactions in the near future. So I do think that this was a good catalyst that spoke certainly from the sell side perspective, as Rick highlighted. It's -- you know, the efficiency of being done on a trade and having that, you know, book and go through and no one having to double-key it, it's quite obvious. So I think that, you know, as I said in my comments, this has been a good sort of silver lining to the pandemic for the markets going forward.

MR. HEANEY: Thank you. Let me go to Brad Winges, who has lodged a question or comment as well.

MR. WINGES: Yeah. I was just going to essentially agree with Lee and Rick. I mean, the silver lining of what happened in March and April certainly was the acceleration for the broker-dealer community of what we all saw coming, which was the trend going to the electronic market. It created all the efficiency, created the ability for faster execution. And as a large clearing firm as well, it certainly made -- the electronic execution made it a lot less likely for an error touching those securities. So if we look back in March and April on the events and sending everybody into remote environments, certainly that was a silver lining benefit of how the markets performed, which we didn't have the benefit of that nearly to the degree in '07/'08.

MR. HEANEY: Thank you, Brad.

Gilbert?

MR. GARCIA: Yeah. Michael, from the buy-side community, there is no doubt more people will use it. I think that whatever uses there was before COVID, COVID made us use it more. And we realized not only is it easy. Not only is it fast but the whole compliance end of it makes it so beneficial. The keeping track of best execution, the keeping track of all the bids and offers and everything together in one location, it just makes the whole compliance end of our business that much easier. And I'm not so sure we all appreciated it until

COVID.

MR. HEANEY: Thank you, Gilbert. Any other comments or questions before I turn it over to ask Brett and the commissioners?

Okay. Brett, any questions or comments?

MR. REDFEARN: No. This has been a fantastic discussion. I really appreciate it. I've actually learned quite a bit. And I think there is a lot of great insights here. I guess the -- you know, one of the themes that we've had is lessons learned. When I think about the amount of electronic trading that we have been seeing, you know, I think to Lee's comments about, you know, the investment and communications and the underlying resiliency, the market, those are obviously important technological investments.

I guess, you know, the only question I have is for regulators, if there is anything else that we should be thinking about in terms of ensuring the -- you know, the appropriate regulatory framework going forward as well, you know, in circumstances like this where, you know, we -- just what can we learn such that if we deal with these things again, we are fully prepared or even more prepared than we were last time. I'm just throwing that out there if anybody has any additional thoughts on that.

MS. THEISEN: I think it -- perhaps, you know, it speaks to the importance of the recommendation that was put on the table today that, you know, again, knowing exactly what venues are out there, where trades are getting done and by what protocol has become, you know, more important than ever to ensure that, you know, there is a clear understanding of how sort of the pipes and the ecosystem are all fitting together.

MR. OLESKY: Yeah. I agree with that, Sonali. I think you're absolutely right. This does highlight the recommendation that was made earlier in terms of harmonization. It's challenging also, though, I would add, because everything is changing. So, you know, we had these debates in terms of defining e-trading in our subcommittee. And I know that this will be a challenge going forward as there continues to be innovation with new protocols. Is it electronic? Is it voice? Is it a combination? What is it exactly? We're doing that on trade right now where we have a voice process trade linked to an e-Treasury trade.

I think that will continue to evolve. And really we need the Commission to kind of be on its toes in terms of trying to react to but not stifle the innovation that's likely to surge forward as more and more capital will be invested in this space. I think

this is a clear area where capital will flow because of the opportunity. And the innovation may just even heat up more.

So it will be a challenge to kind of keep up with that from a regulatory standpoint because it's -- you know, every day, it feels like, it's changing a little bit. And a year or two from now, I'm sure when we look back, we'll say, "Wow. It's even changed more than we thought."

MR. HEANEY: Interesting point. And again, the purpose of this is to think about those kind of challenges going forward, what we learned from the last period of volatility. So I think that's certainly wise comments and a warning, in so many words, for the Commission. Let me turn before we run out of time and just to ensure -- and see if any of the commissioners' questions or comments --

Okay. Other FIMSAC members, questions or comments?

Gilbert, again, I want to thank you and the entire subcommittee. This was an incredibly informative presentation. And as Brett said, we all learned a lot. So appreciate the time and the efforts being made in what's a very challenging time as it is. This was, I think, incredibly insightful for all of us and hopefully for the Commission as well.

David, I think at this point, if we can, we'll take an eight-minute or seven-minute break, and we will resume at 11:30. I would ask for all FIMSAC members to just keep the video feed -- keep it on as you take this break, and we will reconvene at 11:30 sharp.

(A brief recess was taken.)

MR. HEANEY: I would like to welcome Chairman Clayton to the FIMSAC meeting. Good morning, Chairman Clayton, and I'll turn to you for opening remarks.

CHAIRMAN CLAYTON: Thank you, Michael. And thanks to all of you for being here at least virtually. Recognizing that this very productive meeting is well underway, I will take just a few minutes to share some thoughts. More detailed remarks will be available online.

First I want to thank each of our committee members for their tremendous efforts to further the work of this committee, especially as we have all had to adapt to working in a new environment. Your contributions to the Commission have been significant, and I assure you they are continuing. Second, I am pleased to welcome new members Darryl Street, Robin Foley, Ola Persson to the committee. We look forward to working with you and benefiting from your experience and

insights. Third, I continue to be impressed with the breadth and depth of the issues the committee has raised and the recommendations you have provided for consideration by the Commission and by Fed. I believe this is a product of the diversity of experience, candor and commitment of the individuals who have given their valuable time to the committee.

There are more details on your varied and impressive backgrounds in my posted remarks. And despite the potential challenges associated with incorporating your diverse viewpoints and reaching consensus on difficult issues, you have succeeded in making 16 recommendations to the Commission over the course of 11 public meetings since the committee was established in 2017. I had high expectations for this committee when I began my tenure and decided that we needed to hear directly from fixed-income market experts. And you have exceeded even my highest hopes.

Here I want to express a special thank you to Michael Heaney for his leadership which promoted collegiality, rigor and productivity. Fourth, I would like to highlight just some of the many recent actions that have benefited from your past efforts. Last week, as part of our proposal to extend Regulation ATS and SCI to treasuries and government securities, the Commission

issued a concept release of electronic corporate bond and municipal securities market. In the concept release, drawing on this committee's recommendations, the Commission solicited public comment on a range of issues that will help inform our future policy concerning this critical aspect of our fixed-income market structure.

Additionally, FINRA recently issued regulatory notices related to committee recommendations regarding the practice known as pennying as well as TRACE reporting for certain corporate bond trades. Fifth, today, the committee considered a recommendation from the Technology and Electronic Trading Subcommittee to improve our collective ability to better understand electronic trading volumes in our corporate bond and municipal securities markets. I understand and support the desire for this enhanced transparency. And I appreciate your attention to this matter.

Finally, I am glad you are discussing how our fixed-income markets performed in and since March of this year. To date, our fixed-income markets and our financial markets more generally have weathered volatility and uncertainty admirably but we cannot rest. I view today as a valuable opportunity to reflect on and assess our fixed-income market structure in the midst of

these unique circumstances. I look forward to the rest of today's discussions, and I do hope that you will not mind if I participate actively this afternoon. Thank you all very much.

MR. HEANEY: Thank you, Chairman Clayton. I'd like to take a minute and just go off script and thank Chairman Clayton for his incredible success and the dedication leading the Securities and Exchange Commission over the past four years. Chairman Clayton's swift action to form the Fixed Income Market Structure Advisory Committee was incredibly insightful and timely and correctly pinpointed the issues overhang various sectors and securities within fixed income. It should provide real benefits to the marketplace both now and in the future.

And Chairman Clayton, it's been an honor to work for and alongside with you. I thank you for the opportunity to be part of FIMSAC. I know I speak for the group at large. It has been a pleasure to serve.

MUNICIPAL SECURITIES MARKET OBSERVATIONS AND LESSONS LEARNED

MR. HEANEY: Next let's turn over to the part of the agenda where we will go to municipal securities market, do the similar deep-dive that we just experienced with Gilbert and team and the corporate bond. It will evaluate the impact of COVID-19 and the associated market volatility in the municipal securities market. I want to remind members to manage the discussion. Please email with an interest to speak or questions to ask. I'll now turn it over to Lynn Martin, chair of the Municipal Securities Transparency Subcommittee.

Lynn?

MS. MARTIN: Thank you, Michael, Chair Clayton, SEC commissioners and SEC staff for the opportunity to present our findings to you today. What you'll hear from our commentary at a high level is probably consistent with what you heard from the corporate bond subcommittee, one that is focused on the resiliency of the ecosystem that has been built since the financial crisis, which helps muni markets recover quicker in spite of unprecedented spikes in volatility.

An interesting parallel here is that the activity in the muni markets is not that dissimilar to what we saw in the U.S. equity markets. And that's interesting, particularly given the presence of retail in this market. This is a -- best characterized as one of short-term panic, is what we saw. The panic fueled an unprecedented spike in volatility starting with the end of the first week in March that most acutely

persisted throughout April as many participants were looking to exit positions to keep cash on hand. We believe that this wasn't because the market lacked confidence in the functioning of the muni market. And this is evidenced by the fast recovery which we'll show you today but more so, again, due to the general macro uncertainty, which was most amplified in late March and then, once the regulators had stepped in, had calmed down.

We think the underlying confidence in the muni markets and the market structure enhancements that have been made since '08 and '09 as well as a calming of equity and other fixed-income market volatility due to federal stimulus helped abate the volatility that we observed and facilitate a quicker recovery despite the unprecedented spike in volatility.

Before we start off, I want to thank some of my fellow subcommittee members, specifically Brad Winges from HilltopSecurities, Suzanne Shank from Siebert, Williams & Shank, and Mark Kim from MSRB who all contributed to this deck. You will find their contributions noted in the footnote and on the material, which I consolidated really for the ease of presentation. Additionally, I would like to thank Lee Olesky from the e-Trading Subcommittee for his deck

which we'll also turn to during our conversation today. So let's get to it.

Similar to the Corporate Bond Subcommittee, our task was to look back on the last nine months and provide observations and lessons learned. Our presentation is going to examine the muni markets over the last nine months from three perspectives, some of which are unique to the muni market. First area we're going to look at is market fundamentals, such as activity levels, both at MSRB, as well as on ATS's, volatility, liquidity metrics and spreads to other fixed-income markets.

The second area -- and again, due to the unique structure of the muni markets, we're going to cover something near and dear to the heart of this subcommittee, which is disclosures, and specifically the amount of COVID-related disclosures that we saw since the crisis. And three, we are going to talk about the amount of new issuance through 2020 and specifically the impact of the Fed's Municipal Liquidity Facility in the new issuance process.

Like Gilbert, who is going to be a hard act to follow, I'm going to give my observations with the first couple of slides, and then I am going to, since it's football season, something that we like to pretend is

not happening in New York, quarterback the rest of the presentation and allow my e-trading -- the e-Trading Subcommittee as well as my fellow Municipal Subcommittee participants participate.

So let me share the deck. We're all becoming Webex experts. Okay. I want to make sure everyone can see the deck. Can you -- look good? Thumbs up? All right. All right. So let's get to it. So let's move to slide 2. Figure 1, the light blue represents 2019. The dark blue represents 2020. And it is the MSRB trade count, compare 2019 versus 2020.

You will see that with the exception of March and April, trade counts are down in muni markets. So we thought it was important to figure out, okay, what area do we see the lower activity. Moving to Figure 2, you see the light blue, which is all trades, and then the dark blue, which represents what I would call dealer size or institutional size trades, trades that are greater than a million dollars notional.

What you see here is that the dealer participation has held pretty steady, except August, which is a pretty quiet month with the exception of March, April, June and July. And what I found most interesting was, in June and July, you see the -- all trades in the market decreasing despite the fact that you saw the larger institutional size trade count increasing. So what that really shows is that the smaller trade size, the retail trader, is not participating as much in 2020 with the exception of March and April, and has not come back as robustly as the larger institutional trade sizes since the market. And I think that is something that's really important to highlight, particularly as we start to go through some of this presentation.

Slide 3. So we tried to examine the liquidity profile of the market, which is sort of tough to do. So my team and -- here ran one scenario that we thought would be helpful to really illustrate the liquidity in the muni markets, particularly at the time of stress. We took the ICE Bank of America Broad Muni Market Index, which has about 18,000 holdings in it, alongside a product which -- we have it, ICE Data Services, which measures the liquidity of a security and the number of days to liquidate a certain size position.

Now, for this example, the portfolio that we looked at had 25 million in notional and allocate based on the weightings of the index, which gives, across those 18,000 securities, an average of just over $1 million per holding. For this exercise, we wanted to have an impact on market price of no more than 50 bps.

And what you see from the display is that the percentage portfolio can be liquidated in certain time horizons. And what you see at the end of February as well as early March is that, you know, more than 95 percent of that portfolio could be liquidated in less than or equal to one day.

And then the -- towards the end of that first full week in March, you started to see that liquidity significantly deteriorate. And at the worst, by March 25th, the peak of the volatility in the market, you had that same portfolio with only 55 percent of it able to be liquidated in less than or equal to a day. And importantly, you saw an increase in the amount that was going to take more than 31 days to liquidate, showing that the liquidity had significantly deteriorated, probably unsurprisingly to anyone who was active in the muni markets back then.

Towards the end of the month, though, I found this quite interesting that as soon as you saw the Fed come in, as soon as you saw the macro effects of the stimulus start to come in, it eased the market. It calmed down the market. So you saw the amount of liquidity actually significantly improve by the end of the month. And then it was okay, I would say, through the end of -- through the middle of April. Subsequent

analysis we did here shows that it got back to these levels by the end of April, which is pretty impressive considering what had occurred towards the middle, towards end of March. And actually, that is one month faster than similar analysis we did for the corporate bond market.

Slide 4 is going to talk about yields and bid-ask spreads. So Figure 4, you see the average yield to worst really start to converge towards 2016, across taxable, tax-exempt and treasuries, particularly treasuries and the broad index, the broad muni index I mentioned earlier. In late 2015 through February 2020, you saw pretty good convergence there.

But then, as a result of volatility, you saw that convergence blow out. And that divergence hasn't -- has persisted, as we talked today. In terms of volatility, slide 5 shows historical annualized volatility spikes across tax-exempt and taxable municipal bonds. In 2008, you see a fatter spike, meaning it was not as severe. But it persisted for longer, reflective, perhaps, of a time when Fed support mechanisms for the market was less understood relative to today. And you see a spike in May of 2013, which was the taper tantrum, and then a record spike in March and April. Again, look at the -- the relative spikes that

occurred in March and April, much more pronounced but much shorter in duration than what you had seen historically.

Finally, Figure 6 shows muni bonds also had dramatic changes in bid-ask spreads. And this is reflective from our own e-trading venues, specifically BondPoint and TMC. Pre-crisis, January and February, the average bid-ask spread was about 20 cents and then spiked up to 50 cents during the -- during mid-March.

Bid-ask spreads are still at about 35 cents, which is still high compared to pre-crisis levels, but they have significantly improved since where they were during the crisis. With that, I think this is a really good time to turn it over to Lee, who will share some of the observations that he saw on his trading platform.

Lee?

