U.S. SECURITIES AND EXCHANGE COMMISSION

ROUNDTABLE ON OPTIONS MARKET STRUCTURE

Thursday, April 16, 2026

9:00 a.m.

U.S. Securities and Exchange Commission

Auditorium

100 F Street, N.E., Washington, D.C.

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C O N T E N T S

P R O C E E D I N G S

MR. SELWAY: Good morning. Welcome to the Options Roundtable, those of you in the room, and thank you to those of you watching online. My name is Jamie Selway. I am the director of the Commission's Division of Trading and Markets.

Today, we are shining a spotlight on the option market, which often gets lost on the shadow of its bigger and older brother, the equity market. But today we will remedy that a bit. We've got a very impressive group of experienced options practitioners, academics, and folks to join us today.

I would like to start by welcoming our commissioners, Commissioner Uyeda, Commissioner Peirce. We'll start with remarks from them.

Commissioner Peirce, I believe you are up first.

OPENING REMARKS

COMMISSIONER PEIRCE: Thanks, Jamie.

Welcome, everyone. This is a great morning. I'm very excited about this Options Roundtable. Thank you to all the participants and to everyone attending, either in person or online. And thanks to the Commission Staff who made this happen. I am also very grateful to the people who submitted comment letters.

We have a written comment file for this roundtable, and we've gotten some really productive submissions with problems identified and potential solutions and recommendations. So thank you for that. And for those of you watching, feel free to weigh in by submitting your own written comment.

I do expect the discussion today to be informative and entertaining. After all, even the terminology in the options markets is fun. Butterfly and condor spreads? I mean, how can you beat that? We don't do that in the equity markets.

So as Jamie mentioned, despite the fact that the options market is so intriguing, the equities markets tend to overshadow the options market in the Commission's time and attention. And so I think that it's good that we're remedying that today.

As we have been writing and rewriting Reg NMS for the equities market, the options market has grown enormously. That growth has not been just in notional value or in volume, but also in participation and sophistication and in the role of the market within the broader capital markets.

Because of the importance of this market, a persistent item on my wish list as Commissioner has been that we have a roundtable. And thank you, Jamie, for

making this wish come true today.

But should I, who is someone who generally thinks about markets as perfectly capable of functioning on their own with very little regulatory oversight, be inviting oversight of the options market? While the equity markets have been pushed and pulled by the detailed mandates of Reg NMS, the options market has had more space to develop its own solutions, sometimes with gentle nudging from the Commission.

And we're not here today because the options markets are failing, we're here because they're succeeding. We want to ensure that the options market continues to function effectively. As trading and participation reaches new highs, the Commission's role is to ensure that the plumbing is sound and that the playing field remains open to competition.

As we will hear today, the growth in the options market has been impressive, but it has brought with it some matters worthy of consideration. For example, we have seen a proliferation of exchanges -- there are soon to be 20 -- which raises the question of whether we are fostering competition or fostering more market fragmentation, added cost, and greater complexity.

We have seen a notable reduction in the number

of clearing firms, which raises concerns about resiliency and capacity. We have seen a concentration of activity in a few market makers which, combined with the cost of connecting to numerous venues and quoting across millions of options raises concerns about competition and barriers to entry. We've noted the proliferation of strikes, the limited interest in many of them, and the attendant consequences to the market, its infrastructure, and its participants. We've heard from some industry members that generous market maker allocation formulas established years ago to incentivize liquidity provision may inhibit competition and may no longer be necessary in the current market landscape. We've received calls for more transparency with respect to options market data. And, of course, as with many of our markets, we've heard of both the opportunities and the challenges associated with 24/7 trading and tokenization also.

I look forward to a lively discussion on all these topics and more. And unlike the Commission's recent roundtables on the equity market, which have focused on how the Commission can undo the damage it caused through its own Reg NMS heavy-handedness, I anticipate that the solutions that will emerge from today's discussion will be industry led, with the

Commission providing a -- playing a supporting role.

The recent changes to the methodology of the options regulatory fee, which charmingly is referred to as the ORF, are an example of such a solution. Under the previous methodology, the ORF permitted an options exchange almost limitless ability to charge regulatory fees, even for transactions that occurred on other exchanges or involving a product that was not traded on that exchange. This ability, akin to the state of Maryland being able to charge a toll on your car when you're driving over a bridge in Texas, helped to encourage exchange proliferation.

A year ago, when I attended the Options Industry Conference, many doubted that this problem could ever be solved. Yet less than a year later, all the options exchanges have submitted rule changes limiting their ability to assess ORF fees on transactions that are not executed on their own exchange.

I want to congratulate the industry and our Staff in Trading and Markets on the welcome change. Special shout out to Richard Holley.

I hope that the discussions today will lead to similar solutions in the options market that facilitate its growth, foster its resilience, and continue to support innovation that serves investors well.

Thank you all.

(Applause.)

COMMISSIONER UYEDA: Well, good morning, everyone, and thank you, particularly to our Staff in the Division of Trading and Markets, as well as the other Staff of the Commission for organizing this Roundtable on Options Market Structure. Many thanks also to our participants here today who have taken the time to join us and prepare for this event. We look forward to hearing your thoughts.

For as long as I can remember, equity market structure and, to a lesser extent, fixed income market structure have taken center stage at the Commission. It's in our public and regulatory dialogue. In fact, over the years, we've convened advisory committees in both of those areas. Issues like fragmentation, concentration, data asymmetries, and uneven execution quality have been studied exclusively on the equities side. But data recently released by the Commission makes clear that many of the concerns long debated in equities exist even to a greater extent in options.

During the last 10 years, the options landscape has transformed dramatically. Growth in retail participation, particularly in short-dated and

ultra-short-dated strategies has reshaped order flow dynamics, execution pathways, and the economics of being a liquidity provider.

These developments should cause us to reconsider the assumptions behind our existing regulations. For example, how does increasing fragmentation with 15 exchanges with greater than 1 percent market share affect the execution quality of retail marketable orders? We should also consider issues in the institutional space, such as the practical effects of market maker entitlements, data asymmetries, and competitive barriers. Do today's institutional market makers still require the types of incentives and entitlements that exist in current floor auction rules, or has the market evolved to a point where those mechanisms should be revisited?

The Commission should optimize regulations for all types of market participants, including individual persons who are often the beneficiaries of the efforts of institutional investors. I look forward to public feedback on how our rules can be modernized to strengthen execution quality, enhance competition, and ensure that the options market can effectively serve investors, institutions, and issuers alike.

The data is clear and the moment is right for

thoughtful, measured reform. So I thank Chairman Atkins and also our Staff for convening this Options Market Structure Roundtable. Thank you.

(Applause.)

MR. SELWAY: So thank you, Commissioners Peirce and Uyeda, for your remarks today and for your engagement on options market structure. In particular, I would like to credit Commissioner Peirce with the idea of this roundtable which has been granted. Her advocacy and leadership on options help make today possible, and her intellectual curiosity, her passion for our work, and her dedication to core Commission principles regularly make our division better.

I also would like to thank our moderators and distinguished panelists for lending us your valuable time, your expertise, and your experience today to help inform the Commission and the investing public we serve. We are confident this group will lead us through a lively, thought provoking, and informative discussion about current issues in the options market.

Before I begin, please note that my remarks today are provided in my official capacity as the Commission's Director of the Division of Trading and Markets and do not necessarily reflect the views of the Commission, the Commissioners, or members of our Staff.

This disclaimer also applies to the comments of my Division colleagues who will join me as part of today's program.

As we explore current topics in option market structure today, it is useful to remember the Commission's last deep dive into the listed options waters was in 2004, a concept release on competitive developments in option markets. The concept release reflected on fundamental questions about how competition, technology, and investor protection intersect in the option markets. It came on the heels of a transformational time for options. Multiple listing standards had been introduced in August of 1999, driving venue competition. The International Securities Exchange -- remember that? -- launched in May of 2000, becoming the first new entrant in the options market in more than two decades. Controversy marked the introduction of payment for order flow and internalization to option markets then, as execution venues sought to differentiate themselves to customers. Some of the questions raised in the concept release, such as the appropriateness of execution quality disclosure to options trading, remain relevant today.

Now, more than 20 years later, the option market has seen phenomenal growth with increasing retail participation and the addition of more options exchanges, and hence more competition and more investor choice. At the same time, option markets are working harder than ever. The sharp increase in the number of option classes and series and exploding quote traffic necessitate higher levels of technological investment and capital commitment. And despite these transformative changes, liquidity is even more concentrated in a limited set of the most active symbols. Wide spreads are common in less liquid symbols. And large market makers occupy a significant number of specialist appointments. And consolidators control the vast majority of retail flow. Many of the same issues and questions from 2004 persist. It is therefore incumbent upon us to reinform ourselves and revisit where things stand.

In our first segment today, we will delve deeper into these trends via data. As we listen, consider that what's old is new again, albeit with a modern twist. As the option market evolves, many of the underlying policy questions with which the Commission and market participants have grappled over the years remain familiar. But today, we consider these policy questions in a landscape that is profoundly more automated, interconnected, and complex than ever before.

For example, we continue to consider ways to promote and facilitate competition, while addressing any potential negative effects of fragmentation. At the same time, new issues have emerged such as short-term options series with more expirations during the week. And ORF, as Commissioner Peirce noted, I'm happy to say that in the case of the options regulatory fee, every exchange has amended its rules as part of successful if long overdue industry-led reform effort. This reform will move the marketplace to a more equitable and fair regulatory funding model on July 1 of this year.

And to the exchange leader who volunteered last fall to participate in an ORF roundtable on December 24, your Christmas comes early in 2026.

Today's roundtable is an effort by the Commission to once again engage with market participants in a thoughtful dialogue on these issues and to reexamine and reaffirm an approach that supports transparency, fairness, and competition in the markets that investors rely on every day. We should consider how to respond to changing market dynamics whether in technology, trading behavior, or market participation, and reflect on our collective past experience and lessons learned as we do so.

I expect that today's panel will provide

robust discussions that will help us assess these important market structure issues.

Today, first, we will hear from Jesse Brady and Ethan Coombs from the Division's Office of Analytics and Research. Jesse and Ethan will present highlights from their paper that was released last week to support today's discussion. The paper is available on the roundtable website and on the Commission's market structure analytics page. The data describes key trends observed in the options market in recent years.

Following the presentation, we will have three panel discussions. Panel One, moderated by Division colleague Arun Manoharan, will examine how current option market structure facilitates or hinders the ability of liquidity providers to compete fairly and freely in furtherance of a robust national market system.

Our second panel will discuss the customer experience with listed options. Division colleagues John Kroeper and Eric Juzenas will moderate.

After lunch, Chairman Atkins will be making remarks.

Our third and final panel will be moderated by Richard Holley and will consider the growth of listed options, the associated challenges and opportunities

that growth presents, and the issues that the Commission and market participants should consider in the years ahead.

Again, thank you to everyone participating in today's roundtable. We look forward to exploring with you an interesting and always evolving segment of the marketplace which is increasingly important to investors.

I'll now bring up Jesse and Ethan for their presentation.

Gentleman.

(Applause.)

DATA PRESENTATION

MR. BRADY: My name is Jesse Brady. I am with the Office of Analytics and Research.

First, I want to thank Jamie for this opportunity, as well as everyone else that helped support this effort. It takes a lot of people to put something like this together and we really appreciate all the assistance.