MR. OLESKY: Thanks, Lynn, and thanks for quarterbacking the effort for the subcommittee. And thank you to the rest of the subcommittee for asking me, inviting me to join in this section. Let me just say a few things before we get into this page. You know, as I noted in the earlier session from an e-trading perspective, we've already been seeing growth in electronification of trading, digitization of risk workflows. But the crisis, as I -- we all said before, has really been amplifying the importance of this connection electronically and the data that's available to clients.

Clients need to find the other side of the trade. They need the data. Since colleagues were no longer facing each other, sitting next to each other, they were remote and working from home. On this slide, we have the MSRB ATS reported trades. And this particular slide, you can see the ATS notional and trade volume surged, you know, along with the overall markets to record levels, actually record levels since the implementation of ATS flag in 2016.

When we go to the next slide, however, what you see is ATS notional and trade volume as a percentage of the market which declined in March. And this is primarily due to retail desks being the primary liquidity provider for their clients because dealer participation in auctions declined. So March actually represented the lowest ATS notional volume market share in two years.

ATS share rebounded in April as markets normalized and both retail and institutional buyers started returning to the markets, as Lynn alluded to. If we go to the next slide, please -- and I said this in the earlier session. You know, we at TradeWeb took our

entire company remote within 24 hours. So that was about a thousand people. What's more important is the tens of thousands of traders and clients of the marketplace went remote at the same time.

So you can see in this slide, just as an example -- what's the top number? The top number is 135,000. So we spiked to 135,000 users of our -- this is just our retail business, our retail platform in the month of March. March 20th was the high number. So key is we were able to get people home and safe, from our perspective, and the rest of the market was following suit. And all of the clients were able to switch to this work-from-home environment rather seamlessly.

We saw an 18 percent surge, as you can see, in user participation during March crisis versus a typical month. And this is traders, wealth advisors, retail investors accessing the market despite being home and despite all the massive pressure in the marketplace. I'm really happy to report -- I can report for TradeWeb we were 100 percent available uptime, handled record price updates and messages.

And I think that that's largely true for all of the infrastructure really across the board. I haven't heard any situations where there was too much of a wobble in infrastructure. The first few days were a

little dicey, I think, in terms of the certainty of people being from home. But, you know, all in all, platforms held up incredibly well. If we go to the next slide, I want to talk just quickly a bit about, you know, what was happening on the platforms in terms of the different protocols that clients use. So this is just the RFQ slice of the world for munis.

And you can see what sort of happened in March. So you have an explosive growth in the number of RFQs. But as the crisis evolved, response rates suffered. I think this is an important point. You see the dip in the orange line down to -- I think it's about three in March versus a typical six or more.

So what happened, retail desk stepped in, providing clients liquidity, relied less on the street, I would say. But the protocols worked. It raised some questions if there -- more efficient protocols are needed maybe. But, you know, by and large, things were working. All to all, buy side participants took advantage of bidding bonds, were able to find great value for customers. Twenty percent of client-to-client activity on TradeWeb platform during March reported -- performed incredibly well. The other thing I would add here is that the algo market-making functioned quite well. So algorithmic firms were incredibly

well-prepared to handle this magnitude of sheer trading volume increase. Those firms who took an aggressive view stepped in to buy bonds performed very well after the volatility subsided. Then we saw more of the market come in. But some firms clearly stepped back from their risk-taking, I would argue missed a short-term opportunity and may have upset some of their clients. But the fact is, you know, overall, the system worked quite well.

You know, bidding was pretty indiscriminate. There were some trade issues. But, you know, all in all, it really -- it went quite well. The next couple of slides that I wanted to get to quickly are about retail, institutional, interdealer activities. So this slide, 6, is using sort of 100,000 under -- as a bucket for retails, proxy for retail. So we saw record volumes in March followed by a quick return to normalized volumes. ATS as a percentage of overall market fell, as I mentioned before, in March. But when market demand turned, buying was indiscriminate. So, you know, it was certainly a challenging environment.

We did see an increase, a 70 percent increase, in retail volumes in March. So that's the sort of demonstration of that chart. On slide 7, the next slide, you see what was happening on the institutional side of the world for TradeWeb. So TradeWeb had a huge surge in institutional. I think Lynn was alluding to this in previous slides. We had a hundred percent increase in buy-side activity on the platform, which is, you know, more than twice the normal volumes from February to March. And volumes since March continue to be at record highs for TradeWeb in this customer segment, this sort of institutional customer segment.

Interdealer activity trade count followed retail, institutional trends, but volume decreased obviously substantially in March and has continued to stay muted in the months after sort of on the interdealer side. When we move to slide -- the next slide, please -- this is the muni market weekly buy/sell ratio. So traditionally what you would see in the buy/sell ratio is a heavy weighting towards the buy side. Most individuals are buying. But buy side -- buy/sell ratio went negative March 20th, which is a very unusual circumstance where everyone was selling.

So this highlights the quickness at which the markets sold off. And then, you know, candidly, how quickly it started to recover back to, you know, now you see a totally different environment. You know, liquid bonds versus illiquid bonds -- the market was in a tremendous amount of turmoil. There was now selling.

It was indiscriminate. And taxable versus tax-exempt -- taxable volume remained steady through the volatility, steady increase in taxable volume. Since the tax law changed as a result of the tax cuts and the JOBS Act in 2017 -- and we've seen an increase in tax-exempt, you know, now the following March trends where we had these record highs.

I guess just a quick summary before I hand it over to Brad. I think he's up next. You know, while the short-term volatility was extreme and at times it felt like liquidity was impeded, I'd have so say, overall, the market operated fairly well given the stress it was under and the fact that, you know, so many people were working remotely. I think the electronic trading platforms -- Lynn's platform at ICE, our platform and others were resilient. They were reliable during the crisis and allowed for market participants to do this transition to work from home and maybe, even more importantly, provided new outlets for retail when needed; right?

What's most interesting to us was the increased electronic participation of buy-side firms, both as price makers and their reliance on the platform as a price taker. That was the surge in institutional that we highlighted before. So let me stop there and

hand it over to you, Brad, for the next step.

MR. WINGES: Yeah, thank you, Lee. I would agree the market was definitely more nimble than it was in 2008. And you can see that from the slide. Trading volume was about 9 million trades in 2007 and 2008. Activity was about 6.3 billion, annualized both years. You go to the next slide, you can see what happened in 2019, again, about 9.5 million number of trades down slightly to 8.5.

The trade count remained consistent, about nine-and-a-half million per year. But except for the muni or the March timeline, you can see the spike there. We've seen a lot of graphs that related to that. Three billion par value or 3 trillion par value trade versus 6 trillion back in the '07 and '08. So clearly the March liquidity shock was consistent across all products.

If you go to the next slide, drastic difference between '08 and '09 into 2020. All the ratio categories widen, not nearly as long of a timeline as 2007 to 2009, as Lynn had indicated. And then you go to the trading spread analysis. Similarly, lower credits widen more. You can see Connecticut, Pennsylvania, New Jersey, Illinois gapped out as the high-yield market was looking for more liquidity across the bond funds. We did see a rise in AAA activity -- escrows were out for

the bid. And then the market did quickly return back to normal. And I attribute this mainly to the Fed stepping in and, as Lee indicated, the ability of the market to work remotely and more and more people trading electronically than they had historically back in '08 and '09.

And, you know, you will typically see in a liquidity environment a rise in AAA bond activity and a rise in escrows and -- and intuitively, you'd wonder why and it's -- that's the most liquid short end of the curve as there -- bond funds are trying to raise cash. And then if they are still in a need for cash, there will be a wave of selling in the high-yield space, which tends to downdraft and cause credits to widen out.

So that leads to a widening of transaction costs, which we certainly saw. But that has certainly come back to a great degree, as the traders were all stepping back into the market. And it's more than just credit. It's also the fear of liquidity for the broker-dealer environment. So once the Fed did step in and the balance sheets were comfortable, the traders were given the green light to go back to normal in terms of participating. So you kind of had a cross current. You had a fear of credit. You had a fear of liquidity by the retail investor, by the institutional investor.

The retail market started liquidating their bond funds, which caused the institutional space to start to liquidate. And as the balance sheet started getting inflated on the broker-dealer side, there was a fear of liquidity and the ability to fund that.

The Fed steps in, gives consistent funding for the broker-dealer community so the trading desks were comfortable bidding the bonds and going along the bonds to the extent that they felt that there was value there. And then we're turning around and reselling them back into the retail and the institutional markets. So very, very surprising to me. You know, lived through '08 and '09 and certainly you saw on all the different graphs that Lee and others have shown that that was a much longer progression. I personally was extremely surprised how quickly the market snapped back after the Fed stepped in.

And I want to give the SEC credit for their willingness to allow the broker-dealers to be nimble and allow the traders to access the open markets outside of what I would call the bricks-and-mortar environment. Had they not done that and the Fed had not stepped in to provide liquidity and stability to the funding markets, I think we would have seen a pretty dramatic different outcome. So the speed of the SEC and the speed of the

federal government to step in along with the confidence in the liquidity market, I think we abated a much more significant, longer-lasting credit event.

And Horace, maybe you want to step in and give perspective from Raymond James.

MR. CARTER: Thank you, Brad. Yes. I just had a couple of observations that I wanted to share. And one of the things that I note about the presentations is that all of the or most of the information looking -- based on trade information. And we don't have a lot of information about the bonds that didn't trade. And so looking at just Raymond James information, we average about 4,000 selling freeze or bid wanteds per month. And in March, we had over 14,000. But our conversion rate, which is the bonds that trade, is generally between 65 and 70 percent. And our conversion rate drops to 20 percent.

So what we saw there is a lot of bonds that, for whatever reason, we were unable to trade or our clients were unwilling to trade. And my takeaway from that is that Lynn said it earlier. It was -- retail clients were panicking. They were indeed because they weren't selling individual municipal bonds because of an interest in selling that specific credit. They were trying to sell everything. And we saw it in the equity

markets. And the municipal market held up okay. Our response -- Lee had a graph earlier that indicated how much the response rates went down. We typically get between six and eight responses for an RFQ. And we got to one or two. And it was stratified by credit to a very large degree. So we got obviously more responses for the higher end credits, as Brad indicated. And there was more or less no market for high-yield.

That being said, I can't imagine what the scenario would have been like without access to electronic trading. So I think the institutional increase in electronic trading is a function of investors and dealers preferring speed over execution price. What institutional investors wanted was a price fast. And they wanted to get them access to the most potential sources of liquidity as quickly as they could. And the -- it's been said a lot. And it really can't be overemphasized. The way that the electronic trading platforms held up through this was extraordinary because we would not have been able -- we would not have been able to function as an industry without them. I truly believe that.

One other point I would like to make regarding the way that the market developed. So our conversion rate stayed under 50 percent through May. And Larry

Harris earlier mentioned that the market was beginning to rely on nontraditional market makers and that that was going to continue in the future. He's exactly right. And that's what we saw. The institutions that were providing liquidity out there were not necessarily the traditional market makers that you think of, the big houses in New York and so on.

And what I would say is this. The further that the individual investor gets from the market maker by orders of degrees, then the more implicit the cost is to the investor. And the cure for that, it's -- there's inevitability to it, just based on the way the capital structures are set up right now. And so electronic trading is going to become more and more important in those instances because the information flow has to become seamless to keep those costs as low as they can be. And those are my observations.

MR. WINGES: Yeah. One other thing. I like to jump in, Lynn, really quick is --

MS. MARTIN: Sure.

MR. WINGES: -- you know, given our analysis was around the muni market, the municipal market did not perform to similar than the corporate market, the mortgage market and other fixed-income markets. And I think that's an important highlight because oftentimes, the muni market gets viewed as less liquid, less efficient, you know, maybe harder to fund liquidity and the like. And it performed very consistent with its fixed-income peers in terms of products and recovered very, very quickly and was able to continue the new-issue market, certainly not to the extent that the corporate market had new issue volume, you know, beginning in April and May. But, you know, since that time, there has been a lot of new issue municipal activity and taxable municipals being issued. And I don't want to say they're back to normal, but they're certainly very fluid and operating efficiently.

MS. MARTIN: Great. We're going to get to that topic in just a little bit. Before we come to new issues, I want to turn it over to Mark Kim to talk about disclosures. Like I said, this is something near and dear to this subcommittee's heart.

So, Mark, over to you.

MR. KIM: Thank you, Lynn. As part of its response to the pandemic, the MSRB has been focused on bringing greater transparency to the market on the economic dislocation caused by COVID-19. To date, state and local government issuers have filed over 20,000 disclosures with the MSRB that have referenced the pandemic. In the chart on this page, it illustrates the

total number of disclosures that have been filed that relate to COVID-19 on a weekly basis since the start of the pandemic.

I wanted to highlight that on May 4th, there was a public statement issued by Chairman Clayton and Director Olsen of the Office of Municipal Securities that encouraged municipal issuers to provide the market with current information about their financial and operating status. Shortly after that public statement, we hit a high water mark in terms of disclosures being made. And we received over a thousand disclosures that week.

And we've -- you can see on this chart that we've hit that same high water mark exceeding a thousand disclosures a couple of times since then. The subcommittee received a question regarding how many issuers have submitted these disclosures. And I wanted to just share information that it's a challenging question to answer, in part, because of the unique nature of the municipal market where, as many of you know, there are conduit issuers that will serve as a pass-through entity for what is ultimately the obligor or credit underlying a particular issue. That said, we've done a preliminary analysis in order to give you a rough order of magnitude to kind of address this

question. And based on using CUSIP 6 or the base CUSIP as a proxy, we've identified approximately 12,600 issuers that have submitted disclosures that reference COVID to date.

I wanted to provide two other perspectives on how comprehensive the disclosures have been in our market during this pandemic. If you take that universe of all of the distinct CUSIP 6's that have traded in 2020, approximately 40 percent of those CUSIPs have a COVID-19-related disclosure associated with it. Now, viewed another way, if you look at the total number of trades that have occurred in 2020 using that same data set of unique base CUSIPs, then approximately 73 percent of the trades that have occurred in 2020 have an associated COVID-related disclosure.

Let me close by just noting that the MSRB has also received over 1200 disclosures for securities that have not traded at all in 2020, which highlights another unique aspect of our market. And that's namely the buy and hold type of investor who may purchase a security with the intent to hold until maturity. On any given day, there are -- the vast majority of municipal bonds will not trade. And indeed, there are some municipal bonds that will never trade.

With that, let me turn the conversation over

to Darryl Street, who we're fortunate to have as one of our state and local government issuers that has submitted these types of disclosures and to share the District's experience and the impact of the pandemic on their own capital borrowing plans.

Darryl?

MS. MARTIN: Darryl, you may be muted. Not yet. Try now. I see you trying to talk.

MR. STREET: I unmuted my -- can you hear me now?

MS. MARTIN: Yup.

MR. HEANY: Yes.

MR. STREET: Okay. Perfect. Thank you, everyone, and thank you for the opportunity to give the perspective of a state and local government issuer. Our office, the Office of the Chief Financial Officer, in the District is responsible for producing quarterly revenue estimates that the District's budget has to be balanced against. We had just produced our revenue estimate at the end of February before the full extent of the -- and the severity of the pandemic had been known.