I am in the Division of Trading and Markets. And today we are going to be talking through the supporting data paper. We are going to pull out some highlights for discussion here. There is more detail available on the paper, as Jamie stated, that's posted

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on our website.

Before we get started, I will read another disclaimer. Ethan and I are presenting today in our official capacities as Staff of the Division of Trading and Markets. This work does not necessarily reflect the views of the Commission, the Commissioners, or other members of the Staff.

The presentation today will follow along with the sections in our supporting data paper, if you're following along with the paper copy. The first section is going to be the options market trends.

This really isn't a surprise probably to anyone in this room, but options markets have been expanding very rapidly over recent years. I think Jamie and the Commissioners did a great job of summarizing that. But we wanted to put some numbers to that to help further explain this.

In 2012, there were around 3,400 underliers that traded any options trade in the year. And by 2025, that number had increased to over 8,000, representing the majority of NMS stocks, a considerable increase in terms of the number of underliers. Additionally, when we look at individual options securities or OSIs, we went from around half a million in 2012 to nearly five million in 2025. So again, a very significant increase.

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In terms of the venues where options can trade, we went from 14 exchanges in 2012 to 18 in 2025, with additional ones on the way.

When we talk about options market expansion, the conversation frequently shifts to the quote traffic and message traffic. So we will go over that a little bit here.

In 2017, the quote to trade ratio in options was around 9,000 to one. Kind of an eye-popping number on its own. But by 2025, that had increased to 17,000 to one. And what that means in terms of quote messages, in 2017, on the OPRA wire, about nine billion quotes were going out per day in 2017. And now in 2025, by the end of the year, we were around 131 billion quotes per day, which is a large increase on its own. But there were even more significant peaks earlier in 2025.

We pulled a quote from the paper which I think is pretty impactful. By the end of 2025, the OPRA feed was disseminating 3,275 times more messages than it did in the year 2000. Or nearly a full day at that 2000 rate, which was around 40 million a day, every seven seconds. I think that is helpful to put this in context.

Now we wanted to compare the increases we've talked about in the options market, especially on the

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quote to trade ratio, to the equity markets. So we looked at the period 2017 to 2025, and we're showing it here on the screen. The blue line representing the options quote to trade ratio, and that aligns with the right axis, OPRA quote to trade ratio. The red dotted line is the equity SIP quote to trade ratio which you can see on the red dotted line on the screen. As we're showing here, the option quote to trade ratio nearly doubled, going from around 10,000 to nearly 20,000 over this period. Meanwhile, the equity quote to trade ratio was rather stable, starting and finishing near 15.

In terms of message counts, what that translates into is that we have OPRA message totals increasing by 1,300 percent over this period. Meanwhile equity SIP messages only increased by 200, so only double.

Despite all this increase in activity and messaging that we've talked about, we also noted an increasing concentration in the top symbols. So the top 10 symbols in 2012 accounted for around 24 percent of all trading, about a quarter of all trading. By 2025, that had increased to over 30 percent, approaching a third of all trading concentrated in only the top 10 equity symbols. The concentration we noted was even greater in ETP options. In ETP options, the top 10

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products account for almost 84 percent of total volume.

The next section we are going to talk about from the paper is the options market makers. I think the Commissioners did a great job summarizing some of the difficulties facing market makers, and we wanted to put some numbers to support those -- the hardships that market makers may have been facing.

When we look at the count of market makers that reported any focus revenue for options market making, in 2012, we had a total of 98. That number was rather stable until 2015 or so, and then we see a pretty stark decline, where we go into the seventies, down as low as 50 in 2021. This is a significant decline in the number of market makers reporting any revenue, much less significant revenue. In the paper we discuss this concentration seems to be strongest in the small market makers.

We will note from 2021 to 2025 we had the rapid expansion in terms of options market growth. However that doesn't seem to translate directly into the number of market makers, as we see that number does stabilize, but we do not see a material increase.

The next section which is surely going to get a lot of coverage on the panels today is payment for order flow or PFOF. Again, we have a couple quotes from the paper here. Aggregate PFOF payments in options now dwarf those in equities due to a couple factors. One being the higher per-contract rates and then additionally, the growth of the retail options market. Now what this leads to is now PFOF payments from options account for two thirds of all payment for order flow.

The next quote we have here from the paper. Recent academic research finds that the top five payment for order flow providers account for over 95 percent of the total payment for order flow received by brokerages. Options PFOF is highly concentrated, and the top three account for as much as 90 percent of total payment for order flow.

The next section we'll talk about from the paper is market quality and competitive dynamics. The first metric we get into in this section -- and again, as the rest of this presentation will have a little more data, we'll spend a little more time on each slide.

The first metric we looked at were effective spreads in equity options. What we see here is an overall decline when we look at all classes. We see that number in 2012 going from 2.2 percent to 1.9 percent in 2025. You can see on the far righthand, the change here is about 30 basis points. However that decline in effective spreads is really concentrated only

in the top 10 symbols. The second line here, the 1 through 10, moved from 1.3 percent in 2012 to 0.9 percent in 2025, a 40 basis point decline. As we see on the rest of the graph, every other bucket of securities has an increase in effective spreads over this period.

Some of these are rather large. If you look at the hundred and first to two hundred and fiftieth underliers, you see an increase of 150 basis points.

The next metric we looked at was the trade weighted quoted spreads in equity options. Again, these were constant for the top 10, going from 1.6 to 1.6, unchanged. But did widen for all other underliers. ETP options also had a very similar pattern of increases.

As we see in the table here on the righthand side, these changes were also very significant. We have changes going from 110 basis points up to 260 basis points, so considerable increases in that trade weighted quoted spread.

The next section we are going to present on is the customer experience in options. And I am going to invite my colleague Ethan Coombs up to do this section.

MR. COOMBS: Thank you, Jesse.

This next section about the customer experience will examine how customer orders are executed in the options market.

This is a sale condition breakdown for customer orders. It shows that over 26 percent of customer dollar volume is classified as multi-leg electronic, so orders executed in the complex order book. Over 11 percent of customer dollar volume was multi-leg auction, which are complex orders executed in a price improvement auction. Two point seven five percent of customer dollar volume is classified as other. Many of those orders were executed on the options floor. The remaining 60 percent of volume are single-leg orders executed in either the electronic order book or price improvement auction.

On the following slides, we've provided CAT-derived execution metrics for those single-leg orders that make up more than 60 percent of individual customer dollar volume.

On this slide, we examine price improvement and effective spreads for marketable orders, the vast majority of which are executed in the electronic order book or price improvement auction. We've looked at these market quality metrics across spread widths. For these metrics, marketable means the limit price could execute across the NBBO at the time of first submission to an exchange. Price improvement and effective spread were both calculated on that initial NBBO.

For marketable orders, we think price improvement is a particularly valuable metric, due to the fact that by crossing the entire spread, marketable orders control for the variable aggressiveness of the customer in non-market limit orders. The top table shows price improvement where auctions live up to their price improvement name by providing the most improvement across spread widths. For example, 22 percent of orders that had a quoted spread between a penny and a nickel executed at a price better than the NBBO; 89 percent of orders with a spread between $1 and $5 were executed at better price. Compare this to the electronic book, where almost no orders had price improvement with spread widths between a penny and a nickel, and 5 percent of orders were improved where spreads were between $1 and $5.

The second table shows that effective spreads for the electronic market and price improvement auctions were very similar across the more narrow spread widths. As quoted spreads widen, auctions result in lower effective spreads. For instance, when quoted spreads were between a quarter and a dollar, effective spreads were 17 cents for auctions and 37 cents for electronic.

On this slide, we show the utilization rate between the various execution methods across spread widths for individual account marketable orders. Across spread widths, the electronic order book is used one and a half to three times more than price improvement auctions.

Here are the same metrics for individual account nonmarketable limit orders instead of marketable orders. Again, we look at price improvement in the top table and effective spread below. We see high rates of price improvement across the board, which is what you would probably expect, given that the initial limit was inside the initial NBBO that is used to calculate price improvement. We do still see high rates of price improvement for auctions, 96 percent versus 80 percent for electronic executions, where the NBBO is less than or equal to a nickel.

When we turn to effective spreads, again as below, we see significantly lower effective spreads for auctions versus electronic execution in all market widths greater than a nickel. For instance, in markets with a quoted spread of 6 to 10 cents, we see auctions providing an effective spread of 2 cents versus 5 for electronic.

On this slide, we show the utilization rate between execution methods across spread widths for individual account non-marketable limit orders.

Interestingly, we see our highest auction utilization rate of any band with non-marketable limit orders and spreads between a penny and a nickel. This is the only band in our data that has a higher than 50 percent auction execution rate. Auction usage rates decline as spread widths widen for non-marketable limit orders in our sample.

We are going to turn now and talk about trading in options with zero days to expiration.

Options have always traded on their expiration day, but they have grown in popularity in recent years. You can see the growth from 2022 to 2025 here.

On this slide, we show which types of accounts are active in zero day versus non-zero day options. Individual customer accounts, represented by the dark blue, are a much larger percentage of volume at expiration than non-expiry days. Institutional customers, on the other hand, are a much smaller proportion of volume in zero day options than others. You can see institutional customers in the light blue.

Here we looked at the types of customers that traded zero days in 2022 versus 2025. We find that while it is still disproportionately individual accounts, some of the market share has gone towards other proprietary and foreign broker types.

In our final section, we would like to talk about the types of accounts we see participating in options trading. Here we have the rates of CCIDs reporting any amount of options trading. Despite the options market growth, those rates are still single digit outside of the other proprietary CCID category.

In our data, we see the rate of new individual customer CCIDs declining and an increasing trend for foreign CCIDs. We want to note here that foreign CCIDs can sometimes represent an omnibus account with multiple people behind it, so it isn't a perfect comparison to the individual customer account type.

(Pause.)

MR. COOMBS: Should I tell my joke now?

MR. BRADY: Yeah, do your joke.

MR. COOMBS: I have a joke from my nine year old. Why didn't the black hole cry? It pulled itself together.

It's from a nine year old. You have to laugh or you're bullying a child.

(Laughter.)

MR. COOMBS: Looking at individual customer CCIDs, we should be clear that we are documenting CCIDs new to CAT, which starts in mid-2021. So the fast falloff at the beginning should be viewed as our data

converging to the actual number of accounts being activated. After that convergence is functionally complete, we see the number of monthly CCIDs stabilize before entering a long, slow decline in 2024, which continues despite the record high contract volumes in the options market.

There isn't a big enough reservoir of preexisting foreign accounts to have an obvious convergence at the beginning, and we see a clear pattern of growth for most of the period. The highest number of new foreign CCIDs is still several times lower than individual accounts.

As Staff members, we don't want to speculate on if or when they might pass each other. But if our panelists want to give it a shot, they should feel free.

Okay, that's it for us. I want to say thanks for coming here today and for reading the paper. I hope it's helpful and supports a fruitful conversation about the options market.

(Applause.)

MR. SELWAY: Many thanks, Jesse and Ethan. Thank you for contending with technology. Better to break closer to the end than the beginning.

So panelists for the first panel please come up and join us. Arun also.

Wonderful. Well, I am happy to introduce my colleague from the Division, Arun Manoharan, who will moderate our first panel.

Arun, you ready to roll?

MR. MANOHARAN: Ready to roll.

PANEL ONE:

FACILITATING COMPETITION IN A QUOTE-DRIVEN MARKET

MR. MANOHARAN: All right, good morning, everyone. As Jamie mentioned this is the first panel of three. And it's titled Facilitating Competition in a Quote-Driven Market. We are going to talk about a range of issues today, ranging from market maker guarantees, price improvement auctions, and more.