Less than two weeks after that, as that information became more clear, Mayor Bowser issued her -- a series of public health -- orders which instituted stay-at-home orders, shutting of non-essential businesses, banning large gatherings, all of those things that we are now familiar with. It forced our office to go back and to revise quickly our revenue estimate, taking into consideration the shock of the economy that would happen with all the effect of those shutting -- that shutting down.

So in -- towards the end of April, our office produced a revised revenue forecast that we made public that for -- just for fiscal year '20 and '21 alone reduced our revenues by over $1.5 billion and over the course of the four-year budget financial plan that the District produces reduced revenues over $3 billion. Recently, just last week, on September 30th, our office also produced the most recent of the revenue forecast that updated/revised that information with the hindsight of the past quarter and past six months of economic activity for the District.

And just to take a step back, when we reduced our budget based on the April revenue forecast along with having to redo the entire budget, it had a drastic effect on the capital budget as well. We were required to stay within our statutory debt limits. And to reflect the amount of revenues that were available, we had to reduce our capital budget by $1.2 billion. So

there were some pretty significant impacts to the District.

In trying to just quickly summarize what our most recent revenue estimate said, roughly 75 percent of the District's economy is holding up pretty strongly. I think, in large part, that's due to the unprecedented amount of federal support that was given, as well as the shift to teleworking by the largely professional white-collar employment base that is -- the District is made up of.

Where this COVID recession really impacts us and, I would say, to a large degree other state and local governments is in our hospitality sector, hotels, restaurants, in-person retail, real estate-related services and even higher education. You know, take out the federal government, the largest employer in the District is Georgetown University. Three of the top five largest employers are universities.

So just to give a little more color, one data point, taxes -- sales taxes from our hospitality sector, hotels and restaurants in fiscal '19, were roughly $766 million. For fiscal '20, we're estimating less than half that. So we're down around $360 million and stay at a relatively low level, stay relatively flat, given the sort of prolonged nature of when we get back to a

full level of reopening of the District's economy.

We're also looking at potentially reduced property taxes going forward, has increased vacancies and reduced effective rents for commercial and multi-family properties start to affect assessed valuations going forward. So this -- on our -- it's had a significant impact on the District's budget. I will add one caveat, that the District probably came into this COVID recession in better shape than most other state and local governments in the country. We had 60-plus days cash on hand, fully-funded reserves, fully-funded pension -- trust, which is not the norm, I think, for most state and local government issuers across the country. So we were able to weather it slightly better at the beginning, but we're not immune by any means to the ongoing impact of that. And with that, I'll turn it over, I think, to Amy, who is going to talk about the impact of rating changes.

MS. MARTIN: I think we're actually going to come to Amy in the next section to --

MR. STREET: Oh, okay.

MS. MARTIN: -- to try to gather new issues and this item. So you heard from Brad. You heard from others. Obviously new issuance is important to the municipal markets. We wanted to look at it both from

how the public markets have gone but also from the MLF perspective. I'm going to hand it over to Suzanne to give an update there. And then, Darryl, we're going to come back to you for some observations having been an issuer in this market since the spikes.

So Suzanne?

MS. SHANK: Great. Thanks, Lynn. The municipal market started the year with very strong issuance volume in the first two months. I mean, we were 45 percent higher than in 2019 for the same two months. And it was really fueled by record low rates and 50-plus consecutive weeks of positive inflows into municipal funds.

Low rates continued to prevail into late February and early March, as fears surrounding the pandemic caused equity weakness and a flight to quality. However, by mid-March, market dislocations were evident, as municipal funds began to see widespread redemptions and were forced to liquidate bonds, leading to higher rates and soaring ratios to treasuries. And as Lynn and others have mentioned, we saw liquidity evaporate. The amount of bonds out for the bid continued to rise. And the municipal market effectively shut down mid-to-late March. The market gradually began to stabilize over the next several weeks as municipal fund outflows slowed, causing secondary bid -- to decline.

And after about six weeks of outflows, the week of April 13th, we saw inflows, although only highly-rated credits had market access. In May, the municipal market rallied to lower yields and started to open up and to more credits as investor demand for bonds began to increase. The strong market tone was retained through June as cash flowing into the market continued to result in robust demand for primary market issuances.

And so what we have seen year-to-date through September is 23 percent higher issuance than in 2019, really breaking the all-time nine-month record since tracking began. And at the first three quarters of the year, muni volume now stands at a 342 billion as compared to 281 billion for the same period in 2019. September, in fact, has been the strongest month for municipal bond issuance. And as compared to issuance during the 2018 crisis, we're seeing slightly higher tax-exempt volume, about 2 billion, but dramatically higher taxable volume at 118 billion higher than we saw in 2018.

And I think, as Brad mentioned, that's largely because of the changes in the Tax Act but also really low taxable rates. We're actually expecting our projection for this year's volume of total issuance to

be about 482 billion. And that would be 116 billion higher than in 2018.

Going to the next page, we show the historical issuance of municipal bonds by tax status since 2009. The municipal market, as you all know, has been dominated by tax-exempt issuance, usually hovers around the 90 percent mark. But here we see that 2020 has been the highest percentage of taxable muni since 2010. And in 2010, we had seen the issuance of Build America Bonds, which were a taxable vehicle that allowed municipalities to access the taxable markets.

In July of this year, 35 percent of municipal issuances was taxable. And again, this is fueled by low taxable rates as well as desired municipalities to advance refund their debt, a mechanism that's no longer permissible on a tax-exempt basis under the 2017 Tax Act. Page 17, you can see taxable municipal bonds totaled 98 billion in total for the first nine months and account for about 30 percent of total issuance in 2020.

On the top of 18, we can see that issuances have been higher in every month this year other than March when we saw the severity of fund outflows, you know, that you see in the bottom chart, which really dominated the landscape for the municipal market. I'm

going to turn now to the Municipal Liquidity Facility. On April 9th, the Federal Reserve announced the MLF as part of a new series of facilities to support the economy.

The facility aimed to ease cash flow pressures on state and local governments as they adjusted to declines in municipal and state revenues and faced greater than expected public health costs due to the pandemic. The MLF was capped at 500 billion for loans up to three years. It was open to counties with populations of 500,000 or more and cities of 250,000 or more.

And in June, the Central Bank allowed U.S. states to be able to have at least two cities or counties eligible to directly issue notes through the MFL -- MLF regardless of population. Going to the next page, on page 20, we can see that there have only been two municipal issuers who have taken advantage of this facility. In June, the State of Illinois, the lowest-rated state at Baa2, BBB- issued 1.2 billion of one-year general obligation-backed notes, which were priced at 366 basis points over the AAA index.

Just as a point of reference, last year, one of the services had the one-year spread for Illinois notes at plus 95, but that does not account for the

size, you know, of this borrowing. So you can see the dramatic difference that the year has made. In August, New York MTA actually solicited bids in the primary market for its 465 million bond anticipation notes and received 20 bids from 10 banks with an average clearing cost of 2.79 percent. But they ultimately rejected those bids and instead accessed the MLF at 1.93 percent.

So what we've seen is the MLF has really -- it was structured as a last resort. And that's exactly the way it's been utilized. The Fed has said the program is meant to be a backstop to help the market function properly. I will say that some issuers would like to see the program extended into next year, perhaps a look at the final maturity being extended and reconsidering the pricing and access parameters, given how low overall interest rates are. Thank you.

MS. MARTIN: Great. Great. Thanks, Suzanne. So, Darryl, you've been in the market. Can you give us just a flavor for what you've seen as an issuer?

MR. STREET: Sure. Happy to do so, Lynn. So the District had the good fortune of timing that we were in the market just prior to a lot of the economic shutdown that happened due to COVID in late February. We came to market with our income tax revenue bond credit. The District is a highly-rated issuer. We have a AAA rating on our GO bonds from Moody's. And so at that time in late February, we were able to sell 25-year debt, tax-exempt, at the lowest all-in borrowing cost I think the District had ever achieved.

Shortly thereafter, though, as Suzanne went through in her remarks, the markets basically froze from mid-March on into April and then slowly started to work themselves out where high-grade issuers such as the District could access the market in April, albeit probably at wider spreads than what we could have done before. The market then continued to work itself out, I believe through the rest of April into May. We then came back into the market with another sale of income tax revenue bonds at roughly $670 million. And at that point, the market had basically come back to normal for high-grade issuers like the District. We sold basically almost on top of in terms of all-in borrowing costs where we were pre-COVID pandemic.

So at that point, we felt that, you know, the District and other high-grade issuers had pretty good access to the market and almost as if everything that happened before didn't exist. I don't think that's necessarily the case. So for some of the lower rated issuers, certain specific credits that might be related to areas that have concerns going forward with revenue

pressures such as transit, airports, things of that nature, which I think we can touch on a little bit later if that's what you'd like to do. Thank you.

MS. MARTIN: Amy, so you've heard a couple times us -- around rating agencies and the impact of rating agencies. What's been your experience from the data that you've looked at, both new issuance, disclosures, whatever the case may be with rating agencies.

MS. McGARRITY: Sure. Thanks, Lynn. I just -- I wanted to just highlight a couple of observations that the Credit Rating Subcommittee has surrounding the municipal markets. Suzanne touched on it a minute ago. But the Municipal Liquidity Facility or MLF was put in place by the Federal Reserve to provide liquidity and funding for essential public services by providing a liquidity backstop to eligible issuers.

In order to be eligible to use the MLF, issuers must have a specified credit rating within a defined range. The rating must be given by two or more eligible NRSROs. As we discussed previously at prior FIMSAC meetings, a component of Dodd-Frank legislation intended to remove references to specific ratings from regulation, though some remain. While I recognize there may not be clear alternatives, especially using the time

frame the Fed operated in during this extraordinary period, the Credit Rating Subcommittee wanted to really underscore this point. We believe a more market-based measure should be incorporated when evaluating the credit risk of an issuer and the resulting funding costs and, in this case, their cost of funding using the MLF.

This is especially relevant during extraordinary macro events, such as the current global pandemic, which will require time for NRSROs to fully understand the ramifications on issuers. And the credit ratings will likely lag market sentiment on credit risk. Scott discussed earlier how the credit market investors favored certain issuers which are less harmed by the pandemic despite their ratings. In the muni market, we have seen some notable issuers downgraded thus far into the pandemic, including a high-profile issuer just last week. The issuer's spreads remain close to where they were prior to the downgrade, indicating that the ratings lagged the market's recognition of the risk in that issuer. Lynn, I'll turn it back to you.

MS. MARTIN: Great. So going forward is clearly a topic we wanted to talk about, particularly since -- given the macroenvironment that we're entering into with Q4, there could be additional volatility. So first, Lee, maybe you could share your observations a

bit further. I know you've talked about the importance of electronic trading. And the fact that you were able to transition folks from an in-office to an electronic trading or an at-home environment really helped facilitate further electronic trading. Is there anything that you'd like to share about what worked well but also if there is anything that didn't work well first?

MR. OLESKY: Yeah. I think -- look. Overall, it went pretty well. I think the infrastructure and the platforms and the getting to work from home functioned incredibly well. I guess maybe a little side point -- which Horace mentioned this. I think it's a really, really good point. And it came up in the credit conversation. Because we have so many more folks connected with each other, it's allowed for new forms of liquidity to reach the end user.

So with respect to the muni markets, we saw, you know, algorithmic firms raising their profile in the crisis period, you know, largely because of their ability to respond to the sheer volume of RFQs because they are willing to warehouse the risk when the market direction quickly turned. And they became a -- you know, a source of -- a great source of liquidity for retail and the buy side. So I think that that was a --

you know, that was a real positive. I -- you know, there was some challenges. And I think that this goes back to what we were saying in the last committee. My only point here would be -- and to the SEC is just to continue to invest in the space because I think it could be made more robust. It will continue to evolve. And I think, you know, it's going to require a kind of constant investment and attention.

But, you know, overall, we thought electronic markets performed incredibly well. They served as a critical forum for liquidity during March and April, you know, despite this unprecedented situation and volatility and work from home.

MS. MARTIN: Yeah, I would agree with that from the ICE bonds perspective as well. The transition from fully in-office environment to work from home and working with our customers was something that was not short of extraordinary. And given the investments in technology, it really facilitated that kind of transition seamlessly.

Suzanne, I know you had some thoughts just about, you know, as we think about the volatility that may occur in the fall as well as, as we -- essentially the move through 2021. What are things that we should be thinking about?

MS. SHANK: Thanks, Lynn. Yes. We anticipate volatility to continue in the fall as municipal issuers really grapple with budgetary distress, which will hinge on news around vaccine developments and other stimulus package passage if there is one with aid to state and local governments.

And of course, if there is any disruption surrounding the election results, we would obviously expect that to contribute to volatility. On page 22, S&P identified some of the key credit drivers for their analysis. The rating agencies have been, you know, pretty active in putting out, you know, their views of what's happening. And they have included as key factors pandemic response, federal stimulus, uneven economic recovery, social unrest, natural disasters, cyber risk, revenue volatility and really municipalities' ability to deal with their fixed costs such as pensions and OPABs.

You know, another issue that we think will continue to get a lot of dialogue in the municipal space will be the increased disclosure vulnerability for issuers because, you know, they are dealing with a lot of unknowns and, as Mark mentioned, there were a lot of disclosures. There were many voluntary disclosures. I think issuers are still grappling with when to disclose, how much to disclose, you know, etc. So Chairman

Clayton's, you know, announcement earlier in the year, I think, prompted issuers to take their disclosure requirements much more seriously.

Another thing that I think we are going to see is really a difference between the haves and the have-nots. Issuers like the District, you know, where Darryl is, you know, are very well-positioned for this. And in general, issuers, you know, were well-positioned going into this, better positioned in 2020 than in 2008. But still those challenged credits that hinge on hospitality and, you know, those more challenged industries we think will continue to, you know, struggle. And that's all I have.

MS. MARTIN: Thanks so much. So that brings to the end of our presentation. But before we turn it back to Michael and the rest of FIMSAC to ask questions, Elisse, we'd love your perspective on, you know, what should we be thinking about since the 2008/2009 crisis that we should keep in mind as we really move through uncharted territories here. Any best practices that we should be keeping in mind particularly for the muni markets would be quite welcome.

MS. WALTER: Well, I must say that -- thank you, Lynn, for the opportunity to give my views. I really believe that all of us who touch this market in

one way, shape or form should be proud of the extent to which the market continues to function smoothly. I do think that we need to continue to keep an eye on market structure to see if there are any changes that should be made in order to have it function even better.

I also think that, in the longer term -- and these are not things that are going to happen overnight -- we need to continue to have an eye on transparency and whether or not there are further routes that should be taken in my mind, particularly with respect to pre-trade transparency to help investors in this market. And I also think -- and, you know, Michael, you can take me off of the comment list because I will say this now rather than later on -- that as we are looking at -- and this is not just with respect to munis. But any kind of fixed income, we're looking at certain types of regulatory disparities between broker-dealers and ATS's.