As Jamie mentioned, my name is Arun Manoharan. I am assistant director in the Office of Analytics and Research in the Division of Trading and Markets. I've been at the SEC for over 12 years. And many of those years, I have worked on a ton of different issues in the options market. And so I am very excited to be the moderator today, along with Director Selway. And we have a great number of experienced market professionals today to help us on the panel, many of whom I've worked with over the years. And so to kick us off, let's everyone introduce ourselves, starting with Ivan.

MR. BROWN: Good morning. I am Ivan Brown,

head of options at IEX. Prior to that, I served as head of options and business development for the New York Stock Exchange.

I want to thank the Commissioners and Staff for providing this forum today to discuss important issues in the growing and dynamic U.S. options markets. Given the extraordinary growth in options trading, it's critical that market structure remains well positioned to support vigorous competition, strong displayed markets, and positive outcomes for end investors. We look forward to working cooperatively with all industry participants in advancing this goal.

IEX is proud of its record as an innovator, driving more liquidity and better prices on its equities market, and we're excited to bring that same approach to options later this year. Thank you for having us.

MR. CRUTCHFIELD: Good morning. I'm Steve Crutchfield. Until recently, I was a partner at Chicago Trading Company, where I was head of business development globally. Prior to that, also at CTC, I oversaw equity options market making for the firm. Previously, I was an executive vice president and head of options and ETFs for New York Stock Exchange, among a number of other roles there. I was also CEO of NYSE AMEX options.

And I should say for the record, my opinions today are my own and not necessarily those of CTC or any other party. Thanks for having me.

MR. DUCKLES: Hi. My name is Nathan Duckles. I lead our U.S. equity options business at Jane Street and have helped to build and support Jane Street's options business since I started there in 2008.

As background, Jane Street is a global market making and quantitative trading firm that's active in a broad range of asset classes around the world. In the U.S., we provide equities and options liquidity as a market maker, as an institutional liquidity provider, as a wholesaler. By volume, we are one of the largest U.S. options market participants.

I would like to thank Chairman Atkins, Commissioners Peirce and Uyeda, Directors Selway and Manoharan, and Richard Holley and the whole Trading and Markets team for the opportunity to engage on these important subjects alongside such a distinguished group of industry colleagues.

MR. FISCHER: Good morning. I'm John Fischer, head of market structure and business development at Citadel Securities. We are a leading market maker in the U.S. options ecosystem, serving both retail and institutional participants. We provide liquidity on

screen as well as across all options trading floors.

The U.S. options markets are the envy of the world. Retail participants in particular have never had it better. They benefit from significant price improvement, free commission trading, and access to a wide range of innovative products.

That said, there are targeted areas that we believe warrant review. Exchange proliferation has introduced significant cost and complexity to the market. We estimate that small options venues introduce a cost of $200 million to the industry annually. We should also consider introducing Rule 605, execution quality disclosure, to options. We should evaluate the role that trading floors play in options ecosystem. We believe that the value that they once introduced to investors is no longer the case. And we should consider modernizing capital requirements to ensure they are sufficiently risk based. I look forward to the discussion today.

MR. JOHN KINAHAN: Hi, good morning. My name is John Kinahan. I am the CEO of Group One. Group One is a market making firm that is somewhat unique among some of its larger competitors in that we don't have an affiliated arm or related company to wholesale or route order flow. I've been at Group One for the entirety of my career and have been the CEO since 2014.

I want to thank the Commission for offering us the platform to speak. I think in many ways our markets are extremely well functioning and thriving, but there is always something new to talk about. There are some old things to talk about, too. And I'm grateful for the platform. So thank you.

MS. KOLCHIN: Hi, I'M Katie Kolchin. I'm head of equity and options market structure for SIFMA. I wanted to thank the Chairman, the Commissioners, Jamie and Richard and the whole team for inviting me to join this important conversation today. And I want to thank Commissioner Peirce for some inspiration earlier.

Both Jamie and Richard had asked me what animal I was going to come up with for today, and I was struggling until Commissioner Peirce said butterfly. And it dawned on me, despite their small size and their delicate nature, butterflies are actually extremely resilient and adaptive, and that's what the options markets have been.

MR. MAYHEW: Thanks to the Commission and the Division of Trading and Markets for inviting me. My name is Stewart Mayhew. I am the honorary former academic on the panel. I started my career teaching MBAs as a finance professor at Purdue University. I

came to the SEC. I was here for eight years, from 2002 to 2010, where I worked on many of the option SRO exchange rulemaking projects. I was in the Office of Economic Analysis, which is now known as DERA. And options has been the focus of my academic career, it was a focus of much of what I did here at the SEC.

For the last 15-plus years, I've been at Cornerstone Research, where I co-head our securities enforcement practice area. I work on a lot of civil litigation matters and internal investigations. But one of the things I do there is assist market participants to evaluate and analyze and comment on proposed SEC rulemaking, including in the trading and markets space. So I'm pleased to be here, and I look forward to hearing everybody's remarks.

MR. SCHULTZ: Hello. I'm Andrew Schultz from Susquehanna. I would like to thank the SEC and the other participants for including us in this roundtable. I've been with Susquehanna for 29 years, beginning my career as an options market maker on the AMEX floor. For the past 15 years, I've served as head of strategic options business development, working closely with our market making and technology teams to prioritize and advance our options initiatives. I previously served on the MIAX Exchange Board and I currently sit on the

Nasdaq Exchange Board. I look forward to discussing these topics today.

MR. SOSNICK: Hi. My name's Steve Sosnick. I'm the chief strategist at Interactive Brokers. A little background is I started -- I joined the firm 30 years ago. I joined this little market making firm called Timber Hill. I co-managed our options market making for many years before we exited the business to focus on customer business, to speak to that chart of declining market maker participation. We felt it was better to serve our customers by not wearing two hats.

But over the years, I sort of morphed into a talking head, basically. Right? Mostly writing, presenting, things of that nature.

A quick thing, I last spoke in front of the SEC at a panel you guys did after Dodd-Frank in New York when that came in. And there was a panel basically that --

MR. SELWAY: Welcome back. Let's do better this time.

(Laughter.)

MR. SOSNICK: So, yeah. The talk was, like, Congress handed us this legislation. Can you help us figure out what to do with it? And it was a roundtable of this nature. So I'll let everybody else decide how

that went.

And so I am very happy to be here and happy to represent my firm on behalf of this. And thank you to the Commission, the Commissioners, and to Richard Holley for putting this together.

MR. TYRRELL: Hi. I'm Kevin Tyrrell. I am the head of markets at NYSE. I would like to thank the Commission and the Staff for having me here today and am very happy to be put on a panel with so many esteemed NYSE alumni.

NYSE operates two options exchange, NYSE American, NYSE Arca. We have a little over 21 percent of market share in multi-listed trading volume. And uniquely, we have two trading floors in addition to the full electronic offering.

In terms of the options industry, we view the industry as fundamentally strong, echoing many of the sentiments already spoken here today, and we think that's really created this environment for the phenomenal volume growth we've seen over the last few years. So we are eager to work with the industry on keeping the ball moving forward, keep advancing topics. I think the industry is strongest when it works together and collaborates. And I think upcoming topics like extended hours trading are going to need a lot of industry collaboration, so we are here to work with everyone.

MR. MANOHARAN: All right, fantastic. So first we are going to turn to Katie, who is going to provide some context on the options market that will help inform today's discussion.

Katie, the floor is yours.

MS. KOLCHIN: Thank you. So we thought since this is panel one, it would be nice to set the scene. So some of which I'm going to say everyone in this room knows. But for the benefit of everyone who is going to tune in, either live or on the recording of this, so people like to draw comparisons between the options and equity markets, but they have very different market structures. Options are quote-driven markets versus order-driven in equities. So at a high level in what's going to be important for this panel, this means options markets are determined by those who make the markets rather than by the investors.

There is no off-exchange trading in options, whereas equity markets currently trade just under 50 percent off exchange. If you turn to products traded, options have between 1.9 to 2 million strikes, depending on the time period you're looking at, versus over 10,000 stocks and ETPs in equities. So that's 188 times more

quotes for a market maker to manage.

As to market participants, there has been growth in retail participation in both options and equities. While equities has leveled out around 20 percent, you can think about, depending on how you break this out, retail participation in options is around or above 30 percent. Although if you look at some data, that's focused in on the retail and self-directed brokers, they're about 50 percent of total volume.

The next comparison I'm going to make might come off looking more like a similarity than a difference. This is the trading venues. So options currently have 18, soon to be 20 exchanges, versus 17, soon to be 19 in equities. So that doesn't sound so different. Right?

Well, here's the difference. Let's draw a line at a 1 percent market share per exchange. All of the options exchanges, again, depending on time period you're looking at are over this threshold. You turn to the equities markets, and 10 out of the 17 exchanges are below a 1 percent market share. And seven of those exchanges are less than 0.5 percent market share.

So let's move on to the growth in options. And there's been plenty of growth to discuss. There's growth in volumes. ADV is now just shy of the 70

million contract level, and that's a 260 percent increase since 2019. There is growth in venues, again the 18 going on 20. You can get to a similar 260 percent growth rate if you go back to 2000 when there were only five exchanges. But even since 2010, there has been around 100 percent growth in number of venues.

There's growth in strikes. If you think about that 1.9 to 2 million, depending on time period again, that's an over 100 percent growth rate since 2019.

The team presented earlier the growth in messaging. And the number was over 1,300 percent since 2017. There's growth in products to be traded. So if you look at the CBOE data, there's more than half the volume now. The split has shifted, if you split it by a less than one week to expiration versus over one week. Now it's more towards the less than one week. And as we saw earlier, 28 percent of that is zero DTE.

So what does all of the growth mean? Well, for retail, it has produced a positive experience. I am sure you are going to hear this 50 more times today, but retail has never had it better.

So does that mean our conversation ends here? No. First, we can always strive to be even better. And second, growth comes with a darker side, too. Let's talk about strike proliferation, which I'm also sure

we're going to hear a lot about today.

This is also exasperated by the increase in number of exchanges. So this means market makers are managing -- just looking one sided -- over 35 million quotes. When the other two exchanges come on board, this increases to 39. That's an 11 percent increase just for adding two more exchanges. So strike proliferation is increasing the complexity and the cost for market makers.

And speaking of cost, I'd be in hot water with my members if I did not bring this up. We've got costs continuing to balloon, that's data and connectivity fees for every exchange. And, of course, there's ORF. There was a Bloomberg article that showed for 2025, ORF cost the industry and investors in the range of 181 to 234 million.

So this panel is about competition. If you think about that, what does that mean? When you are making a strategic business decision to either enter or remain in a business, your equation has a cost and a revenue side. So this panel is going to tackle a lot of the revenue decisions. But isn't it time we also took a serious look at the cost side? Could it be that the ante just to get a seat at the table has now grown too high?

So markets are evolving. Kevin already alluded to the fact that extended trading is coming to options, too. And we should keep asking these questions and analyzing the data to assess the current environment. And that means studying and questioning both sides of the strategic equation, the revenue opportunities, and the costs. That is a healthy thing to do.

Thank you.

MR. MANOHARAN: Thanks, Katie. That was really helpful. And I'm sure we're going to touch upon all those issues in this panel, as well as the following two.