I think that needs to be expanded because for a long time, I felt that we should really take a careful look at the lines that we're drawing between ATS's and exchanges. And that is obviously more of a long-term project. But I do think that what has happened in the last few years, which is very, very welcome, is a heightened attentiveness by all market participants, including regulators, to things that have happened in the marketplace that are unanticipated. And we all know that, regardless of the fact that this crisis is being met in this particular respect quite well, we need to anticipate the unanticipated. Thanks, Lynn.

MS. MARTIN: Anticipate the unanticipated. That's the theme for 2020, I think.

So, Michael, I'm going to turn it back over to you. That concludes our subcommittee's run-through of what's happened and what we should be thinking about.

MR. HEANEY: Thank you, Lynn. And thank you to all the presenters and the entire subcommittee. Excellent presentation. Important information for both the public and for the rest of FIMSAC. So let me stop here and reach out to FIMSAC members first. Any questions or comments?

I'll open it up to Chairman Clayton and Brett and the commissioners. Questions or comments for Lynn and/or the subcommittee?

MR. REDFEARN: Michael, let me just say once again thank you for another great discussion. Really appreciate all the materials that were put together and all of the input that was provided today. Again, very helpful. I have no questions, but I just wanted to thank the committee.

MR. HEANEY: Thank you, Brett.

Others before we pause?

Okay. Terrific. Thank you, Lynn, again for leading the panel. Thank you to the subcommittee for all the work. It was an important discussion, as I mentioned. And I echo Brett's comments. It's -- we're basically right on time. 12:45 was the intended lunch break. So why don't we break now? I'd ask that all FIMSAC members please stay connected but just mute your audio lines. And we will begin the afternoon session at 1:30. Thank you very much.

(Whereupon, at 12:38 p.m., the meeting was recessed.)

A F T E R N O O N S E S S I O N

MR. HEANEY: Okay. Welcome back, everybody. I'd like to call the meeting to order. I thought it was an excellent morning session, extremely informative, a lot of very useful content. Thanks again to all those involved.

BOND FUND AND ETF MARKET OBSERVATIONS AND LESSONS LEARNED

MR. HEANEY: We'll now turn to the bond fund and ETF market and have them share the analysis of the market volatility and dislocations that they saw in this sector. Ananth Madhavan, chair of the subcommittee, will be leading the discussion.

Ananth, over to you.

MR. MADHAVAN: Thank you, Michael. So once again, we're going to have all of our subcommittee members presenting. I think the order of that will be Rachel Wilson will kick us off. Then we'll turn to an analysis of bond ETF behavior in the crisis, which I will deliver, sharing some of my empirical work. Then we'll turn it over to Kumar Venkataraman for an academic perspective. And Kumar will walk us through some of the academic thinking about funds in general, ETFs and mutual funds. At that point, we'll turn to Robin Foley, who will give us her perspectives from her seat. And then finally we'll close with Amy McGarrity and Lynn Martin concluding this subcommittee's findings. Okay?

So Robin, over to you.

MS. WILSON: I think Rachel; right? So I'll --

MR. MADHAVAN: Oh, sorry. Rachel.

MS. WILSON: That's okay. We've got too many R's now on the subcommittee. It's confusing.

MR. MADHAVAN: Yeah, it was.

MS. WILSON: So, you know, look. Last year, our ETF and Bond Subcommittee did produce a stress market report. And we noted that while bond funds and ETF had generally performed well in stress markets, you

know, we did have to caveat our conclusion because we hadn't yet seen a period of volatility akin to 2009. And at that point, the ETF market was obviously much smaller.

So the COVID crisis in March 2020, it has offered us a unique opportunity to revisit some of this analysis and discussion from last year's report. Some of the stress market ETF risk that we considered included the ability to fund -- excuse me -- the ability of mutual funds to meet redemptions, step away risk from AP and apparent deep discounts to NAV, amongst others.

So today we're going to be re-examining some of these ETF risk themes given the COVID-related stress market experience. Specifically, as Ananth mentioned, we're going to review how the bond ETF market behaved under stress through analysis produced by BlackRock with Ananth and their experience in comparative analysis across some of their flagship funds.

Kumar is going to then present emerging academic themes with a focus on systematic risk. And Robin will discuss anecdotal evidence about the experience of mutual fund managers and investors. Finally, Amy and Lynn are going to summarize our overall assessment and initial conclusion. And with that, I'll turn it back to Ananth to present the BlackRock analysis.

MR. MADHAVAN: Okay. Thanks so much, Rachel. So let me show -- let me share with you a presentation that is based on some work that we did. And this is forthcoming in the Journal of Index Investing. So without further ado, I would just also want to point out that this is work that was done by BlackRock. It has nothing to do with the subcommittee or with the Commission or with any of the commissioners.

Okay. So what do we find? As Rachel pointed out, the stress period is of considerable interest given we haven't really seen anything like that in the last 10 years. So how did fixed-income ETFs do? Well, they actually did -- they did pretty well. And this is calling on some of the themes we heard from the earlier sessions about the muni market and Rick McVey's session general resiliency of the corporate bond market, the muni markets, shift to electronic trading. Some of these themes we'll see in this presentation.

So the first point I want to make is we're going to look at three things. We're going to look at the pricing of fixed-income ETFs, the liquidity of those ETFs, and then the functioning of the arbitrage mechanism. What you'll see on this page on the bottom right is a chart which shows the secondary market volume

in our flagship high-yield bond ETF. And you'll see it's very closely tied to the VIX, volatility index. So there is clearly a relationship between the volumes of these ETFs and volatilities. And that's in keeping with some of the findings earlier today that were reported.

Moving forward a slide -- there we go. Okay. So in terms of price discovery, one of the things that we noted was that during the height of the volatility crisis in March of 2020, there was some pretty severe deviations of price from NAV. And the real question is what's driving those things. There are a few institutional features with NAV that we want to be aware of.

One is that the actual bond NAVs are struck at 3 p.m., not at 4 p.m. when the market closes. So if there is a large price movement in the last hour, as we saw a lot of in those days in March, that could be premiums or discounts to NAV just as a result of the timing differences. NAV is also struck based on previous prices. Some of these bonds that you'll see shortly trade quite infrequently. And as a result, the prices that were recorded may be, in some sense, not actionable. Okay? So were the prices of the bond ETFs -- these are prices that are struck between buyers and sellers on a transparent exchange. These are marketable

prices. These are prices that you can transact at.

So shown on this, we see some of the large absolute deviations in March and April on the bottom left table compared to January and February, the more, quote/unquote, normal period which had much tighter relationship between price and NAV. And these are for the three flagship funds covering the Treasury market, the investment grade market and the high-yield market, respectively.

So on the chart on the right, we see, you know, how that ETF prices actually trapped the most liquid bonds. And again, this is in keeping what we've heard earlier today. Trading gravitates toward the more liquid bonds. And here you see the flagship investment-grade fund, LQD, whose price is shown in red, and then the five largest holdings of LQD, the five bonds, and their prices. And you see that actually the prices of the ETF are right in the middle of the prices of the five top holdings.

So these holdings are trading quite actively. ETF is tracking them quite closely. What explains the large deviations? Well, if we think about the points I made earlier, the ETF prices reflect an actionable trade on the exchange but the NAVs may not. You may not be able to -- for the reasons I just pointed out, be able

to trade at NAV.

And you see here again this -- the top left chart shows you the volatility of prices. And again, we saw this earlier so I won't dwell on it. But I do want to highlight the -- sort of the lack of liquidity in the underlying constituents. And we'll talk about liquidity mismatch in a second. Commissioner Crenshaw referred to that. But you see here the -- a large fraction of the constituents of this ETF do not trade very often. They trade quite infrequently.

So one of the reasons we selected these three ETFs to focus on is because we actually have a better intraday indication from a proprietary model that we've built. And while it's proprietary, we did publish the methodology in the Journal of Trading a few years ago. And so essentially this model takes into account the yield curve, bond-specific yield curve and makes a credit adjustment as well. And though -- and then we adjust the last transaction price or last quote for yield curve movements over the period of time since that last trade occurred. And that's our intrinsic value estimated.

And it's shown in these charts as the -- you know, the top right. You'll see the chart shows you the red line is the intrinsic value or the high-yield fund.

The green line is the NAV, and you can see that's a step function because you get it once a day at the end of the day and usually after the market closes. The point is that the traders and investors don't actually see in real time an intrinsic value because the NAV is only published after trading.

What we see, though, is that the price of the ETF, which is shown in yellow there, tracks the intrinsic value very, very closely. But there are some deviations that are quite sizable from NAV, which is, again -- the better point is that the ETF price reflects more closely the intrinsic value estimator.

Moving ahead, another perspective that we have on NAV is really that, you know, if NAV returns were reflective of actionable prices, then they shouldn't be a serial correlation between today's NAV return and yesterday's NAV return. There is actually that serial dependency, as shown on these charts, which shows that, actually, the past is predicting the future in some sense for NAV. Basically NAV is playing catch-up to the ETF price.

And so we see this in this chart where the ETF price, as I said, is actionable. The price innovation leads to lag. Essentially the ETF is the vehicle of price discovery. NAV eventually converts. And we see

here how that takes place over several days in March.

Let's turn now to liquidity. This is Item No. 2 of our discussion. The average daily volume, you know, in Q1 of 2020 were much greater than the average daily volumes in 2019. Again, that's in keeping with what we've seen earlier today. And you see that also the average primary/secondary volume percentages -- but range from like 9 to 14 percent, you know, in this period, first four months of the year.

Again, what's happening is the majority of trading volume in the secondary market does not spill over to the primary market. So this is a very important point. It means that when there is ETF volume in the secondary market, all that is happening is that ownership of ETF is changing hands, and we're not necessarily seeing that spill over into trading in the underlying bonds themselves.

So -- okay. Then in terms of the liquidity mismatch, let's address that right -- directly. So shown on the left of the chart, which plots the bid-offer spreads in basis points for a number of sub-asset classes of the fixed-income market. And you see that the ETF bid-offer spread's typically one to two basis points. The underlying bids and offers are much larger. I just want to point out on this that the U.S.

Treasury numbers look large. And that's because, actually, the data for this is very long duration off-the-run Treasury bond. So those are actually correct figures but obviously on-the-run shorter duration treasuries have much tighter spreads than shown there.

So is there a liquidity mismatch when you look at the yellow bars versus the red bars? This is what some analysts and some commentators have alluded to. I don't think so. I think the bond ETFs are portfolios of bonds. And because they are portfolios, they are diversified. They are easier to hedge for market maker. And there is no asymmetric information risk, no adverse selection cost with a big portfolio. Therefore, it's quite logical they trade at a tight bid-offer spread.

How has the ETF arbitrage mechanism worked? Well, basically, again, the idea of the authorized participants and other players in the market will buy the undervalued security and sell the overvalued one and thereby self-correcting any deviation of price from an actionable net asset value or action traded. And then this example, I won't go through it, but it's easy to see how the mechanism is self-correcting. Now, there have been a couple of academic theories which suggest that there might be wrong-way arbitrage. And the notion

for this is that in a time of market stress, an authorized participant gets large numbers of sell orders into individual bonds. They have all this inventory on their books, which is toxic. They are willing to unload it. And therefore, they go to an ETF issuer like -- basically dump the bonds into the ETF, get the ETF and sell it in the secondary market, worsening any deviation of price from NAV.

I won't go through the details here. It's in the paper. But we will say that we didn't find any evidence of wrong-way arbitrage. If anything, our arbitrage activity in the crisis was quite muted because transaction costs were so large, again, consistent with everything we've heard earlier today. So in conclusion, three takeaways. One, the bond ETFs serve as vehicles for price discovery. The seemingly large deviations of price from NAV are not actionable, reflected some of the institutional details around NAV with NAV playing catch-up to prices of ETFs.

We secondly note that bonds were -- bond ETFs were more efficient to trade than the underlying bonds. The spreads are much tighter, and there is a logical reason for that. And we saw the secondary market volumes spike up, again, consistent with the resiliency notes from earlier today. And then thirdly, there is no evidence that the primary market actually failed in some way and there was wrong-way arbitrage. If anything, the primary market functioned just fine. And the shares of ETF adjusted as they are supposed to in line with the desired exposure of investors. So with that, I will stop sharing the screen, turn this over to Kumar Venkataraman, who will summarize some of the academic evidence.

Kumar, over to you.

MR. VENKATARAMAN: Thanks, Ananth. Ananth, can you see the screen?

PARTICIPANT: Yes.

MR. MADHAVAN: No, I can't.

MR. VENKATARAMAN: Thank you. Thank you. Good afternoon, everyone. Thank you, Rachel, for introducing our subcommittee and Ananth for the interesting results on ETFs. It is my pleasure to talk about the emerging academic work on bond funds during the COVID stress period. I would like to highlight a few important predictions from finance theory and then share empirical evidence on how these predictions have played out during the March 2020 event.

So first, in line with the SEC's concern, there has been a lot of discussion in the academic literature on the possibility that bond funds

potentially pose a risk to the financial stability of fixed-income markets for the following reasons. The -- there is a significant growth in assets under management by bond mutual funds and ETFs in the last decade, as we know. We -- in a period of low interest rate environment, and research suggests that bond funds have been trying to reach for yields by holding less liquid assets.

Subsequent to the financial crisis, we had post-crisis banking regulation, which reduced the capital by dealers, in particular, bank-affiliated dealers for market-making activities and fixed-income markets. So this leads to the following concern that when there is a large negative shock and investors flee the bond market, it can result in funds selling relatively illiquid assets to meet their redemption needs. And to the extent that their trading happens in a correlated manner, the correlated selling will be disruptive. And it can destabilize markets.

So there is evidence coming from academic research on many of these bullet points highlighted here. And there is also evidence from finance theory that the way in which the bond funds currently are structured, it might have a structural weakness because they are holding illiquid assets, but they promise daily

liquidity to bond investors. So in times of market stress, finance theory predicts that this promise for daily liquidity increases the risk of a run, similar to the more familiar bank run on mutual funds for the following reason.

In the case of bond funds, there is a policy to redeem investors at the end of the day net asset value. But the funds itself do not transact on these redemptions until subsequent days. So the NAVs do not capture the cost of liquidation. Further, funds usually sell their most liquid assets first, making the funds holding less liquid over periods of persistent redemption.

So when you have a shock that persists for a period of time, the risk -- the liquidity risk as -- the liquidation costs get transferred from the redeeming investors to other investors who keep their money in the fund. So in other words, theory predicts that there is a first mover advantage for investors in funds holding illiquid assets. And, therefore, this leads people to exit the fund to avoid being the last set of investors to keep money in the fund. And this potentially amplifies the withdrawal from illiquid funds during periods of stress.

And there is some empirical evidence

suggesting that poor performance of these bond funds leads to large outflows, particularly for funds with illiquid holdings. So the March 2020 period promises to be an interesting event where one can test these theories. Bond funds experienced unprecedented outflows during the period. So the chart on the left-hand side shows the outflows between 2010 and 2020 on a monthly basis.

And in February and March of 2020, the cumulative outflows were about 9 percent of NAV for the average fund. And so a large traction of funds experienced extreme and persistent outflows. And in comparison, during the taper tantrum, June and July of 2013, the cumulative outflows were only 2.2 percent of NAV. So clearly this is a very large shock where bond funds phased outflows. And the chart on the right-hand side shows that there were large outflows in the week prior to March 23rd when the Fed came in with their announcement to support the market.