All right, for our first topic, let's turn to market maker guarantees. Panelists, from your perspective, how would you describe the state of competition between specialists and market makers? In particular, what effect does the 40 percent guaranteed allocation as well as the specialist small order guarantee have on competition?

MR. DUCKLES: Thank you. From Jane Stret's perspective, we believe the principle that ought to guide the SEC here is that facilitating competition means that participants that are capable of providing an equal service are on an equal competitive footing. And

so the -- we see no issue, per se, with exchanges choosing to incentivize services such as quoting up time or opening quotations with things like small order guarantees or guaranteed allocations. The issue that we see is that the specialist for life model that exists on certain exchanges or noncompetitive specialist allocation processes functionally mean that new entrants face barriers that don't exist for incumbent market makers.

So we don't think that the SEC needs to take on the task of dictating what the right model is for an exchange. But we do see a lower touch path towards fostering innovation by allowing exchanges to embrace new models for incentivizing liquidity or up time. One example here would be supporting exchange models where any market maker who can fulfill the same obligations has access to the same rights that a specialist would, so you'd have multiple market makers fulfilling that on a single exchange.

MR. MANOHARAN: Great. Thanks, Nathan.

MR. TYRRELL: So from our perspective, the exchange perspective, you know, to us a lot of this is key to our competition relative to other exchanges. So we are really trying to balance the right incentives and also make sure we're not too stagnant in the way we

approach this.

And some of the things we've done in the last few years is we've taken a hard look at the way we have a process to determine who is a specialist in a name. We have competitive elements to that. We introduced something last year where we had sort of a check to make sure the primary and secondary specialists, our AMEX exchange were truly providing volume and truly helping, you know, our competitive positioning.

So I think there is a lot that can be done here, I think, just by competition. We have 18, to be 20 exchanges. I think there's enough sort of competitive landscape and sort of exchange capacity in the industry, that if there were ways to try new incentive programs, there's a lot of opportunities for people to do so. There's a lot of exchange medallions out there that could do that. You know, we're trying to make sure our model evolves as the competitive landscape changes. And as we've seen, a few new market makers enter the space, and market makers getting into new lines of business, we're trying to keep the market kind of up to date with what's happening.

MR. FISCHER: Yeah, I think it's helpful to set the scene here. So we'll hear many times today that options markets are quote driven and specialists are

critical to that ecosystem. They have the most stringent quoting requirements of any market maker and any market participant. Also, just to set the stage in additional context, not all options exchanges have specialists. Eleven of the 18 options exchanges have specialist assignments. And it is primarily the pro rata venues.

In addition, not all market makers choose to be specialists. There are 14 market makers that have specialist assignments today. That is in large part because of the higher quoting obligations that specialists have. So specialists have increased quoting presence times of 90 percent versus 60 percent for other market makers. They have requirements to support the opening for series. And they have to quote a broader range of strikes, including leaps and adjusted contracts.

So it's important also to remember that most options are illiquid. That includes in liquid underliers. Without specialists, there wouldn't be screens, or there would be very wide screens in many of these options, which would cost investors.

So in return for those obligations, specialists have certain benefits. There's a 40 percent participation in marketable order flow. That 40 percent rule exists throughout many aspects of options market structure, including in auctions, directed order market makers, as well as on the floor. Specialists also have the benefit of 100 percent allocation of orders that are five lots and less.

I think guarantee there is a misnomer. The specialist must be at the NBBO to be participating on any of that order flow. So at a minimum, investors always get the best available price. Also any firm or any market maker on any venue, including venues that don't have specialist assignments, can improve the specialist price by one tick. And the specialist then gets no benefits. So I think those nuances are very important.

The addition to that is directed order flow bypasses specialists. So almost all activity today is directed to a market maker. And when directed to a market maker that is not the specialist, the specialist gets no advantage over any other market maker.

So just to recap, there are significant obligations. And with those significant obligations come small benefits that come after being at the NBBO, after nondirected orders, and only on specialist venues.

MR. JOHN KINAHAN: I think group one's position is like philosophically the market functions

better when, you know, there are fewer like set-aside guarantees on different segments of order flow. But I do acknowledge that there are increased burdens for compliance purposes, and also to build on Nathan's comments, like there are different levels of service that are provided by different market participants, too. That has to be acknowledged.

But I will also say that in a simple kind of experiment, like if those market marker guarantees didn't exist, we would make different markets. And my guess is they would be tighter or deeper or some combination thereof. I will also say, though, that that's not the only thing that would change and it's not immediately predictable as to exactly what that outcome would be. You'd see routing behavior change, the price of order flow would probably change. So it would be pretty complicated. But from a strictly simple, philosophical point of view, the fewer guarantees that are out there, like the -- my guess is, in the long run, the tighter market you'll have.

MR. CRUTCHFIELD: All right, so I have proposed with some friends a drinking game. And it's called the envy of the world drinking game. Which is you go to an industry event and every time somebody says that the U.S. markets are the envy of the world, you

have a sip of your coffee.

So, John Fischer, thank you. It was about 30 seconds into this panel, I think, when we heard that phrase.

I'm making a little bit of a joke, obviously. But it's true. We've got very healthy markets. We've got an excellent customer experience. We saw a lot of statistics earlier. There are many ways to slice pretty much all of them. And thank you, by the way, for that presentation. But it's certainly true that overall we've got a very good experience for investors.

That said, Katie said this very well, the competitive dynamics on the liquidity providing side have been skewed through no generally bad action but sort of through inaction in the natural evolution of markets over decades. It's interesting to me to hear that there was an options market concept released back in 2004. I have to go back and look for that. But it's certainly been some time. So thank you again for having us here today and fostering this discussion.

Imagine the counter factual. Pretend there's no five lot rule. So I am going to mostly talk about the five lot rule, that says that specialists, they call them DPMs, various things on various markets, but specialists get all of orders up to five contracts if

they're routed to them when they're on the quote.

Now pretend that rule doesn't exist. And someone says, I have a great idea. Exchanges are going to get to pick a market maker in every class based on some opaque process and then that market maker will get all the five lots routed to them whenever on the quote on that exchange for the rest of their lives. And then there's something about quoting obligations, which I'll come back to in a second. But basically, that's the story.

If somebody suggested that in a world where we didn't have that, I think precisely nobody would say that's a great idea, that's a market structure that we should have. So my view, respectfully, is I think all the arguments you hear in favor of this are either status quo bias, which we all have it, including me, but we're used to this thing. It seems normal. Oh, yeah, we have five lots. Or a little bit of self-interest or maybe a little bit of column A and a little bit of column B.

So as was alluded to briefly earlier, the reason we have specialists in the first place, or at least going back several decades -- I started my career on the floor of the Cboe as an intern in 1997, they only had what they called DPMs in a very small number of

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issues. It was the most illiquid classes where there was not enough natural liquidity provision from market makers who have an incentive to make a two-sided market for customers to have a good experience. And that made a ton of sense. And, by the way, it's entirely appropriate for an exchange to be able to say, we really need help in this name, we're going to give you some special incentives to provide liquidity in this name because the natural liquidity on the screen is not sufficiently healthy. And that's where the DPM, the special assistance came from, that's where the five lot rule came from. It was one of those incentives.

But I would respectfully submit it makes zero sense today in a Tesla, an Nvidia, an Amazon, an Apple, or any of the top one, two, three, 500 symbols where competition is intense among market makers electronically, beyond anything that Cboe or anyone in the '90s would have envisioned.

A DPM appointment in a name like Tesla provides precisely zero marginal market quality, while awarding a massive benefit that then sits with that party essentially forever. So the effect that has on competition it's stifling. I respectfully would say I think John Fischer is completely mistaken in saying that the reason parties don't get DPM allocations is because

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of the heightened obligation. The obligation is not material at some market with -- in a higher percentage. Most of us who have electronic market making systems, you can turn a knob in your system, you can meet that obligation.

The reason more market makers don't go after these DPM allocations, number one, is we can't. I can't just sign up and say, I want to be the specialist in Apple now on the Cboe. Somebody already has that appointment. And they're not going to lose it in the next decade, probably, unless they screw up or sell it.

Two, there is no benefit to having that appointment unless you have the order flow. I could be the specialist in Apple. Nobody is going to route five lots to me because I don't control an order flow relationship that has the ability to decide what exchange those five lots go to.

Exchanges will say they review these. I oversaw that process myself for years at NYSE. Ivan's done it, Kevin's done it. There's a massive incentive among exchanges, no matter the best intentions you have in fostering liquidity, to ensure that big guys have these specialist seats. Because if you give it to somebody else, you're going to lose flow. By the way, you might lose flow as an exchange in a different

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symbol, not the one for which you're giving away the specialist allocation, because the big order routers know they have that leverage over you as an exchange.

So, yeah, not a good rule. I would say it just doesn't make any sense.

Oh, a last point. Sorry.

I don't think exchanges can fix this on their own. I don't think competition is going to get you there. Because Kevin's got an incentive. You know, he wants five lots. And he could say, you know, I'm going to do the right thing, I think this rule creates perverse incentives and is not an appropriate reward for the amount of marginal liquidity actually being provided. So I'm going to get rid of my five lot rule. Are you going to do that unilaterally? You're not. Right? Because you know, okay, all those three lots and five lots and one lots and two lots are going to go to a competitor that says, you know what, I think I'm going to keep my five lot rule, I like this order flow.

So this is where, and Commissioner Peirce used the phrase earlier, a gentle regulatory nudge or friendly nudge from the SEC I think would be incredibly valuable. If I were to get to, you know, respectfully propose a change, I would say five lot appointments, the five lot aspect -- I've conflated this a bit with

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specialists and DPMs. But the five lot entitlement specifically should be limited only to the most illiquid classes. For example, the bottom 20 percent of classes by volume. It should be subject to rigorous annual review using metrics other than the market makers' volume, by the way. Because volume is self-fulfilling. If you're the specialist and you get all the five lots, your volume is going to be higher than anybody else, almost kind of ipso facto. So other metrics tied to liquidity provision should be required to be satisfied to keep those appointments. And there should be an expectation of mandatory reallocation every couple of years to prevent these things from being locked up forever.

Sorry for the passion, but I think this is an important issue and one that it would be great to get right.

MR. MANOHARAN: So I think Kevin's name was invoked, so I'll give him the opportunity to respond.

MR. TYRRELL: In some ways, I'm almost going to agree a little bit. Because you mentioned that traditionally, or in the past, this was needed on the less active names where there were some good market. In today's world, you know, the market may not need help on Apple, Tesla, and Nvidia. But NYSE AMEX might, versus

Cboe and Nasdaq. So it's an incentive program. We have any number of incentive programs across exchanges, across asset classes that we use. This is one incentive program.

Like I said before, we realize if you don't handle it right, it could actually limit competition on your exchange. We feel like more competition on our exchange that makes our exchanges more competitive relative to other exchanges. So we do look -- we have been looking at it. We've changed the process since your time. So we've tried to update that a little bit. But, you know, we do view it as a valuable incentive that we need in a competitive landscape.

MR. BROWN: I guess I get to bring it home. I'll try and economize my comments.

I mean, I think foundationally, right, like options markets function best when there is competition at the late quote, right? And the late quote effectively serves as the backbone of price validation that drives investor confidence and engagement, which is foundationally what we are all in the business of doing.

You know, as a technical matter, you know, competition among specialists and market makers isn't shaped as much by market structure as it is by participant behavior. It is technically true.

Guaranteed allocations reduce the portion of order flow that is broadly accessible to others. However, as some of the panelists have pointed out, that serves a purpose. Right? There is a certain rewarding of obligations, capital commitment, you know, service elements of clients, and being at the NBBO.

I think the core question actually is one of calibration and balancing the incentives to further vigorous quote competition, and at the same time reward that service that's being provided. I think if you look at like the 40 percent guarantee allocation, for example, that's relatively benign. Right? Because, still, 60 percent is available to other participants to participate with.

I think the question that's, you know, the most debate is probably the small order guarantee, which I think is certainly more limiting in isolation. And it is true it perhaps incentivized specialists to direct more flow in general to a venue. But I think the point that I would make is that these dynamics, however, are at the single venue level and, in practice, we compete in a multi-venue ecosystem, where participants can access multiple guarantees and other forms of internalization across multiple venues. And the cumulative effect of those guarantees stacking is that a

more meaningful share of order flow is less broadly available for competition than 18, soon to be 20, venues with otherwise suggest.

And rationally, that impacts incentives. Right? If you have a lower probability of interaction and you're more likely to interact with toxic and not benign order flow, then you'll likely be less aggressive in your quoting and commit less capital as a result.

And so I think from our point of view, this comes down to balance. Number of participants have highlighted the fact that specialists are a scarce asset, and that creates a distribution between those that have them and those that are new entrants. And so I think from that point of view, you have to look in sort of a balance and coordination is like are these broadly available to all participants? Is the level of competition that facilitates their assignment also commensurate?

But whatever we do, it has to be done both holistic in scope and coordinated in application. Because if you eliminate or -- or transfer the way one guarantee functions, it likely redistributes that activity to another venue or mechanism, as opposed to improving competition in and of itself.

MR. MANOHARAN: Andrew.

MR. SCHULTZ: I was just going to add a couple points and won't be very long.

We're talking about this five lot and this allocation thing. But it's important to remember, and I think John mentioned it, a third of the exchanged are price time, so it doesn't apply there. And roughly two thirds of the volume are spreads and auctions and other trading. So we're talking about this allocation on a very small portion, like marketable, versus nonmarketable, versus complex. So we're talking about a -- you know, it's not the entire marketplace where this 40 percent is involved.

And then just quickly on the obligations, there was a lot of conversation about kind of quote traffic and, you know, the massive multiplier of quotes that's being sent. I think that that is probably an area where we can take a look at kind of what those obligations really mean. We've talked about the costs and the revenues and whether it's 60 percent or 90 percent or 99 percent. I think there is a situation where we could kind of look to see how those obligations pay off. If market makers and all of us here only have revenue when there's a trade happening, and so if you're on a quote that's wide and not on that quote, you have no chance of trading, which is not what any of us really are looking to do. So if we're thinking about where our quotes are versus where our quotes are required, I think that's an area where kind of the exchanges could possibly modernize their approach.

MR. FISCHER: I appreciate Steve's passion. There was a lot that was said there. Obviously, I won't respond to everything. But I think a couple of points that have been raised, the -- you know, I think the fact that liquid issues don't need specialists because there is plenty of activity across from all market makers is just not true across all series. You know, there are thousands of series listed in the most liquid underliers, and many of them don't have liquidity. And without a specialist, they wouldn't have liquidity.

Also I think just the argument anyone is available to participate in new issues and can go and solicit for new listed underliers for those specialists. And so if they were in fact that valuable and obligations were not as significant as they are, many more market makers would participate in that, and not all do.

And one more point. Steve, as Andrew said, price time venues, most price time venues do not have specialist assignments. You could ignore all this, this entire conversation, if a market maker priced one tick

inside the specialist. Which those market makers are at a fee advantage versus a specialist in most cases. Those price time venues typically offer a higher rebate for market makers, whereas as a specialist you are normally on a pro rata venue, you're paying a fee. You've also paid for the order flow itself.

MR. CRUTCHFIELD: Yeah, just a couple points there if I may. And thank you for responding to that.

A couple things. One, so you could certainly make the argument that it is appropriate -- and I did -- in less liquid issues to have someone who has a heightened quoting obligation in return for certain rewards. Sure. You could break it down at the month or at the strike level if you want. But I think it is pretty incontrovertible that the most liquid option -- and again, slice it how you like it, could be by class, it could be by term, it could be by strike. But the most liquid options products in the industry do not need a special five lot allocation to a single party forever as an incentive to keep them liquid.

With regard to the price time point that was made by a couple folks, what I would say there is, sure, there are price time markets. There are times when a specialist is not on the NBBO. And in those cases, of course, none of this matters. But just to put this into

perspective, the reason I'm harping on five lots so much, these are -- if you do the math, and I have on behalf of a market maker that does not have order flow relationships and considers getting into that game, it pretty quickly becomes apparent that the value of five lots is extremely high. These tend to be the least toxic, nonprofessional orders. They occur in vast numbers, especially since COVID. They are very attractive to trade with. And incidentally, that is precisely why you hear various folks saying, like, hey, this is really important, we want to keep this, this is good for us. It's because it's important.

So I think arguing that it doesn't actually matter that much is a little bit -- a little bit inaccurate.

But even given all of those points, yes, sometimes somebody improves by a penny on Arca and the specialists are all deprived of the allocation. Nonetheless, during the course of the day, there are I don't know how many millions of times a day that a one, two, three, four, five lot is routed by a firm that has control of a router at an instant where they have a specialist somewhere that is on the quote, and strictly as a result of that legacy appointment from in some cases 20 years ago, that firm gets to trade that entire

order. It happens every day in massive volumes.

So I don't think we could really say that like, well, somebody could -- sometimes somebody could improve the -- sure, sometimes somebody does improve the price. But it is still the case that this distortive allocation practice exists and is massively impactful to markets today.

MR. MANOHARAN: Great. Wow, what a good first question. Okay.

All righty. So staying with competition, directed market makers are a unique aspect of options market structure. They enable order flow providers to send an order to interact with a specific market maker, quoting at the best price, who may potentially be an affiliate, which can then facilitate internalization. What are panelists' experience with the directed market makers or other ways in which brokers might seek to gain market share?

I know we've touched upon this already, but Steve.

MR. CRUTCHFIELD: Thank you, Arun.

We actually -- I have a somewhat unique experience with this, because Interactive Brokers really started as an outgrowth of our market making business. We had this market making business and we built all this extra electronic trading capacity and said, wait a minute, the fixed cost's already in. Maybe we could use some of that to route it to our market making books or our DPMs and get the five lots et cetera. That kind of thing. And we've also uniquely walked away from a lot of this.

And one of the -- one of the things that you're going to hear from me pretty much as a mantra is it's always about what's best for the customer. And I think to some extent, best execution sometimes is good enough execution, not necessarily best execution. A lot of times, you have to work hard to get the best execution. And what I'm going to say there is we have two models for our customers to choose from. One is light, which is basically in stocks, you know, free trading, and the stuff gets routed and, you know, pretty much hands off. And we have pro, which is basically we will use all sorts of proprietary algorithms to try to get best -- the best execution for our customer. And the vast majority of our customers opt for the pro, meaning they see the price improvement, they appreciate the price improvement.

So how does that come into direct routing? We will do it. But, you know, only if we can really feel that it achieves the best outcome for the customers.

That can be measured a few different ways. It can be done with price improvement, it can be done with mark-outs, markdowns. But in general, you know, PFOF is nice if you're just going to -- I hate to say it -- be a little bit lazy about it and just sort of say, you know, here you go, we'll take the payment for order flow, thank you very much.

But as a result, we expose our -- we tend to expose our orders to a lot of different counterparties. I know at least -- I know at least a couple of firms on this panel, not specifically the people, have said, oh, can you please just make us number one on your list? And like I can't -- we won't do that.

And so I think it's not a bad thing, but it's not necessarily the optimal thing.

MR. MAYHEW: So the question of order preferencing is a perennial issue. For decades, we have been talking about what is the impact of order preferencing. A lot of that discussion has been in the context of equity markets. And I think if your regulatory question and your concern as a regulator is the question how if at all does order preferencing impact market quality, how does it impact the quoted spread in an ostensibly quote-driven market, we have a lot of evidence over the years that we can look to as

informative evidence from other markets. Not as much from the option market, but there is some pretty interesting research going back to when Nasdaq was not an exchange but was a network of dealers that were quoting. And there's research on how preferencing impacts the incentives and the tendency of dealers to quote aggressively, and the extent to which the dealer quote attracts order flow.

I think it would be a good exercise for the Staff to go back and look at some of that, that old research on Nasdaq and over the years.

With respect to option markets, there was an interesting thing that happened in the early 2000s. You know, before that, option markets had a structure where a single market maker in the crowd would disseminate the quote for that exchange. And if a marketable order came in, there was a wheel or an allocation mechanism where any market maker in that crowd would share, according to a formula. And then what happened? Well, ISE came in with a different model where any market maker could put their own quote in the spread and they would only get the order if they were at the best quote, and they had a narrower spread than anyone else and they got huge amount of market share. And a couple years later, all of the other floor-based exchanges changed their rules

so that individual market makers could get their quote in the spread.

Overnight -- I was at the Commission at the time. I looked at the data. Overnight, the quoted spreads on all the floor-based exchanges dropped significantly when you introduced competition across the market makers for narrowing the spread. So I think the lesson there is that the more an individual market maker can attract order flow by quoting a better price, that gives them the incentive to quote a better price. And that matters.

The question of -- then the question becomes to what extent does preferencing or directed order flow weaken or undermine that incentive. You know, in theory there's an argument for why it might undermine that incentive. Again, the massive amount of research in the equity markets suggests that there might be some effect there, but it's not -- perhaps it's not a major concern.

MR. MANOHARAN: Great. All right, for our next question, let's discuss the possibility of order-driven markets. Outside of the most liquid symbols, resting orders are less common for options than they are for equities, in large part due to the number of listed series. Nevertheless, maker-taker fee models and customer priority models seek to incentivize the posting of customer orders.

Are there any impediments to attracting more liquidity, adding customer options orders? What could be done to incentivize them?

Andrew.

MR. SCHULTZ: Thank you. I'll just start with letting Steve have a cup of his coffee and say that, you know, the U.S. markets are, in fact, the envy of the world --

(Laughter.)

MR. SCHULTZ: -- and we've seen a growth that has been quite remarkable with our quote-driven markets. We've talked about kind of how many quotes are out there.

I think the thing to think about is that market makers cannot control the concentration of the products that they trade or exactly how they trade. Aggregators are generally responsible for all the exchange-facing fees, so the distinction between lifting the market and posting the market may not even be fully apparent to the customers.

Approximately half of all the single order volume is marketable. Meaning customers are regularly receiving executions inside the posted screens on those other halves.

Mechanisms such as flash and complex auctions allow customers to access liquidity without needing to focus on whether they are taking or posting in any given market. In addition, trading platforms may employ algorithms that initially post an order for a short period of time but ultimately cross the spread if a timely execution is not achieved. So the quotes are there to provide it, but I think the customers are kind of thinking about what I want to trade and at what price I want to trade and aren't necessarily concerned with the exact execution style that that trade requires.

MR. MANOHARAN: Nathan.