And subsequent to that, we can see that there is a reversal in the flow. So the study here that I referenced below has looked at the impact of the relationship between these large investor fund outflows and the illiquidity of funds. And it finds that fund illiquidity amplifies fragility, as predicted by theory.

In particular, funds with lower levels of liquidity in their holdings suffered more severe outflows during the COVID-19 crisis than funds with liquid holdings.

Further, investors started to panic earlier in these illiquid funds. And the Fed's announcement of the corporate bond purchases stopped the outflows by calming the market. And in our conversations this morning, Director Redfearn had asked whether there are any important lessons for regulators coming out of the COVID pandemic. In my mind, one lesson that is seen in data is that the fund structure where bond funds promise daily liquidity by holding illiquid assets is prone to investor runs.

The solution to the problem is swing pricing, which mitigates the run dynamics. Swing pricing allows the fund to adjust its NAV to pass on to purchasing or redeeming shareholders the cost incurred from their purchases or sales. And there is academic research using U.K. data that implementing swing pricing helps mitigate redemptions during stress periods.

In the U.S., the SEC amended Rule 22c-1 in 2018, which allowed the fund to -- whose fund is permitted to implement swing pricing. But they are not required to. And I think one piece of evidence coming out of the COVID pandemic is that perhaps swing pricing

might warrant a more careful examination.

The other piece of evidence that has come out of academic research is that safer assets faced larger price disruptions during the March and April pandemic. And the interpretation of this study is that there is a large and persistent selling pressure from bond investors trying to obtain cash. And they do so by selling the safer and more liquid securities, which results in the larger disruption. And prices recover after the Fed announcement to purchase assets.

Following this team of liquid assets facing larger price dislocation, the study shows that investment-grade ETFs are traded at larger discounts to NAV than high-yield ETFs. Some bond ETFs have identical twin mutual funds and similar discounts were absorbed between ETF price and the nearly identical mutual fund NAV.

So this points to a problem where retail investors were transacting nearly identical assets at different prices at the same time, depending on whether they were using a bond ETF or a bond mutual fund to gain exposure. There is also some work asking whether the price patterns that you see in the ETFs represent information or selling pressure. So fundamentals or fundamental information is measured by looking at the

pricing in the CDS market.

And this figure here shows that the -- for investment-grade bonds, movements in bond spreads, as measured in ETF prices, are poorly related to movements in CDS spreads while they are much more aligned across high-yield bonds. So this evidence, as well as other tests, leads the authors to conclude that the large and persistent selling pressure from bond investors trying to obtain cash explains the price patterns that we see in these liquid ETFs.

So with this, I conclude the summary of the academic evidence. It's emerging because more work remains to be done, and academic data sets typically are updated with the delay. So I'm sure that there is going to be more work ahead looking at the event. I have a few questions that came to my mind that I have listed here, first, the new Fed policy.

As a financial stability tool, what are the long-term implications? Secondly, who drove the selling pressure in the bond market? Are these bond funds, insurance companies, etc.? What are the different sources of structural fragilities in the market and how do we fix them? And one of the items that I identified is swing pricing.

And then finally, as Ananth talked about, I

think it's important for us to understand the price discovery in this market, ETFs versus NAVs versus CDS prices and exactly where price discovery occurs across these various asset classes. I think these are all promising areas for future research. Thank you. And with that, I turn it over to Robin, who is going to share her experiences from observations in the mutual fund industry. Thank you.

MS. FOLEY: Thanks very much, Kumar. I unfortunately don't have slides to present but happy to share the actual perspective that we had to complement his academic perspective. So I'm Robin Foley. I'm one of the two bond chief investment officers in the Investment Grade Division at Fidelity. And just as a reminder, these remarks are my own personal opinion and don't reflect the views of the firm. You know, they reflect my -- also views of my participation in the committee, but not on the committee as a whole. You know, I would agree with the prior speakers in terms of, you know, the volatility that we experienced was unprecedented.

And I think our sense was that, you know, the Fed really jumping in to soothe and calm the markets across all asset classes -- as folks will recall, you know, when you have a top-to-bottom downdraft in equity markets of call it 30 or 35 percent, you know, in fixed income and particularly investment grade headed into a quarter end, we expect flows. And so we were already really expecting that before and headed into sort of this quarter.

You know, the rapidly shifting expectations that we had with the global pandemic, I think that just added kind of dislocation in addition to everybody going from home. It just made price discovery that much more challenging. You know, I think as most people are aware, we serve as advisor for not only ETFs but also for mutual funds, in fact, probably better known for mutual funds. And I guess just to jump right to the punchline, you know, in regards to the redemptions that we saw in mutual funds and specifically in investment-grade space, they were very consistent with what the ETF market experienced. You know, it was really a challenging time, again, as I said, to find price discovery that -- price discovery, as Kumar just alluded to.

It actually started in the liquid markets. It started in -- you know, kind of happened all at once but was happening in the most liquid markets, which was really a surprise. And if you put together the mosaic, I think it's a combination of everybody having to be

remote. You know, the DR situation that most were prepared for on the street was kind of New York and New Jersey. And obviously that didn't work.

So started with the liquid markets, moved to agency mortgages, moved to high-quality corporate bonds. You know, as we heard this morning, the -- we're sort of trying to figure out what the pricing impact is of this global pandemic. There was also a dramatic repricing in the energy sector. So you had the second order effect, volatility delivered to us through other markets.

But, you know, mutual funds, we're able to meet the redemptions, you know, that were asked of us even through the quarter end. And as that, you know, backstop liquidity, that was broadcast by the Fed but not really taken up, made its way through the pricing mechanisms of both securities and ETFs. The market has rallied quite a bit and has, you know, equilibrated quite a bit.

You know, for us, I think -- and for this discussion about sort of the functioning of the fixed-income market, we spend a lot of time thinking about what the investment objective and what the expectations are of the shareholders and of the users of these vehicles. One of the things that has changed in the last several years is that bond mutual funds and, I

think, ETFs are experiencing this to some extent, but I'm most familiar with bonds, having been a fund manager for over 25 years, is that the use of funds has grown dramatically to enter, you know, a target date, a multi-asset class or an advisor situation.

So, you know, back -- for those of us who have been in the market for a long time, back when I started, people didn't really understand bonds. I spent many times trying to explain to people the difference between a bond and a bond fund. Now, you know, you fast-forward. I think the thought is that, you know, fixed-income funds are in much stronger hands by being controlled by some of these asset allocators, some of these target date funds and so forth. But it does subject you to larger movements. It's a larger market, but you have larger movements headed into a major rebalancing event.

And so that had a lot to do with, you know, the liquidity we experienced in addition to a flight to quality across all asset classes. You know, tapping of bank lines for companies, people just wanted to have cash on hand just because. And I think shareholders to institutions alike were no different. Everybody just sort of wanted to have that.

You know, in terms of the, you know,

additional opportunity to take advantage of valuations, once, I think, the calm started to settle through, you see it in the new issuance volumes in the corporate bond market. You see it in the flows. Money started to flow back because I think that people understood that, okay, you know, the short-term emergency as we sort of worked our way out of that, you know, it quickly equilibrated. But, you know, in terms of the pricing and the performance, if you look at it relative to ETFs, it was a very similar experience from the bond fund perspective. So I'll just pause there. Happy to take questions at the end of our session. I suspect there will be some. Who do we have next?

MR. HEANEY: Ananth, are you still with us? Or -- and I do see there Amy --

MR. MADHAVAN: Yeah, no.

MR. HEANEY: -- and then you were next. Oh, apologies.

MR. MADHAVAN: I think I was on mute. Turn it over to Amy and Lynn to close then.

MS. MARTIN: Sure. Maybe I'll kick off. So this is a topic that we actually spent a lot of time at ICE Data Services looking at, particularly in the March time frame. Discount and premium to NAV is really a function of differences in the products, the ETF products versus the bond fund products. ETFs have been a fantastic innovation in that they allow a participant to get immediate exposure to a broad range of securities with lower transaction costs. But they function differently than the bond funds do. They are listed on equities platforms. They trade like equities, whereas bond funds don't have the same complexion.

So anytime you can trade a package of securities as a single instrument, that's very different than trading thousands of underlying securities, particularly in a less liquid market like fixed income tends to be. But importantly, as Ananth said, this phenomenon is a function of the underlying markets that they track. In normal markets, you see a pretty tight correlation. But in volatility and volatile markets, you see this difference exacerbated, as you did in March. And this actually is to be expected and something that follows on the liquidity spectrum.

While there has been a variety of topics covered on bond funds, NAV versus ETF NAVs, it is worth noting that one of the most liquid ETF, the S&P 500 SPDRs, also had a 1 percent difference between its NAV and what it was trading at. So, in general, as you progressed through the liquid -- liquidity spectrum, you saw the -- that 1 percent become more pronounced when

you looked at Treasury funds. And then that got more pronounced when you looked at some of the corporate bond funds. And then, in general, the muni funds where it was even more pronounced, again, a function of the underlying markets that they are trading in.

So while exchange-traded securities like equities experienced these dislocations, price transparency results in very fast correction. In fixed income, you have much more complexity, much more complex universe of securities and a more complex market structure. And as you heard this morning, the rise of electronic marketplaces and their associated speed and transparency benefits -- it means that the gulf between the equity and fixed-income ETF will probably shrink long-term, and you will see this phenomena, particularly for funds with the more liquid fixed-income security start to converge even further.

MS. McGARRITY: And I'll just take over from there. Thanks, Lynn, for that. And thanks to my fellow subcommittee members. This has been a really enlightening presentation for me as well. I don't have a lot more to add. I think that my esteemed colleagues have really the market expertise and have really contributed to the conversation.

Just two points I wanted to reiterate. First

off, our subcommittee created a stress market report which was very detailed and offered some thoughts on what we felt were areas of the market that needed further exploration. Fortunately, we have had the opportunity to explore some of that, unfortunately, through a global pandemic. But it did offer us the opportunity to review some of this. And as you heard from Ananth, Kumar and Robin, we have some real-world experience that we can leverage going forward.

I think Kumar makes some relevant points, especially surrounding additional areas for further research that I think the subcommittee would promote as a likely positive outcome that we would like to see additional research done. I think another topic that has also come up on a variety of subcommittee calls that I have participated in is the caveat, the overall caveat that a lot of our conclusions, if you can call them that, are really dependent on the role of the Fed in stabilizing markets.

And the bond and ETF success, so to speak, during this period, I think, was not necessarily predicated on that, but it was definitely influenced by the Fed's actions. And the subcommittee wanted to, I think, reiterate that while we are presenting some, we think, positive conclusions based on the performance of

these products in this market volatility, there is a caveat surrounding the Fed's actions, and we wanted to underscore that. And with that, I will turn it back over to Ananth. Thanks.

MR. MADHAVAN: Thanks, Amy. I'm going to turn it back to Michael to moderate the questions for this --

MR. HEANEY: Thank you.

MR. MADHAVAN: -- subcommittee.

MR. HEANEY: Thank you, Ananth, and thank you all who participated on this panel, and this presentation, again, a very informative presentation for all of us. I will start and open it up broadly. I have not received too many on the question or comments front. So let me just open it up broadly to FIMSAC members for questions or comments.

Let me include Chair Clayton, the commissioners. Any thoughts or questions for the panel members?

MS. THEISEN: Michael, could I ask a question? It's Sonali.

MR. HEANEY: Absolutely, please.

MS. THEISEN: Sorry. I was on mute. Apologies. I think I was on mute. I'd love to ask a question to Ananth or really any of the subcommittee members. That was a really informative presentation.

Thank you so much.

Ananth, I was curious as to your views on sort of how the market -- and I think I mentioned it during our part of the presentation as well, that one week where sort of, you know, the NAV, like discount to premium were like -- about, you know, 10 percent or so on LQD. What was the -- what was sort of the market, like, primary versus secondary complexion? Like what were your observations in terms of how the market traded and what -- you know, what people were looking to do in the market and how that works.

MR. MADHAVAN: Yeah. Great question, Sonali, and let me take that, and then obviously the subcommittee, feel free to jump in to elaborate. So some of the additional color didn't make it into the deck. It's in the white paper, which, as I mentioned, is coming out in the Journal of Index Investing. What we found there was obviously extreme elevation in terms of secondary market trading. The ratio of primary/secondary market trading was obviously, you know, quite -- you know, a fraction. And therefore, most of the secondary market trading was netting off changes in ownership. And some secondary markets served as a safety valve. So if, for example, Larry felt the high-yield market was undervalued and I felt it was

overvalued, I would be selling an ETF, and he might be buying one.

And all of this happening, we're changing ownership of the ETF, but we're not actually trading the physical bonds. And in fact, the physical bonds -- the less liquid bonds sort of locked up. That's what we found in terms of that. And then in terms of your questions about the deep discounts, I do think that, you know, some of the institutional details around NAV are relevant. So the 3 p.m. strike is quite important when prices are moving so much. And that also informs some of the academic research that Kumar cited where, you know, some of those results need to be sort of put into context of some of these 3 p.m. snaps and some of the difficulty in pricing bonds for the pricing providers when these bonds don't trade or trade at sort of seemingly odd prices.

That's why we focused in on the intrinsic volume and generally found that the price -- the ETF price was close to our intrinsic value estimates intraday, which is what ultimately matters for arbitrage. I think if these deviations -- the last point was if these deviations were actionable, then authorized participants and market makers would take advantage of them. And what we actually saw was the

flows tended to go in the right direction, so they tended to respond to the -- positively to the deviation between price and intrinsic value, which is actionable and -- but in a much more muted way.

So I did skip over that one part in the presentation in the interest of time. But it's there in gory detail in the white paper. So the -- that made me conclude that actually the arbitrage mechanism is functional, but the seemingly large opportunities really weren't there, either because the liquidity wasn't there or the transaction costs were too large. So let me stop there and see if the subcommittee has anything else to say on this.

MS. FOLEY: We actually had a similar question at our firm about what constituted primary activity because that primary activity does serve as the arbitrage that equilibrates those two prices, you know, between the NAV of the fund and the share price of the ETF. So that's a great question. But I think the other thing I would say, just unrelated to that, is that I think somebody made the point earlier these are two different instruments. So the ETF instrument and that share, it does trade much more liquid, you know, much more frequently for different reasons. For example, I think that there is a fair amount of the market. And

Ananth, you could jump in here. But I think people use ETFs to transfer risk. Clearly that had to be part of what was happening in March and April where, you know, people are seeking whatever they can to move risk around as valuations are moving very, very quickly.

I don't know that people are -- market makers in particular are going to use shares of mutual funds to transfer risk. It's not an instrument that's easily shorted and things like that because it's not exchange-traded. That's just a small example, that they are, you know, two different instruments that might operate in two different ways.

So, you know, the reasons for the difference between a stated share price and a NAV, the answer is probably something in the middle of diligence on the underlying and liquidity of this vehicle versus the liquidity of the underlying here, which if people actually don't need to tap liquidity for the underlying bonds, they probably, in that kind of a market, would not choose to do so.

MR. VENKATARAMAN: Ananth, if I may add to that -- Sonali, I also think that it will be interesting to further understand what happens in the cross-section of ETFs as well because, you know, we have some ETFs which are extremely liquid where the price impact of trading is very low and clearly they would lead in the price discovery, and they would play an important role in terms of the risk transfer.