MR. DUCKLES: I think we largely agree that I think it would probably be misguided to think of customer posting liquidity as a vector for deepening the limit order books, just given the number of quoted series that there are. It's probably best most of the time to think of, you know, customer non-market limit orders as just a demand for liquidity that they are seeking a better price on rather than actually an attempt to deepen -- you know, deepen the markets. And, you know, there is no real fee structure that is going to incentivize a meaningful amount of customer liquidity on millions of options series at any given point. So I'm thinking of it mostly as just, you know, an attempt

to secure better execution on a wider market when they're posting, rather than, you know, added liquidity is probably correct.

MR. MANOHARAN: Stewart?

MR. MAYHEW: Well, if you measure whether the option market is a quote-driven market or an order-driven market by the number of quotes it disseminates, it's definitely a quote-oriented market. But I found interesting numbers in the supplemental data that was provided by the Trading and Markets Staff. They had a couple of tables showing marketable orders, execution quality, nonmarketable limit order execution quality. And adding up the numbers in the rows, it looked to me like there was about 50 million customer orders that were nonmarketable limit orders and about 20 million orders that were marketable. So that -- while it's true that if you pick a random series and you look at the limit order book, it's going to be empty. Well, the median trading volume across options series is zero. So vast majority of the strike prices and maturities on many, many series, there's no customer limit orders there because there's no trading volume on that series.

When somebody does want to trade, as Andrew mentioned, it's very common for them to trade by submitting a nonmarketable limit order inside the

spread, so that the price that's determining the trade occurs is not necessarily the quote but it's the order. So in a sense, options are an order-driven market, not really as much of a quote-driven market as we say.

So I think as the Commission considers possible policy rulemaking or amendments or anything like that focused on competition across market makers, they should consider both types of competition; competition to quote narrower spreads, but also structures that enable and encourage market makers to fill nonmarketable limit orders inside the spread, as well as competition in the option mechanisms that offer price improvement inside the spread.

MR. CRUTCHFIELD: I'd hoped to add a lot of fresh stuff here, but I've got to say that most of what I was thinking was already said. You know, to the -- the one thing I will sort of add is there is like an exception where it in some ways is almost order driven. First of all, Stewart, I agree with you a hundred percent on the wider markets. It becomes order driven because somebody puts -- somebody establishes that I want to pay this or offer this. But there are, I think, in some of the most liquid markets, I'm going to call them quasi-market makers who are in some ways -- I can't really tell if they're quote driven, order driven, or somewhere in between because in some ways they're sort of quasi-market making in the sense that they're posting tight, two-sided prices, which may or may not be order driven, may or may not be price driven, that mimic that behavior.

So there's -- I don't know that I want to dwell too much on the distinction, because I think it becomes, you know, certainly to Stewart's point, a sort of blurry topic at some level.

MR. MANOHARAN: All right. For this next topic -- I spent a lot of time reviewing this one -- let's talk about competition in retail price improvement auctions. Price improvement auctions have a variety of different fees and features that assist an initiator in gaining a greater allocation of an order. There are fee differentials between initiators and responders that make auctions more expensive for responders. Auto match allows initiators to match better priced responses, and breakup credits are given to the initiator when their order is filled by someone else's better priced order.

Do these features, as well as potentially others, impact the willingness of other market makers to respond with an improved price to an auction?

Steve again.

MR. SOSNICK: Well, I am glad you invited me

to speak on this topic. We are immense users of auctions. You know, that's one of the ways that we believe we can best foster competition and competition, we believe, gets the best price for customers.

We do this through our routing mechanisms, and we route to over 20 different liquidity providers from whom we solicit, you know, auction responses from. So, to the extent that there's incentives for using auctions, we take advantage of them too.

And I thought that there were some great statistics in the paper that was presented. As spreads widen, it's in many ways the best way to get customers a best execution. Yes, you don't need an auction if it's a penny wide. You don't need an auction on an at-money, SPX, zero-dated call. It's irrelevant. It does matter when the spreads widen a bit. And you could see from the paper how much more price improvement could be gained from customers by using this auction mechanism. So we -- you know, we've got our own statistics toward this, but I'm glad that a source like the Commission can prove this point for us to some extent.

And so, right, I mean, if spreads were always a penny, we wouldn't have this discussion. But they're not. And there's plenty of good reasons why they're not across all items. But this is a topic we feel quite

strongly about and we advocate their use and use them heavily.

MR. MANOHARAN: John Kinahan.

MR. JOHN KINAHAN: I think as a straightforward answer to your question, if the fees matter to an auction responder, they definitely do. And fee differences between the solicited side and an auction responder, they're significant. And this is an extremely competitive industry. Fractions of a cent count. The difference between a highest tier solicited -- the paired side of an order and an auction responder are, you know, it can be a very significant amount.

So again, from a simplistic standpoint, like if the idea was to make that auction more competitive, make it cheaper. And again, I don't mean to harken back on my comment on the five lot topic, but that would have complications to it. That type of change wouldn't exist in a vacuum. You would see auction dynamics change as a result of it.

But, you know, the simple answer to your question, yes, they matter.

MR. MANOHARAN: So make it cheaper for the responder?

MR. JOHN KINAHAN: Yeah.

MR. BROWN: So I think as it relates to

auctions, it's probably a tale of two cities. You know, auctions are, as Steve pointed out, a critical tool to provide customers with meaningful price improvement opportunities beyond the displayed quote. And I think that's accomplished in a variety of ways, right? The ability of auctions to trade at prices that have greater granularity than their quoted NPV, and the fact that the auction is in fact broadcast to all participants who potentially want to provide price improvement.

I guess if the room is willing to indulge me a little bit on the nerdery of the auction, though, if you think about a typical like retail auction work flow, it's going to be typically a customer initiating parity with an away market maker, right? And economically speaking, if that's a customer, that typically is zero fee. There's a contra fee that's generally anywhere around a nickel, high single digit pennies. But that participant often times is tiered and is subject to a customer rebate as well. So what looks like a five-cent charge is probably a seven- to 12-cent credit depending upon the exchange. And that happens irrespective of whether the order is interrupted or price improved or not.

But in the circumstances when the order is price improved by an unrelated party, the portion of the trade that is broken up, there's also a rebate that is received on top of that. So if you take a look at initiating fee plus initiating credit, plus the breakup rebate in relation to a participant that's price improving and probably paying 50 cents, for example, in a penny name, the difference there is well north of half a tick. And so from an intellectual point of view, one could argue that that likely would frustrate someone's ability to be as competitive at each price point because of that variance in economics.

Now, I think like none of this can be, you know, done in a vacuum. And perhaps that does create a structural impediment. So things that we could think about doing is sort of rationalizing that differential. You could also take a look at it and say things like auto match potentially could also frustrate competition in one way, shape, or form.

The thing to think about from that point of view, though, is that whatever we do again, just like five lots, also has to be coordinated and holistic. Because if every exchange that operated a price improvement auction eliminated auto match, for example, except for one participant, you know, one exchange, then a lot of flow would go to that one exchange.

So I think those two things have to be

obviously, you know, balanced. And I think the fact that the Commission has this data to study where it is appropriate to leverage price improvement auctions, as Steve talked about, in most liquid names perhaps not, I think that should be taken into consideration in light of some of these other suggestions.

MR. MANOHARAN: Nerdery is a great word. Go ahead, Steve.

MR. CRUTCHFIELD: I was going to say the same thing. Thank you. Always trust Ivan for the best nerdery. Meant as a compliment.

MR. BROWN: I'll take it.

MR. CRUTCHFIELD: So first, I liked the way Steve kicked this off. I think markets are great market structure, highly appropriate for the options market, where we do have a less natural confluence of buyers and sellers simultaneously than could exist in equities. There's often an opportunity for price improvement. The statistics bear it out. It's great that we have them. It's an excellent boon for the ultimate customer experience. Always an opportunity to improve design again. I would look to competitive dynamics. Ivan and John both spoke a bit about the fee disparity that exists, and I agree with the points that both of them made.

The design of auctions does strongly and intentionally favor the party that initiated the order flow. And building on some of the things Kevin said earlier, certainly full disclosure, I had a voice in the design of some of these mechanisms historically, so I certainly have some skin in the game there.

But I think that the incentives could be improved, so I will build on Ivan's comment a little bit about auto matches, is the topic I wanted to focus on. So just a reminder for everyone or those who may be less familiar, the way that auto match works -- we call it auto match. There are different names for it. But typically the egregious example would be the market on the screen for some option is $1 bid at $2. A customer comes in and is willing to pay 99 cents in some option, the trade is in penny increments. The initiator says, okay, I'll sell it to you at 99 cents. I'm going to start an auction.

Somebody else could respond to that auction and say, I'm going to sell it at 50 cents. The initiator has the right to automatically have their price updated to 50 cents. So they get to participate on the auction. And uniquely, they are the only party that has this entitlement by automatically matching response prices.

It pretty obviously diminishes their incentives to provide the best price out of the gate. I think you could argue a better market structure would likely be one where all participants had the maximum incentives to show their best price, rather than sort of waiting for someone else and saying, well, you know, if he does, then maybe I'll do it, too.

So that's the skewed incentive. And, as Ivan said, it's competitively very difficult for exchanges to move away from this incentive because once it existed on one market, it's a powerful incentive, again, for parties that control the routing of flow to go to that market in cases where they have a desire to interact with that order.

So overall, would recommend a review of whether the auction incentives for initiators, both pricing and allocation advantages, are appropriate to the unique value provided by the order initiator, with a particular focus on, in my view, auto match is kind of the most obviously distortive thing in that family of incentives that impact an otherwise very good market structure mechanism.

MR. SELWAY: Could I just ask a follow-up on auctions? So we talked about auto match, we talked about pricing. Are there any other details, you know,

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sort of data connectivity, frequency, timing, you know, that we should hear about as we consider?

MR. SCHULTZ: I think one thing kind of related to that and the timing in the auto match is the aggregators or the committed party is starting that auction 100 milliseconds before it actually trades on the exchange. So my -- on the auto match, that is a large discrepancy, certainly in some of the, you know, fast-moving products. And so these auctions, unlike some of the other trades, you know, if a quote moves or someone, you know, doesn't -- you know, cancels an order, auctions are almost guaranteed to trade. Nearly 100 percent of those things trade.

And so I believe that that auto match and that 100 millisecond timer, those offset because the aggregator is adding liquidity and/or adding price improvement. You know, you could have a market that's 1, 1.10, 2 up, and you could start an auction for 100 in order to provide extra liquidity and extra kind of price improvement.

I think the move from blind to nonblind was a positive move that you mentioned.

MR. FISCHER: Yeah, I think aligned a lot with what Andrew said in terms of evaluating the length of an auction period, the initiating market maker is at a

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disadvantage when initiating an auction, given that they're committing to provide that capital 100 milliseconds in advance. So I think the ability to respond by auto matching does take into account the fact that the market is moving and other market makers could choose to participate or not. And that initiating market maker may want to change their price and match.

I think overall, though, we are open to evaluating price improvement auctions and I think it is worthy of a review. They are the primary mechanism to provide price improvement for retail orders, so I think that's very important. But it's worth evaluating whether or not they've -- their use has changed, versus what was originally intended.

And then just quickly to touch on the pricing mechanics. I think agree -- agree with all of Ivan's math in terms of the overall fee structure. I think the one major exception there or outlier there is that it didn't take into account the payment that was provided by the initiating market maker to take on that risk and bring in the retail order to the market, which offsets all of the fee differential that's been raised.

MR. TYRRELL: I was kind of following up on fees, and I kind of concede some of the point of auto match and how it could be tough for an exchange to kind

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of buck the trend there and gain share.