But then in the cross-section of ETFs, we also have ETFs which are less actively traded. And those prices, comparing those with the NAVs of equivalent bond funds, I would -- at least my guess would be that an evaluated pricing model that is used by bond funds to come up with the NAV, it's possible that the NAVs of bond funds are perhaps a more efficient price discovery mechanism than the prices of the illiquid ETF. So I think more research needs to be -- I think we need to do more research to understand that further in the case of liquid versus illiquid ETFs as well as the liquidity of the underlying holdings. Thank you.

MS. FOLEY: Well -- and to the extent that ETFs and funds are registered vehicles, they have pricing mechanisms. For example, most fund firms who manage both have a fair value committee. And those types of mechanisms or those types of models, it could be intrinsic value. Could -- you know, there is all number of ways to try to get at that. But we do that every night. So that could be something of researched note.

MR. MADHAVAN: And Michael, back to you.

MR. HEANEY: Thank you, Ananth.

Anyone else, questions or comments? I don't have any incoming currently.

Okay. Ananth, thank you again for leading the panel and to all those who participated on the subcommittee. Very informative. We are --

MR. MADHAVAN: Thank you.

MR. HEANEY: -- scheduled and are right on time at 2:15 to take a break from 2:15 to 2:30 where we'll do our last segment of the day, which is the FIMSAC member observations. I will tell you for just planning purposes, this will not take us an hour and a half, given there is a subset of FIMSAC members who are -- have emailed or been put on the schedule. If you have not done that and care to make observations, please just shoot me an email. But I would offer up that we'll probably be able to adjourn this meeting a little early. All right. We'll meet back at 2:30. I would ask everybody to please stay on the line and just mute.

(A brief recess was taken.)

FIMSAC MEMBER OBSERVATIONS

MR. HEANEY: Okay. Welcome back. We're headed into the final session today which gives members the opportunity to speak about their views regarding the fixed-income markets with a focus on future risks that

the Commission should be aware of and monitor going forward. Each member that's interested in sharing their thoughts would please be limited to five minutes.

Previously, I received several member requests to speak during this section and we'll begin with those members in alphabetical order. If you had not offered up, emailed, originally to do this, please just send me an email, and we will definitely add you to the list. Before we kick off, Chairman Clayton, any thoughts that you would like to share with the group?

CHAIRMAN CLAYTON: Well, thank you, Michael. Two. One is I'm very much looking forward to hearing from the committee members on anything that we here at the Commission should be paying attention to. Also willing to respond to the best of my ability, of course, speaking for myself, any questions that the committee members may have in that regard. So very much look forward to this session and thank you all.

MR. HEANEY: Thank you, Chairman Clayton. With that, may I move to the first FIMSAC member, Dan Allen?

MR. ALLEN: Thanks, Michael. I thought I'd share some of my FIMSAC observations and then a few areas of focus, perhaps, as we look forward. But let me start by thanking Chairman Clayton, Michael, yourself,

and Brett, the SEC staff, the commissioners, as well as my fellow Fixed Income Market Structure Advisory Committee members for their dedication, focus and support in making the last two-and-three-quarters years a success, including a series of some really excellent presentations today.

As been noted several times in the past at our meetings, the U.S. fixed-income markets are unparalleled in their size, importance. And they tend to function extremely well. Our committee and subcommittees have drawn comments and feedback from experts from many disciplines and agendas with an emphasis on identifying opportunities for regulatory improvements, improvements that would lead to increased transparency, efficiency and confidence, which generally correlates as liquidity.

We've discussed and evaluated dozens of potential areas of improvement. And in many cases, we are centered around updating antiquated regulation. In other cases, we are focused on encouraging increased access and transparency of data or to attempt to create a level playing field, as we talked about today, with consistent regulatory oversight. And of course, we have discussed many potential conflicts of interest and offered solutions around potentially how to deal with those. Earlier this year, the financial markets were tested in many ways. And as you saw from today's presentation, there were pockets of dislocation and liquidity, as you would expect. But for the most part -- and, yes, partially as a result of -- as invention, the markets continued to function, and risk continued to transfer. This was particularly encouraging as the world faced extreme uncertainty and transitioned to a work-from-home model where technology and e-trading responded well.

I suspect that we'll reflect in the months and years to come. As we reflect, we'll find that the U.S. fixed-income market structure will have emerged stronger from this unprecedented period. As you heard earlier today, FIMSAC -- we've put forth 16 recommendations to date, more than any of us would have expected for the launch of FIMSAC more than three years ago.

And as we look forward, there is always going to be opportunities for market structure improvement, especially considering the complexity and growth that the fixed-income markets have experienced in recent years. I'm confident that the FIMSAC will continue to find opportunities to make suggestions for regular improvements, increased transparency and disclosures that will ultimately encourage new participants, new sources and mechanisms for risk transfer and increased

liquidity.

I suspect the opportunities for further discussions around many topics that have been raised and some, perhaps, that have not been as we go into the end of the year in Q1 of next year for the committee. Some of those conversations may be around the LIBOR -- transition. It could be around interest rate duration -- interest rate and duration risk. It could be identifying asset/liability mismatches, maybe a result of the quest for yield and a push into less liquid assets in an unprecedented interest rate environment.

It could be around the potential need and role of increased access to real-time data to making strong decisions and perhaps evaluating how regulatory bodies could collaborate on topics such as high-yield investment-grade cash bonds, structured credit, credit indices, credit derivatives, and leveraged bank loans as these instruments and asset classes are increasingly intertwined. I look forward to our future conversations and thank you again.

MR. HEANEY: Thank you very much, Dan.

Larry Harris?

MR. HARRIS: Thank you, Michael.

Thank you, Chairman Clayton, for my appointment to FIMSAC. It's been a very rewarding

assignment. I feel that I've had an opportunity to contribute. And I think that we've done pretty good work.

FIMSAC has done good work, but it hasn't addressed many of the most important current issues concerning secondary trading in the bond markets. Markets are becoming increasing electronic. Electronic exchange systems, brokerage systems, dealing systems are changing how we now trade bonds. And they are also changing how we will trade bonds.

These electronic systems have reduced operational costs for everyone. They reduce the cost of accessing the markets, the costs of managing counterparty risk and of managing inventory risk. These cost reductions, of course, allow business to be done in different ways from the past. And I think it's very important that we make sure that the opportunities that electronic trading can bring to the markets are fully exploited.

So to that end, I have six points that I want to bring to the attention of the Commission and others. I think that there should be some sort of trade-through protection for electronically-accessible quotes. So the benefit of that is twofold. First of all, it gives people a reward for offering liquidity. If you put out

a quote but people ignore you and trade through you on a regular basis, you're not going to do that in the future.

But if you put out the best price out there and people hit it, then that gives a lot of encouragement to other people to do the same. It also ensures that there is best execution for clients. Everybody I've met through FIMSAC are super honorable people who I believe work very hard to provide best execution for their clients. But my experience from the time I served at the SEC as chief economist from before and, unfortunately, often after is that not everybody is actually looking out for their clients.

Unfortunately, requires that somebody do so because the information requirements are looking out for yourself, especially among people who are unsophisticated or just too difficult for people to manage. And so we look to the SEC for that. The second thing I would suggest is that riskless principal trades should be regulated as the agency trades that they are. Historically, our markets have developed around principal trading. But now, increasingly, there is a lot of trading is being done on agency basis. Agency brokers should obtain best execution, as we expect them to, for an upfront stated price. We currently have markups instead of commissions. And those markups are not displayed upfront so people can't shop on price. And service, as I mentioned before, is very hard for them to evaluate in the absence of ex-ante information, which is my next point.

So better ex-ante transparency would improve the markets. An NBBO that would allow best execution -- would allow best execution to be regulated. Best execution, especially for small trades, can't effectively be regulated without some reference to price. So without knowing what the prices are, we just have to sort of take it at faith that people are making strong efforts to get best execution. And I believe that most people are. But I'm also aware that, too often, people don't. And it's the too often that people don't that is what ultimately established the SEC on its mission.

Also, best ex-ante prices will allow the buy side to negotiate better prices on a more even footing. That's well understood. It's unclear to me why we wouldn't allow people to know prices in the same way as we do in our other markets. So, for instance, option markets or currencies or the treasuries or, of course, the equities as well.

And finally, best -- better ex-ante prices

will allow bond funds to be priced more accurately, which is really important for investment management and investment management companies. Last three points. Reference data is a -- is, frankly, a corporate finance issue, not a FIMSAC issue. It should be addressed through EDGAR. EDGAR is a system that we use to display, make more transparent, all sorts of information about issuers.

You cannot value the equity of an issuer without knowing the -- its liabilities. And to know its liabilities, you have to have reference data about the bonds that they've issued. So this is not really a trading issue. We addressed it as a trading issue. But it's really a disclosure issue. And it should be taken up by corporate finance.

Next two points, these are very, very important but perhaps the most difficult. We need to figure out how to encourage municipalities to deliver timely financials. We don't regulate that area, but we do regulate entities that they interact with. And perhaps by squeezing those entities or focusing their attention in some way, we can get more timely financials. That will be good for the secondary trading of municipalities, municipal bonds, and also for primary trading in those securities. Frankly, it will also be

extraordinarily good for the citizens of those municipalities.

And finally, I'd like us to think carefully about how to encourage issuers to issue fewer securities. There are an awful lot of bonds in the market. And because there are so many bonds, it complicates how we trade them. Fortunately, electronic systems greatly ease those complications. And we should exploit those electronic systems. Things that seemed like they were impossible before are now possible because we have electronic systems.

But all that said, all issues would trade better if they were larger issues in which interest was more concentrated. So it would be useful for FIMSAC or for the Commission or others to think carefully about what are the impediments to reopening a bond issue or to simply making the bond ladder a little more discreet with the hope the bond issues would be bigger. So bond markets in the United States now operate very well. But they could operate better. The fact that they operate very well should not keep us from trying to make them operate better.

Final comment. Dealers and others resist changes often because they fear that they are going to lose business. And of course not all dealers resist

changes. But history consistently shows that when -- the volumes expand considerably when costs fall. And in particular, the price times fee basically or the price times transaction cost is roughly constant through time, which suggests that people are willing to spend a certain amount for transaction services.

The greater volumes imply greater liquidity. And that's good for economy and it's good for issuers. So I strongly encourage us and the Commission to get down to work on these issues. Thanks so much.

MR. HEANEY: Thank you, Larry.

Mark Kim?

MR. KIM: Thank you. Good afternoon, Chairman Clayton, SEC commissioners, Commission staff, FIMSAC Chair Heaney and fellow FIMSAC colleagues. On behalf of the MSRB, I thank you for this opportunity to share the views of the board on risks in the municipal securities market. As we have seen from the panel presentations this morning, the pandemic caused a significant dislocation in the municipal securities market. During this past March and early April, many state and local government issuers did not have access to the primary market. And liquidity was scarce due primarily to mutual fund outflows.

Secondary market trading in March spiked to levels not seen since the financial crisis of '08 and '09. Fortunately, the dislocation was relatively shortly and the muni market showed its resilience in the following months. Liquidity from mutual fund inflows returned to the primary market with issuance volumes and secondary market trading in the months of May and June returning to closer to historical levels.

However, there is one significant risk that the board would like to take this opportunity to share with the Commission. And that is the risk of credit quality in the municipal securities market. With the pandemic continuing to dampen economic activity across the country, state and local governments are facing increasing financial pressure and reduced tax revenues. As we all know, these are the very same tax revenues that support the repayment of most municipal bonds.

The board is monitoring the ongoing impact of the pandemic on state and local governments' revenues and their continued ability to make timely payments of principal and interest on their muni bond issues. In our current low interest rate environment and subsequent spread compression across all rating categories of bonds, it remains challenging for investors to fully evaluate and price credit risk in the municipal securities market. This is especially true for Main

Street or retail investors who remained an important part of the buyer base for municipal bonds. The board's response to this risk has been to provide the market and investors with greater transparency.

We are leveraging technology to analyze the continuing disclosures and event notices submitted by issuers that disclose material information about the impacts of the pandemic on their operations and finances. We applaud your efforts, Chair Clayton, and the efforts of the Office of Municipal Securities to draw attention to the broader issue of disclosure in the municipal securities market. And we applaud the efforts of state and local government issuers to address this risk by providing the market with more timely and more complete information about the impacts of this pandemic on their finances and operations.

In conclusion, the municipal securities market has proven itself to be resilient in the face of external shocks. But as we all know, markets don't like surprises. And as this pandemic continues to add complexity and uncertainty to the economic outlook of state and local economies, the risk of an unexpected or a sudden deterioration in credit quality in the municipal securities market could undermine investor confidence. Again, thank you for this opportunity to

share the views of the MSRB with you.

MR. HEANEY: Thank you, Mark.

CHAIRMAN CLAYTON: Michael, if I could jump in, I just --

MR. HEANEY: Yes, please.

CHAIRMAN CLAYTON: Yeah. I just want to say, Mark, I couldn't agree more. I think this goes to the point -- one of the points Larry was making, the need for transparency here and the recognition that municipal credit is probably going to have a greater dispersion, nonuniformity, whatever you want to call it that it has at any time in the past. We should recognize that. Investors should recognize that. Financial intermediaries should recognize that and do their homework, particularly in the retail space. But it all starts with good disclosure. So to the extent you can continue to emphasize that message, please do, and we'll try to do so here.

MR. KIM: Thank you.

MR. HEANEY: Thank you, Chairman Clayton.

Lynn Martin?

MS. MARTIN: Thank you again to Chair Clayton, SEC commissioners and staff, Michael and my fellow subcommittee and committee members for the opportunity to participate in today's FIMSAC meeting. I

particularly appreciate this opportunity to share ICE Data Services' views on fixed-income markets.

I'd like to focus my remarks on a few themes that, as I see it, traverse the range of issues that we've covered today. The events of 2020 highlight the need for a fixed-income market structure that, one, supports liquidity provisions during times of stress; two, provides flexibility for contending with extreme volatility in those markets; and, three, preferences a transparent and competitive landscape. These three elements are critical to achieving high market quality by bringing together committed liquidity providers with a variety of liquidity-seeking investors that have diverse investment goals and time horizons.

This becomes increasingly important but unfortunately increasingly challenging in today's fixed-income marketplace where traditional trading venues are not always subject to the same regulatory regime as other venues. In March, mid-March, 2020 as both the scope of the COVID-19 pandemic and the duration of its effects became apparent, the fixed-income markets around the world entered a period of turmoil, as we heard today. Despite relatively stable trading volumes, a sharp widening of bid-ask spreads along with a significant uptick in volatility evidenced a notable deterioration in market quality conditions for U.S. corporate and muni bonds, especially during the latter three-quarters of March 2020.

As we showed during our presentation on the Muni Bond Subcommittee, we at ICE Data Services regularly look at liquidity performance of portfolios, such as our index constituents over time using constant assumptions. Virtually all asset classes across all regions that we observe show degradation in liquidity throughout the pandemic. Interestingly, notwithstanding that most asset classes started that degradation at the same time in the second week of March, we observed different time frames for recovery.