But, you know, on the fee structure especially, that's not an SEC rule. Right? That is, of course, where the market is right now. But again, with 18, soon to be 20 exchanges, I think there's a lot of room for innovation. And if there are, you know, better ways to do it that would result in better outcomes for customers, I think given the involvement of so many firms handling customer order flow with exchanges, either direct ownership or just even good relationships, there's a lot of opportunity there to come up with a new mechanism outside of, you know, SEC rulemaking.

MR. SCHULTZ: I do think you could take that timer down. I remember when it was three, and then it went to one, and now it's 100 milliseconds. You could easily make that 10 milliseconds and most of us are using electronics, computers to respond anyway. And so the difference between 100 milliseconds and 10 milliseconds wouldn't change much.

MR. SOSNICK: If I just may, I don't want to quibble with some of the ideas for improvement. Because, you know, yes, we've steadily taken down the amount of the timer. But the one thing I will say is, I can understand the need for improvement. Just don't mess this up for the customers. Because the data shows

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-- and your data showed this -- well, your colleague's data showed this. There is a lot of price improvement here. And make sure that that is -- however we do this, just make sure that price improvement quality does not diminish as the rulemaking may evolve. Please.

MR. SELWAY: Well, it's investors' data, because it's from CAT. And I can't miss an opportunity to point that out.

But Steve, I did want to ask you, it's fascinating that most of your clients choose pro from light. So when you quantify the benefit of using auctions and doing, you know, the nerdery to optimize options, what does that look like vis-a-vis your light clients, if you could say?

MR. SOSNICK: You know, the numbers exist. I don't have them at my fingertips. It's meaningful enough that they're willing -- it's greater than the amount that they would save by just routing orders. I should have brought that number with me as a follow-up. I don't have it, Jamie. I'm sorry.

MR. MANOHARAN: Am I allowed to say I use pro? But not for options.

MR. SELWAY: And now he will.

MR. SOSNICK: And other panelists have told me that as well. And other people in this room have told me that as well, so there you go.

MR. MANOHARAN: All right. For this next topic, let's talk about another execution venue, the trading floor. What's today's use case for physical trading floors for multi-list options?

MR. TYRRELL: So when we look at our floors and look at the activity there and talk to the users of those floors, both the market makers and floor brokers and also all of the upstairs users of those services, what we generally see and what we generally hear is that the floor is handling larger, more complicated orders. Where electronic execution either isn't ideal or may not even be possible, at least on certain venues or through certain pipes. So, you know, this means a lot of multi-leg, very large orders.

When we looked at our data, 75 to 80 percent of everything that happens on our floor is some sort of multi-leg or, you know, tied to stock type of trade. So these are not just simple outright trades, there's a lot going on there.

And we've heard from, you know, several upstairs users that having that extra set of hands on that order at the actual point of execution can provide just an extra layer of really risk management and allows the folks on the floor to getting the last bit of the

execution done. Those upstairs sales traders can focus on what they're doing and working with their clients. So it's sort of a helpful bit of the ecosystem for them.

And when you think about what would the alternative be, you know, handling some of these large, complex orders in electronic systems, it can introduce some risk, but also can introduce, you know, additional fees or burdens. So you would have to build or buy or use, you know, algorithms to execute these orders. And in practice, many people are doing, you know, a little bit of both, using both the floor and electronics. But, you know, we kind of hear that there's still a nice use of the floor for some of these larger ones where there is more risk involved.

In terms of competitive dynamics, one thing we've seen on the floor is certainly a mix of how many orders come to the floor with kind of the order already matched versus not. And I think there's a perception of some people that everything that comes to the floor is matched. And we don't see that. We see some partially matched. And we have some segment of flow that is coming to the floor really looking for the floor market makers to provide liquidity. It's solely one sided.

So there is sort of a lot more going on there than just paired orders coming down and sort of getting

printed on the tape.

And there are -- kind of just one last point on the electronic side of things. There are a lot of electronic mechanisms, some auctions to some extent, that are trying to replicate some of the interactions or benefits of the floor experience. And, you know, we've seen in many cases sort of modest uptake. Right? The market has grown tremendously; the floor has not grown at the same pace as overall options volume. But it has sort of more or less kept up. You know, it's losing share overall, but it hasn't disappeared yet. The competitive dynamics haven't pushed it away.

So I think over time, as electronic tools, if they were to get better, if they were to adapt more or be adapted more by the industry, we may see the floor lose share sort of more organically, sort of like we saw in the equities market, where the market kind of moved beyond the floor. We haven't really seen that yet. And I think we may see it in the future, but I think we'd rather let the market decide that than any sort of exogenous force.

MR. MANOHARAN: Go ahead, Andrew.

MR. SCHULTZ: A few years ago, Susquehanna submitted a comment letter recommending that all trades be exposed electronically. At that time, there were two

fewer trading floors. And we continue to support that position today.

In the current environment, we believe that electronic exposure where any interested party, participant, can respond will result in better and fairer executions for the end customer and provide fair access for the entire trade.

Floors are attempting to recreate the electronic auctions. But we believe they are doing so less efficiently. Price discovery for block size liquidity is overwhelmingly achieved upstairs before a block is presented to an exchange. Because the floors almost never price improve on an exposed block order price but merely rather seek to participate at the proposed cross price. This is not adding liquidity but rather taking it while providing little market value.

A modified approach could include establishing a minimum size for floor trades. There are already electronic restrictions in place for solicitations in QCC trades. For example, a requirement that any trade under 500 must be exposed electronically would help ensure best execution for the majority of retail trading, while still allowing trading floors to provide pricing and liquidity for larger and more complex trades.

Lastly, we believe that any type of clean cross rule would go against all of these points. It would block participants from possibly providing better prices.

MR. JOHN KINAHAN: I think whenever time I hear this question, my first question is, well, what are we going to replace the floors with. And I think Andrew brings up the idea of, you know, creating an auction mechanism to expose these types of order flow. I think we'd have to think very carefully about how that auction mechanism gets structured. But it could theoretically work. And I think that could be viable if done correctly.

If the alternative is to just close the floors and allow that type of order flow to be clean crossed or even an expansion of, you know, the ideas behind QCC, I think the industry should be very wary of that. I think, with all acknowledgement to the role that like brokers and solicited market makers and facilitators -- with acknowledgement to the role they bring to the marketplace, the marketplace needs a check. And I think the role of the floor right now is to provide that check.

MR. SCHULTZ: We have those mechanisms, though. Aims and Pixels and PIMMS and all those would

just work. You can just put those in electronically.

MR. JOHN KINAHAN: Understood. But they don't get used in that fashion today. And things may change between, you know, where we sit today and that world where they get used.

MR. FISCHER: So we have a unique perspective on this. We have one of the largest institutional market makers in options. And then we also have participation and presence on all of the options trading floors. And I think with that view, it's unclear to us that the options floors continue to provide the benefit that they once did.

I think that's evidenced by COVID. When all options floors closed, we saw an improvement or increase in price improvement, versus price improvement on the floor. And I definitely would welcome the SEC to study that further. I think that the data that was provided today was interesting. But looking at the subsegments of equivalent activity executed electronically in an auction versus on the floor and what price improvement looks like would be beneficial for the market.

We all -- we do have specific concerns around the floors as well. So there are a few activities that warrant review. We see internalization of small or retail-size orders on the floor as a major issue.

Orders being shopped around floors to minimize participation is a major issue. As well as exchange policies that are intended to limit market maker participation is a problem.

So I think, you know, with that, similar to what Andrew said, we're supportive of looking at mechanisms to migrate activity away from floors into electronic mechanisms that could be done through a cap such as a 500 contract or a minimum threshold such as 500 contracts, and kind of start there.

I think as others have said, and I think as maybe all of the panelists will likely say, a clean cross rule would certainly be problematic, and we would caution the SEC in considering that. I think as the SEC has done in all of their rulemaking, evaluating the impact to displayed price discovery with approvals of certain new mechanisms is warranted. And that would certainly be the case if you were considering a clean cross rule.

MR. CRUTCHFIELD: Yeah, I agree with most of what's been said, and particularly with almost everything that John just said.

I think you could make a case -- I'll just mention this, because I don't think anybody else has, that in single list products where there is a natural

liquidity concentration on a single floor, for example SPX -- there are others -- you could make the case that that's a reasonable process. You're going to bring an order to be placed and that is where the liquidity is and that is where the market makers are. And that -- that actually does provide some pricing benefit to investors.

But focusing then mainly on the multi-list products, which I think is what most of this conversation has been about, just a kind of a note on the structure. Floors right now, as I see, really exist in sort of a regulatory inadvertent gap through the confluence of three things. We require orders to be exposed in the options markets in almost every case, with very limited exceptions like QCC, which I would also not want to see expanded.

We count announcement on a floor as exposure, just like laying the order down electronically. And liquidity seeking orders don't ordinarily go to floors. So almost everything of note that goes to a floor, I think candidly, even if it is looked at on the floor as being liquidity seeking, it was already shopped upstairs and if they didn't find the other side, it's because nobody cared at the price. It's not because the floor is providing additional value.

So electronic markets are extremely efficient. So basically the only reason that orders go to floors is when someone is looking to internalize a big cross. And it's become very obvious over the years, and I don't think anyone will disagree, those orders tend to go to the floors where there is the last friction tends to be I think the term of art. Those orders are seeking low-friction crossing opportunities.

Yeah, I'm getting some agreement up here.

So what happens on the floors is market makers have to spend money to put people on floors so that when an order goes to that floor seeking a low-friction cross, there is an opportunity to potentially participate, maybe provide price improvement, but typically I think most of that price improvement again happens upstairs. And exchanges then, through no fault of their own, and I've been in this situation as well again, exchanges have an adverse incentive to compete for flow by making the floors as frictionless as possible. And that is every exchange, while potentially getting more volume on their floors, is always about how can we make this quicker and easier and faster and less likely for there to be market -- those annoying market makers who get in the way of these crosses that we want to be able to print on our floors.

What does not happen on floors is price discovery and multi-lists. It's just not happening.

So for the vast majority of orders, I would certainly agree with Andrew. By the way, at CTC, my former employer also signed that letter, if we're talking about the same one. It's many years ago, now that I think. But certainly would recommend that, for the vast majority of orders, mandatory electronic exposure should be the goal. I don't think we need to let the perfect be the enemy of the good.

If I were to humbly make a recommendation, it would be that the SEC should signal a moratorium on approving additional trading floors. As Andrew said, the number of floors has grown after many years of stability, first with Box, then with Miami. We do not need any more.

But if the regulatory's position continues to be that it's okay, floors are a perfectly cromulent place to trade options, then inevitably IEX and MEMEX and the Texas exchange will open floors in the next small number of years. And I think that would be to the detriment of market structure.

MR. BROWN: I will just add that we're going to focus on launching first. Not so worried about the floor.

(Laughter.)

MR. MANOHARAN: All right. So we recently had another roundtable to discuss the trade-through rule for equities. But options are not governed by the Reg NMS trade-through provision but rather by an NMS plan. Is a trade-through restriction still appropriate for options?

Katie?

MS. KOLCHIN: Yes. So I will go back to my comments at the beginning. You know, options differ from equities. Big one, when it comes to trade-throughs, there is no off-exchange trading. Right? So if the original intent of the trade-through rule was to ensure that investors are getting a great experience, let's look at that. We've already discussed, and I'm going to be the first who says it the second time on the same panel, but retail has never had it better. So they are being served very well.