For example, we observed decreased liquidity ranging from the end of March for certain asset classes and regions to other asset classes, for example, high-yield corporate bonds with degradation lasting through April. Many asset classes saw their worst liquidation between March 23rd and March 25th. We believe the Fed's purchase program's facilities help to stabilize the markets quite rapidly relative to prior instances of market stress.

The Fed and SEC's intervention to stabilize markets generally has the desired effect coming into the last week of March and early April as liquidity

conditions eased considerably, though at a different pace for different sectors, understandably. Our indicators pointed to a somewhat accelerated reduction in both transaction costs and market volatility in municipal bonds compared to these same metrics for corporate bonds.

The ability to guard against volatility extends to all parts of the fixed-income ecosystem. In addition to the support provided by regulators over the last three months, it's important to recognize the efforts of all parts of the market in seeking to limit the contagion effect of COVID-19 on the markets.

A good example of this is the instance of which the index providers decided to postpone rebalancing of fixed-income and later equity indices so as not to exacerbate the effects of an already stressed market following market consultation. In March, ICE Data Indices made the decision, after an extensive consultation with stakeholders, pursuant to our consultation policy, to postpone the rebalancing of our own indices for bond, preferred and convertible securities that were due to rebalance on March 31, 2020.

Our decision and those of other index providers helped investors to avoid potential losses during the extreme periods of market stress. As the

FIMSAC and the Commission consider market quality and market structure in the fixed-income markets, promoting a transparent and competitive landscape must be a primary focus. An example that I'd like to use to emphasize this point has little to do with the market events of 2020 but is representative of a fixed-income market structure dynamic that is ripe for change and one that Larry just briefly touched on.

Today, the corporate bond market lacks consolidated new issuer reference data that's made available to all market participants on fair and equal terms. Without this data, market participants are limited in their ability to trade clear and settle corporate bonds when those bonds first come to market. Today, the private data vendors that provide corporate bond new issue reference data are free of any obligation to justify their pricing and are free to reuse -- to refuse to license or withhold it for any reason.

To address this, in 2019, FIMSAC unanimously recommended that FINRA provide a centralized regulated corporate bond new issue reference data service. Following FIMSAC's recommendation, FINRA filed a proposed rule with the Commission to provide a corporate bond new issue reference data service as a public utility subject to SRO obligations. After a lengthy

rule-making process, the Commission approved FINRA's proposal. That was promptly appealed. And the decision -- and seeks -- the decision is currently further to -- subject to further delay. Sorry. It's been a long day.

Accordingly, the SEC has stayed the approval of FINRA's new issue reference data service. Centralized data reporting system for new issues will benefit the industry and investors by enhancing market transparency, potentially aiding liquidity, reducing transaction costs and lowering the cost of capital for issuers.

In addition, timely dissemination of reference data will help improve the timeliness and accuracy of benchmark indices that seek to measure these markets and improve consistency across different market indices. ICE Data Services continues to strongly support FINRA's proposed rule to establish uniform reporting and dissemination.

A key catchphrase of 2020, as you heard earlier, is that we are living in unprecedented times. That phrase holds true for our fixed-income markets where we have experienced unprecedented volatility swings, liquidity stress and day-to-day political uncertainty. I urge my fellow committee members and the Commission to take the lessons learned from 2020 to heart and to use them to guide future policy-making that's grounded in transparency, competition and protecting our fixed-income markets from the next crisis. Thank you.

MR. HEANEY: Thank you, Lynn.

Lee Olesky?

MR. OLESKY: Thanks. Thank you, Chairman Clayton, commissioners, the Commission, FIMSAC committee members and Mike, our chair. The pandemic forced the marketplace to react and disperse quickly and all at once. At TradeWeb, we focused on keeping our people safe, first and foremost, helping our clients find liquidity and move risk and get set up to work from home.

We were able to get our own people and systems switched online very quickly and immediately help clients with their own challenges. As TradeWeb moved virtual in a matter of days in March and market participants all went home or to their remote business sites, in March, we had well over 100,000 users log on to TradeWeb to trade. That's an all-time high for us and pretty extraordinary testament to the importance of electronic trading and networks such as TradeWeb's. The priorities for our clients evolved from ensuring reliable connectivity as client operations dispersed to

work from home to making sure they had access to data, obviously execution and post-trade workflows.

We think the marketplace, on the whole, responded well and quickly and that electronic trading played a meaningful part in helping the markets respond. This all does highlight the importance of e-trading at a time when e-trading was accelerating on its own. That really was clear even before the pandemic hit. The volatility, though, that we saw in March that drove volumes through the roof, I mean, we were averaging over a trillion per day in volumes plus the work-from-home situation, I think, just further accentuates this point.

A couple of interesting trends in work from home. You know, today's -- today we talked about corporates. We talked about munis. But at TradeWeb, we set volumes in -- volume records in every single asset class that we're in, even those that typically don't trade a lot electronically. So some markets are close to being fully electronic. Others are -- trades occur on the phone and get digitized. Others are using machine learning to identify the right counterparty or digitizing the post-trade workflow. But we do think everything is moving digital. And we think the -- it's increasingly clear that clients need links across markets so to Treasury markets, to ETF markets,

to OTC derivative markets in order to have a complete set of tools to trade in times of stress.

Work from home highlighted the need of all the trade lifecycle personnel needing access to this. It's not just about working the traders. It was also about clients, compliance, risk officers, a variety of different participants in the market. In terms of the depth of engagement, clients really did deepen their use of technology, the things that they might not have used before, tools that are new to the marketplace like portfolio trading where you can trade up to 800 bonds in one shot or net spotting that links a live Treasury market to the credit markets.

These things started to really take hold in the real crucible of the crisis in March and now have accelerated. So in terms of, you know, sort of final observation, as we learned today, the market disruption was brutal, but it was relatively brief given the scope and length of the pandemic. A few reasons for that. I think the most obvious one everyone acknowledges was the Fed's quick action and intervention which was really essential to stabilizing the markets in the middle of March. I think the second is advancements in electronic trading and connectivity and video conferencing. You know, a disruption like this would not have been

possible to deal with 10, 15 years ago, maybe even five years ago.

And what we saw in this moment of most stress was the technology was up for it. We really had no systemic issues. And the whole infrastructure worked incredibly well. So from a connectivity and workflow solution perspective, today's marketplace has much more at their disposal than they've had previously. And I think market participants are leveraging it.

Connectivity, business continuity really are quite robust. The proof is in the pudding here. Market participants availed themselves of data that they didn't have access to before, a number of tech solutions, innovative solutions, all-to-all trading, portfolio trading, spotting trading, and in some areas, the muni market in particular, I was a bit surprised at the amount of algo trading for purposes of liquidity that actually occurred.

So, you know, this is the first time you saw algo trading really providing a tremendous amount of liquidity to the market right to retail, which I thought was very interesting. So work from home was challenging but, so far, it's gone well. I think that the marketplace responded quite well to the crisis.

But it does remain critical for market

participants to continue to invest in workflow solutions to mitigate operational risks, particularly given the fact that we are not out of 2020 yet, nor are we out of the scope of the entire pandemic. So I think there is still a ways to go here, as we would all acknowledge. So we need to continue to invest in this type of technology, in this type of connectivity and the types of tools that are available to the market today. That's all I have on that.

MR. HEANEY: Thank you, Lee.

MR. OLESKY: Yup.

CHAIRMAN CLAYTON: Michael, could I jump in there, just --

MR. HEANEY: Of course.

CHAIRMAN CLAYTON: Let me jump in and also say I welcome Brett's comments in this regard. First, Lee, I think that was a nice summary of the various elements of the response from the official sector. On the Fed action and the -- as people have said that, I think that something that is not often said that needs to be recognized is the Fed's action was multifaceted, many points in the marketplace, not just a -- not just the Treasury market but across the board. And I think that that was prescient and quite effective.

On the connectivity, I could not agree more.

I often say if this happened a decade ago, we would be in a much, much different place. What we at the Commission greatly appreciate is that private sector was very candid with us on their connectivity capabilities, on the risks they saw and how they overcame them, which gave us what I would say is the confidence to continue to monitor and take more targeted action than we might otherwise have done. And that dialogue around systems integrity, systems resilience was quite helpful.

You know, my job is not fiscal policy, but I will also note, in addition to the Fed action, we do believe that stabilizing the consumer, stabilizing housing prices, gave confidence to the market as well. And I'd be happy to comment further on this, but, Brett, you were right there at the tip of the spear as we were working through operational issues. Maybe you have something to add.

MR. REDFEARN: Trying to unmute. Can you hear me?

MR. HEANEY: Yes.

MR. REDFEARN: Okay. No. I think that's right. And I think -- I really appreciate this discussion and those comments as well. And it really has been a testament to the resiliency of our marketplace and, in particular, you know, the way that

electronic markets stood up and met the need during that challenging time is pretty remarkable. I think I would just simply echo something that the chairman pointed out earlier, which is this -- you know, along with, you know, the recent proposal to extend Reg ATS and SCI to treasuries and government securities, this concept release. So we did issue a concept release on the electronic corporate bond and municipal securities market.

This is a way for us to get additional information about these sorts of issues. And so I would just echo that, Chairman, and suggests that, you know, people -- to the extent that you can engage in that, that would be very helpful for us taking this to the next level.

CHAIRMAN CLAYTON: Great.

MR. HEANEY: Thank you, Chairman Clayton.

Thank you, Brett.

Ola Persson?

MR. PERSSON: Thank you, Michael. And before I start, I'd just like to briefly acknowledge that I'm filling -- today after -- summer. I obviously wish the circumstances were very different but I'm honored to fill in and to contribute to the committee in any which way I can. First I just want to start by commending the

SEC for convening FIMSAC to review the structural elements in the bond market and the issues that are unique to the fixed-income markets and the implications of those developments for participants and regulators.

FINRA's TRACE initiative was launched in 2002. Since then, obviously major effects on the corporate bond market, structure and trading have changed dramatically. Those changes affect existing infrastructure like TRACE. But they also do prompt questions around potentially new regulatory framework that we should consider.

It is imperative that the regulatory structure -- while still allowing for continued development and innovation where it's appropriate. The SEC has convened FIMSAC at a time that allows for these changes to be assessed and discussed at a critical juncture. And the committee and the various subcommittees have very effectively highlighted areas and proposed either solutions or suggestions for further research and analysis to help consider ways that the regulatory framework can better match today's market.

As to the focus going forward, the discussions at FIMSAC and the proposals that have been presented have provided us in the regulatory community with a roadmap. Practices in electronic trading have evolved significantly, as was discussed this morning. And the SEC also, as you mentioned, just published a concept release to further explore this topic.

Technology and product innovation has enabled market practices that may benefit from further analysis and review and potentially regulation. And transparency is an integral part of the market and could be further enhanced to provide additional granularity and to potentially expand in areas beyond traditional transaction information.

Before I finish up, I just want to return to TRACE for a brief second. There were really three main reasons why TRACE was established now almost two decades ago. The first was to provide a foundation for an audit trail that regulators could use for market surveillance to detect fraud or manipulation or other behaviors that was causing customer harm.

The second was to provide a foundation of knowledge about market function to inform policy decisions. And the third was to make the information available to all participants to level the playing field, enhance price discovery and allow investors to judge the quality of the execution. It's great to see that almost two decades later, it's -- however, as been highlighted by the discussions and all the proposals

from FIMSAC, much still remains to be done. As we discussed this morning and in prior FIMSAC meeting, enhancements are needed to ensure that the data that's being captured provide an accurate and complete picture of the market function. We still need to keep enhancing the regulatory audit trail. And we need to keep enhancing the transparency that is available to market participants.

With that, I want to again thank the Commission for underscoring the importance of the fixed-income markets by convening FIMSAC. And I want to sincerely thank all the FIMSAC members who dedicated their time and expertise to provide direction and suggestions to us in the regulatory community. And this will allow for continuing market development and further innovation while, at the same time, protect investors and ensure the integrity of the markets. Thank you, Michael.

MR. HEANEY: Thank you very much, Ola.

Sonali Theisen?

MS. THEISEN: Great. Thank you very much. First, I want to echo my sincere gratitude to Chairman Clayton and the Commission and to you, Michael, for selecting me to participate in FIMSAC. It's really been an honor. And I've just -- I've learned such a

phenomenal amount from my fellow FIMSAC committee members and subject matter experts and from the SEC staff. So thank you again for this opportunity.

I'm really astonished by the breadth and depth of the recommendations that the subcommittee prepared and voted on during, you know, the last two-and-three-quarter years. I really think that every single topic that we unpacked was worthy of examination and deliberation. And whether or not every single recommendation ultimately is, you know, enacted right now or has sowed the seeds for revisiting and discussion and debate in the marketplace, I think it's been such a great process.

And having been involved in, you know, many of the deliberations, I think it was so healthy to have really vigorous debate and also draft of each of these things before, you know, most of these recommendations came to vote. I think that was very forward-thinking and really important for the future of this changing landscape of fixed-income markets.

When I kind of think about the recommendations that we've put forward, I would loosely bucket them into sort of three buckets. You know, some were, I would say, more reasonably straightforward, being like, you know, just good practices, good hygiene such as, you

know, e-trading best practices and ETF disclosures. Some tackled, you know, fairly complex issues that were, you know, worthy of considering and deliberating that could directly impact market behavior such as the first, you know, trade transparency rules as well as the rating agency framework.

And then some, I think, tackled, you know, topics that were easier conceptually but had, perhaps, existing regulatory or practical complexities such as the municipal disclosures of recommendation and also, you know, today's e-trading -- recommendation. So I think, you know, all of those three buckets are very important. And I'm really glad that we were able to, you know, delve into all of these areas and not just stick with what was, you know, really, really easy to tackle.

I want to take a few minutes just to talk about TRACE, as we obviously spent, you know, a lot of time on the topic in both subcommittees that I was involved in. And I think one of the, you know -- we've even seen in today's presentations but ongoing since the inception of TRACE, I think one of the most important things to recognize is that market conditions do and will change over time. Sometimes, you know, it's episodic. And then sometimes it's longer and more structural.

And I hope that the SEC's work around TRACE as well as FINRA's work will continue to examine, you know, the role of TRACE going forward and think about, you know, transparency regimes that are flexible to accommodate the structural changes and dynamics in the market while being, you know, responsive to more episodic issues. And I would note that I think, you know, there will never be market consensus, I don't think, on, you know, one proposal framework but I think a guiding principle for evaluation of transparency, I think one would be that -- you know, that any recommendations are supported by data.

Two would be that they have, you know, clear relevance and importance to the market to address. And three is simply, you know, that it makes the market easier to understand for anyone. And in that vein, on that last point, I think, you know, some of the more recent recommendations that we've had around, you know, tagging 3 p.m. spot trades and identifying portfolios as well as today's recommendation around harmonizing, you know, e-trading oversight so that electronic trades could be better understood, I view those types of improvements as foundational sort of low-hanging fruit. And I would encourage the SEC to continue to deliberate

on these proposals and see that they are implemented in a logical and cost-effective way to the market because I do think that they would benefit the entire industry.

I know that, you know, the charter for FIMSAC is coming to a close. But I recognize that, you know, we do still have one meeting. And as Dan mentioned, I think one of the topics that is very important and upcoming for the market, the entire market, is LIBOR transition. You know, I also wear that hat for my firm and serve, you know, on the -- on Fed's ARRC Committee. And I think, you know, as this massive industry change approaches, the impact is not solely on rates or consumer products. You know, there is implications across the board or derivative. There is implications across the board, including for credit.

You know, this will impact borrowers, lenders, investors. And I think that it's -- you know, it's very important for us to think about, you know, what role -- this is a markets issue that will be occurring. And I think it's important for us to really consider particularly the credit-sensitive component to an adjustment to SOFR and how the FIMSAC Committee could sort of help guide this. There is obviously a lot of work being done on this topic already by the Credit Sensitive Group that -- you know, that's being run by

the Fed and the OTC.

But I think that this would be an important topic for us to consider examining as a follow-on to the last LIBOR panel that we had at one of our prior meetings. And just as a wrap-up, I guess, I would come back to some of my first comments in my first FIMSAC presentation when I was invited as a guest speaker before coming -- becoming a member. And in that presentation, you know, I noted some of the key structural differences between equities and corporate bond markets and specifically, you know, characteristics of liquid order-driven markets versus negotiated markets.

And I think fundamentally it behooves us to always remember that corporate bond markets are not structurally conducive today to continue its liquidity in any meaningful size because of the market structure that I had spoken about in that presentation. And I certainly respect it and enjoy working with Larry, Larry Harris. I think it's tons and tons of great points. But I personally think that concepts such as, you know, NBBO and trade -- that are more suited towards the equity market that the corporate bond markets are really not there yet and don't have the continuous liquidity that would support those types of rules. And I do think

that the focus should remain, as Lee alluded to, on creating robust, you know, frameworks, you know, making sure that the market, you know, safety and soundness works and then also having, you know, transparency improvements to TRACE that allow for liquidity provision and continued evolution. So thank you.

MR. HEANEY: Thank you, Sonali.

CHAIRMAN CLAYTON: Michael, do you mind if I just make one comment there?

MR. HEANEY: Yes, please.

CHAIRMAN CLAYTON: We talked about measuring the effectiveness of this group in terms of number of proposals. But there has been many other areas of effectiveness. And I want to note that the meeting you had regarding LIBOR, issues around legacy LIBOR and credit-sensitive rates -- I think it must have been 18 months ago -- was -- certainly affected my thinking, but I think it affected thinking across various participants in this issue. And thank you for that. You should feel good about that. And I think you should think about having a follow-up for certainly your last scheduled meeting. So I agree with that.

MR. HEANEY: Thank you, Chairman Clayton. Kumar Venkataraman?

MR. VENKATARAMAN: Good afternoon, Chairman

Clayton, SEC commissioners. Thank you, Michael, and SEC staff for giving me this opportunity to share my idea. I'd like to focus on one idea that I believe has the potential to improve the liquidity and resiliency of bond markets. As we know, the majority of transactions in the fixed-income market, particularly the corporate bond market, are intermediated by bank-affiliated dealers. This is true both in OTC transactions as well as electronic transactions in RFQ platforms where, again, dealers tend to be the counterparties who participate and provide liquidity.

And in the last decade, in response to banking-related regulation, that forced banks to reduce balance sheet risk. The bank-affiliated dealers have reduced the capital that they can commit to market-making activities. And so there is dependence on bank capital for trade intermediation services, increases the fragility risk of the bond markets. And so the bond market will benefit from liquidity supplied from nontraditional participants. This is an idea that Larry briefly touched on earlier this morning. And I was very glad to hear similar empirical support for it from Brad and Horace when they talked about the municipal market as well as from Sonali, Rick and Lee when we talked about the corporate bond trading during

the COVID pandemic.

There is new academic research looking at a longer time period, including a co-authored study that I have recently published which suggests that buy-side institutions are just mutual funds representing potential liquidity source in bond markets. These mutual funds view liquidity supply as a strategic strategy to own portfolio alpha. And funds that invest in liquidity-supplying strategies tend to outperform their competitor funds.

However, unlike equities which trade on exchanges, the OTC structure of bond markets makes it challenging for institutions to efficiently supply liquidity. And as institutions represent the predominant share of bond investor base, the economic importance of buy-side liquidity provision cannot be overstated. So to tap into and further encourage this channel of liquidity supply, we need to further examine the current market structure and remove frictions that impede broad participation and liquidity provision.

Improvements and protocols that offer investors with direct access to trading platforms and the ability of institutions and retail investors to post limit orders are examples of design changes that have the ability to increase supply from nontraditional

market participants and reduce the fragility risk of bond markets. Thank you.

MR. HEANEY: Thank you, Kumar.

Gilbert Garcia?

MR. GARCIA: Thank you. First of all, let me just say I've had a blast. I've had an absolute blast being part of this committee. And I just got to say I cannot stress how big an honor it is for a boutique firm like ours, a Hispanic-owned firm like ours, to really be part of this whole effort. And hopefully in some small way, we've done our part to demonstrate that minority-owned firms, they can hold their own and, in fact, they have a lot to offer in all these important discussions.

And during a crisis, government policy and intervention seems to focus on speed. And I get it. Speed is important. But I urge the commissioners to also look at other things and some unintended consequences because big firms in these times could beget even bigger firms. And I think in today's society, it behooves us all that more than ever, we need to be sure that smaller firms, boutique firms, minority-owned firms survive, they participate and they even thrive.

And so that's what I want to leave everyone

here. I just cannot thank Chairman Clayton enough for believing in me, all the commissioners, of course, Michael Heaney, all the staff. And I cannot forget my original champion, which was Commissioner Kara Stein, who really brought me here to this FIMSAC Committee. So I thank you all. And I know I made my dad proud.

MR. HEANEY: Thank you very much, Gilbert. Did I inadvertently omit anybody who was looking to --

CHAIRMAN CLAYTON: While you're looking, Michael, I just want to thank Gilbert for everything, all the substance and all of the enthusiasm. Thank you, Gilbert.

MR. TABB: Michael, can I add something?

MR. HEANEY: Sure. Larry Tabb and then Elisse.

MR. TABB: Yeah. Brett, can you talk for a minute about how we can help you with this concept release and a little bit about the concept release?

MR. HEANEY: Who was that targeted to? I'm sorry, Larry. I missed it.

MR. TABB: Brett Redfearn or anyone at the Commission, the new concept release on ATS's and government and corporate and securities. I think --

MR. HEANEY: Brett, are you --

MR. TABB: Do you want to go ahead, Brett?

I think we lost him maybe.
MR. HEANEY: He's just texted me. System issue. He's having trouble unmuting at this moment. So why don't -- can I do this? Let's go to Elisse. And then we'll come back to that when Brett is back, able to unmute.
CHAIRMAN CLAYTON: Yeah, and if he's not back, I'll take it, then. But let's go to Elisse.
MR. HEANEY: Okay. Thank you. Elisse?
MS. WALTER: I just want to echo a lot of what's already been said. First, I think that this committee has really accomplished a lot. I've learned a lot from the participants. There is an extraordinary amount of expertise when all of these folks get together. And I think Chairman Clayton and the Commission staff should be congratulated for beginning -- and I do want to stress beginning to give the fixed-income markets the attention that they deserve. I know that whenever it is, this committee is going to draw to a close. But I think it's quite important that the Commission continue to apply its focus to the fixed-income markets.
I agree with a lot of my colleagues on the committee about issues that have yet to be discussed. I also do think we need to come back once again to the

conundrum of credit ratings, particularly in connection with what they mean in the municipal securities markets and how they bridge/actually don't bridge the distance between corporate fixed-income and municipal markets.
And I think fixing that may do a great deal for transparency within the municipal markets. So as I said before a little bit earlier, I do think transparency needs to be on the agenda, as other folks have said. And I think regulatory disparities including but not limiting to the ones that we focused on today need to be there. So congratulations and kudos to everyone and pressure to really keep going in the years to come. Thanks, Michael.
MR. HEANEY: Thank you, Elisse.
Chairman Clayton, Brett is still trying to be reconnected by the team. So --
CHAIRMAN CLAYTON: That's okay.
MR. HEANEY: -- if I can turn to you first --
CHAIRMAN CLAYTON: Sure. Look. Anything in the Treasury and government securities space, it is really up for grabs. One of the issues for me, Larry, is clearance settlement and how we should be looking at that, whether we should go to some kind of mandated or encouraged central clearing and how that would work. I think Treasury came out with a very good report on all

the different ways that clearing takes place in that market, those types of issues. I think that the events of -- in March demonstrated that we do need to pay more attention to how that market operates -- and I welcome your views. I think it's -- let's put it this way. It is the most important credit market in the world.
MR. TABB: Are there specific ways how we can get involved as a group or committee besides just kind of opining on, you know, the regulation or the proposal?
CHAIRMAN CLAYTON: Let me say this. Look. I think it's no secret that after the election, I plan to move on. That was always my plan. I would encourage this committee to take up these issues. I think this committee is well-followed, well-respected. And there is no prohibition, in fact, encouragement for a committee like this to be commenting on an open rulemaking and concept release. So in addition to maybe a LIBOR refresher as respected -- as suggested by Sonali, engaging on this topic is something that I would encourage this committee to do.
MR. HEANEY: Thank you, Chairman Clayton.
So not surprisingly, what I had viewed and jotted down as most important topics have been largely raised by my esteemed colleagues. I will say this. The corporate and municipal issues that we have evaluated

and analyzed during FIMSAC over largely the past three years, from my vantage point, topics were raised. Topics progressed or were debated. And if they didn't move forward, it was not because they weren't significant. It was perhaps they were just viewed as less significant in the waterfall of the topics that was discussed, which leads the reason why Chairman Clayton had encouraged this session, which is there is more to do. There will always be more to do. This is an ongoing opportunity for us to continue to improve the transparency in fixed-income markets.
My three that I had thrown out there, I believe it was Lee who raised one earlier. It's not in the domain of FIMSAC necessarily. But it talks more about benchmarks. So off-the-run treasuries and a lack of liquidity, well, it's not under the domain, necessarily, of FIMSAC or perhaps what we were tasked to do. It certainly has ramifications with respect to corporate and municipal securities that may be priced off this curve.
Similarly, and the chairman just reemphasized it, the concerns that FIMSAC raised with LIBOR transition to SOFR and potential issues of utilizing a benchmark that perhaps should be further enhanced, that, too, is critical when you think about a benchmark for

U.S. securities that are priced off of that and what that means for not only pricing but volatility of those securities. So I do think this is something that FIMSAC should revisit as we move forward.

The last two that I have jotted down, and they've both been mentioned, is the muni issuer disclosure, improved timing and enhancement of that. I think there is many issues that can be solved or improved with respect to retail investing. And then I think it was Dan who brought up the coordination of various regulators with respect to and certainly within the U.S. credit complex and how we have different regulators within these different portions of the market.

That's a little bit 5,000 feet but -- in altitude, but I think these are all certainly relevant as we think about possibilities of things to work on going forward. So at this point, I will open it up broadly. Chairman Clayton, you have asked along the way. But to yourself, the commissioners or Brett, if there is any other questions or comments -- okay.

CHAIRMAN CLAYTON: Well, Michael, I'm happy to take the questions in the remaining time. And I also respect the value of this time. I'll make two follow-up comments, one on Elisse's comment about the conundrum of

rating agencies.

It has been my experience that approaching rating agencies or the ratings process with a one-size-fits-all solution is really not the way to go. I do believe that we need to recognize that there is a significant difference between investment-grade ratings, sub-investment-grade ratings, ratings of products and ratings of municipal securities. And breaking out our review and analysis of the performance of the ratings process and the value it brings to the market with investors along those lines or other lines that this committee might suggest I think is a possible framework for moving forward in improvement.

And then on your comment about coordination among regulators, I couldn't agree more. But I also have to put a plug in for my fellow financial regulators during this period of stress. I have rarely seen -- and I've had the privilege of working on a number of projects. But I've rarely seen people work more seamlessly and more substantively and more efficiently than we worked in March and April. And I would add that work was only possible -- and this is really important -- because we had good information, not just good information that we generated internally but as we reached out to market participants, including some of

the people looking at me here today.

We were confident that the information we were receiving was accurate. And we were confident that when people told us they didn't know that they were being candid. That was both extremely helpful. So, you know, there is always room for improvement. We've learned a lot in 2008 about how to coordinate and how to take action. I think we put some of that to work this time. But I was very pleased with the seamless nature of working with my colleagues at the Fed, the CFTC, the Treasury and the other federal financial --

MR. HEANEY: Thank you, Chairman Clayton.

I want to thank all the members who participated in this session as well. The observations and the insights are valuable, both to the Commission and certainly to FIMSAC as we are -- go forward. And as I said in my opening remarks, this dialogue will continue. I'm going to briefly go off script one more time.

As we conclude our third year, I just want to thank all the FIMSAC members again for hard work and dedication. I've said it in previous FIMSAC meetings. Juggling full-time jobs during normal times but certainly during these volatile and challenging times past six months and over the past several years along

with the demanding time commitments required by FIMSAC and the subcommittee work where so much of the work is actually done is challenging. Your efforts are nothing short of remarkable. And I feel very strongly about that.

The work performed by FIMSAC will make a difference in fixed-income markets in the future. An additional thank you to the subcommittee chairs, Ananth Madhavan, Lynn Martin, Amy McGarrity, Rick McVey, Gilbert Garcia and Past Chairman Mihir Worah. Time, your leadership, your energy and, many times, your perseverance has been incredible. And we've got many of the things across the line. So I look forward to our ongoing dialogue and our ongoing work, as I said just before. But it has been certainly a productive and an inspiring past three years.

So again, I want to thank everybody for participating in this meeting. It -- despite having to do it virtually, I think it was quite successful. And as I said in my opening comments, I look forward to the next one being back in Washington, D.C. I'm certainly pleased that we're able to put forth our 16th recommendation to the SEC on matters that this group feels as -- are the most important and most critical.

MR. HEANEY: So unless there is any other comments, at this point, I'll entertain a motion to adjourn. Anyone --

MR. STREET: So moved.

MR. HEANEY: Thank you. Thank you again and stay safe, and we look forward to continuing the dialogue.

(Whereupon, at 3:35 p.m., the meeting was adjourned.)

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PROOFREADER'S CERTIFICATE

In the Matter of: SEC FIXED INCOME MARKET STRUCTURE ADVISORY COMMITTEE MEETING

File No: OS-1005

Date: Tuesday, October 13, 2020

Location: Washington, D.C.

This is to certify that I, Christine Boyce (the undersigned), do hereby certify that the foregoing transcript is a complete, true and accurate transcription of all matters contained on the recorded proceedings of the meeting.

______________________ 10/13/2020

(Proofreader's Name)

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I, Jemima Euell, reporter, hereby certify that the foregoing transcript is a complete, true and accurate transcript of the matter indicated, held on __10/5/2020___________, at Washington, D.C., in the matter of:

SEC FIXED INCOME MARKET STRUCTURE ADVISORY COMMITTEE MEETING.

I further certify that this proceeding was recorded by me, and that the foregoing transcript has been prepared under my direction.

10/13/2020

Jemima Euell

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