If you think about the institutional side of the concerns around executing large orders, I know we just had a healthy debate about floors. But they do have a floor option. And I'm sure if floors were to go away, the creative minds up here would find a way to service that customer set well, just as retail is served.

So I am also going to go back to my beginning

comments about that equation with the revenue opportunity, but also the cost side of this. And this is where options is similar to equities.

So any removal of the trade-through restrictions is not going to guarantee that the firms sitting up here are going to be able to disconnect from exchanges. It may not alter the cost side of the equation.

So the question becomes, not just on this particular one but sort of what we are getting at all day to kind of sum it up is, what is the problem we're trying to solve for here? And what results will we anticipate would come from any changes we would make to market structure? And then how would we measure those results if we do implement changes, and then what would be our plan to adjust accordingly as we continue to monitor the environment as it changes? And I think John was kind of getting at this. What if we make it worse for people?

So I think that's just sort of my way to end -- this is my last segment today to speak on -- to sort of end for the day. Again, what is the problem we're trying to solve for? Before we come up with any changes. Even though I know Jamie and Richard have made it clear this is more of discussion rather than a rulemaking today, but just to end with that.

MR. MAYHEW: I mentioned earlier that nonmarketable limit orders are sort of a crucial way that customers can obtain better prices and price improvement relative to the spread in option markets. And I think one thing that facilitates that is the display rule and the trade-through protection that they're given through the option linkage plan.

You know, one of the explicit stated goals of the national market system is to seek to allow, where possible, orders to -- public orders to interact directly with each other without the need for intermediation of a dealer. That goes back to the beginning of the national market system. And that may not happen a ton in option markets, because it's so fragmented across so many series that there often dealer intermediation.

But a trade-through protection in option markets feels to me to be very consistent with the goals of the national market system and empowering investors to get their limit orders executed by getting them displayed and having them protected. My understanding is the exchanges have already sort of hard coded into their rules and into their routing logic the ability o reroute orders where there's a better price. So I think

it's operating pretty seamlessly is my understanding.

MR. TYRRELL: I'll follow up on one thing Katie said, the cost line of this. And I think this is probably similar between equities and options, in my opinion, that if you were to introduce some sort of change to the approach today of all exchanges have this protective quote, I don't think a lot of exchanges or any exchanges go away, and I don't think costs reduce. But I do think, looking to the future, as we keep -- there's certainly an incentive to keep adding exchanges. And I think you'd have to think about how do you handle the upside or the growth in costs. And we're very cognizant that, you know, fragmentation is a bit of a cost for us but I think it's much more impactful to most of the other folks up here.

So I think it's worthy to ask is it right to have a protected quote and an obligation to connect to a venue on day one of that venue. Or do you need to have a proving ground or a proving period.

And we haven't really seen this approach in options. But in equities, we've certainly seen ATSs start, you know, go from zero to something substantial as an ATS, and then become an exchange. IEX obviously followed this path very successfully. And the market structure is different, so it's not a perfect analogy

that it could necessarily happen that way in options. But I think there are kind of things that are worth thinking about if you need to clear some hurdle for the protected quote. Or to, you know, Citadel's points that they've made, to get the protected quote and/or abilities to charge for certain products. You know, maybe that should not be sort of open to anyone who gets the filing in and starts an exchange, you know, from zero.

MS. KOLCHIN: If I could just add onto that, it goes back to what I did in the beginning where I did that 1 percent market share threshold. And in equities, you've got seven of the exchanges are under 0.5 percent market share. Yet you're right, Kevin, that from day one that they open a door, they're collecting market data and connectivity fees. And that's one of the things that I would put on a list, a question we should be asking, how do we stop that.

MR. FISCHER: Yeah, I think just to expand upon that, I know I mentioned in my opening the 200 million estimate for the impact of the industry from small venues. I think, yeah, the exchange proliferation is a major cost to the industry. You know, we are at 18 options exchanges with 20 expected by the end of the year. So a lot of that is driven by the benefits to

launching an exchange. So there is ORF, which was discussed earlier. There's fixed connectivity and data fees as well.

So we did an analysis to look at, you know, how do we come up with this 200 million number. So we looked at all venues under 4 percent market share, which in options, given everything trades on exchange, that's a slightly different number than what we've used previously in equities. And we looked at the ORF they collect, as well as our estimates on the connectivity and proprietary market data fees that they charge. And that number is substantial. It is a major cost to the industry.

I agree with the other panelists that simply changing a trade-through rule wouldn't address this cost, given that most industry participants are already connected to these venues. And as an order router, to fulfill best ex obligations, you likely need to continue to connect to those venues.

So I think the potential solutions that we've proposed previously are evaluate a market share threshold for participation in CIP revenue, evaluate a market share threshold for exceeding certain connectivity and market data costs as well. Which, you know, we hope should curb some of this exchange proliferation.

MR. DUCKLES: The fact that all these exchanges have above 1 percent of the market share, I think we should treat as evidence that they are actually serving a real purpose here. It's not just, you know, de minimis. And to the extent that we've already talked about how, you know, reforming ORF has decreased at least some of the sort of unnecessary cost of proliferation.

But if you want to look at why is there this incentive for the new exchanges, and part of it is, to go back to our first topic, that they represent -- they are serving a real market need of a more competitive specialist allocation process. And so having that process be more competitive and more ongoing, I think, would at least reduce some of the artificial incentive that currently exists for those new exchanges.

MS. KOLCHIN: And just for the numbers, for the below 4 percent, when I pulled these data, it was nine of them are below 4, and then there is a tenth that's right at the 4 percent. So almost half are below your 4 percent number.

MR. SCHULTZ: One quick point on John's point about the best ex. I do feel like if you did something where exchanges under 4 percent or 3 percent were not

considered protected in the options market, we don't actually believe it would impact the prices that the customers achieve, because I think the customer firms are evaluating whether it's EQ or liquidity. And so whether that seventeenth, eighteenth, and nineteenth exchange is at 1.09 or not I don't think actually changes kind of how that execution would happen.

And then one other one to John is that there are massive fixed costs, too. I have a feeling that might be near 200, but you didn't say it. So I point it out.

You know, the connectivity data center boxes, cross connects, all that, are a real burden when you start to go from what was five exchanges to now 18 and soon to be 20, and I guess 21 soon.

MR. SOSNICK: As a former market maker, I will say that is probably the biggest impediment to having new market makers come in. There's a big cost. There's a big cost to starting a market making firm. And that's not shrinking.

MR. FISCHER: And to speak to the numbers too, so, yeah, progress has been made with ORF. In our estimates, ORF was 25 percent of that $200 million number. And agree with Andrew, the fixed connectivity costs are a major portion of the number.

MS. KOLCHIN: Yeah, and just to Steve's point, that was what I got at in the beginning. Like I think a very important question here is have we made the ante way too high for new participants to come in, or even people to remain in the business, given all the costs in the industry?

MR. SELWAY: So I got the sense there are a couple of sellers of QCC up here. Anyone want to take the other side, or argue the counterpoint?

MR. TYRRELL: Sorry, to QCC?

MR. SELWAY: Yeah, the qualified -- the exemption.

MR. TYRRELL: I think, I mean the one thing we are I guess cognizant of, QCC to me is part of it, is at this point it has kind of been brought up a couple times over the day on a couple different things. It's great to think that the options market has order interaction. And obviously, QCCs are different. But providing tools like that where overall the market is, you know, focused or sort of biased towards exposing orders, allowing market participants to participate is great. And I think, you know, a far better situation than the equities market where so many orders, retail orders -- you name it are not exposed to an exchange and are not really broadly available for trading.

So, you know, I think QCC is helpful in the sense that, you know, broadly, we are still keeping this exposure. You know, there is a carve-out for a particular type of trade. Certainly understand, you know, concerns if it were to be, you know, expanded or the clean cross type order type introduced. You know, obviously, people would have concerns with that.

But overall, I think maintaining tools that allow the ability of most orders to interact in the exchange world is a positive thing. So it's something we think about in terms of that particular capability.

MR. MANOHARAN: All right. For our last question today -- and it's been a great panel. Finally, for our last topic, we are going to talk about liquidity, specifically quote width.

Outside of the most liquid symbols, quotes seem to be wide and getting wider. What can be done to facilitate tighter quotes?

John.

MR. FISCHER: Yeah, I think a key question to ask there is what aspects of market structure create excess complexity and costs for market makers? And ultimately, that results in wider quotes. So we think there are a few areas that are worth evaluating there. One is capital frameworks and the fact that they're not always sufficiently risk based in evaluating the full risk of your portfolio. Within that, I think there's alternative net capital rules and their availability to market makers is an issue worth evaluating, as well as allowing model-based risk controls as part of that.

Also clearing fund methodologies or clearing fund allocation and margin methodology is worth evaluating, you know, to ensure that they're better risk based.

Strike proliferation, which is an issue that has come up today, is another issue that impacts market makers and ultimately results in wider quotes.

I think roughly half of options series have zero open interest, so there are nearly two million strikes and half of them have no open interest, have never traded.

And we also think, you know, as said earlier, worth evaluating auctions. I think they are -- again, they clearly are the main mechanism to provide price improvement to retail investors. But at the end of the day, if it's deemed that they are resulting in wider quotes, it's worth evaluation.

MR. MAYHEW: If I could just expand on some of those ideas, think about what it means to be an option market maker and how options are different than stocks.

I mean Kaite mentioned some of the things.

One important way in which an option is different than a stock is that an option market maker is quoting 100 or 1,000 or multiple thousands of different series on the same underlying. I looked the other day, I think Apple has 3,200 different series, over half of which did not even trade on the day I was looking at it.

And the option market makers have exchange obligations to maintain most of the time two-sided quotes on all of these series. And then there's other market makers on other exchanges quoting those same series. And any time your spread on any one of those 3,200 series is going to cross with some market maker on some other exchange, there's someone out there who could pounce and try to do an arbitrage against your two quotes. Or if your quotes are stale and not updated frequently when the underlying market moves, you're subjecting yourself to arbitrage.

So there's sort of a question of what is the optimal width of your spread that you're going to quote on thousands of series that never trade, given that it's costly to update. You have a complex, model-based system that you're updating the parameters of to run your auto quote system. And, you know, does the Commission want to strongly incentivize market makers to

aggressively compete on narrower quotes on series that never trade? How much resources do you want to dedicate to that.

So if that's the reality, then as you think about what type of competition do you really want to focus on? I'm not saying it's unimportant to consider encouraging competition across quotes. But it becomes more important to really ensure that there is robust competition after an order arrives to allow market makers and other market participants to wake up and say, oh, somebody actually wants to trade this option. How much price improvement can we get? So focus on the auctions, focus on what effects does exchange proliferation have on the ability of market makers to offer price improvement to marketable orders. Perhaps other ways of focusing the competition, rather than imposing additional risks and costs on market makers for quoting series that never trade.

MR. MANOHARAN: To follow up on that, would a periodic or one-sided auction be useful?

MR. SOSNICK: One-sided quotes, you mean? Or --

MR. MANOHARAN: One-sided auction. So an auction would just start, and so if someone -- so it wouldn't need a market maker to start the auction.

MR. SOSNICK: Go ahead, Andrew.

MR. SCHULTZ: I think that would hurt the displayed liquidity. It would hurt the prices that are shown on the screens. And I think you would have potentially even wider screens in a way, because those quotes are out there. And to Stewart's point, the one thing I would add is those 3,000 quotes have often very, very correlated risks, too. If the Apple stock moves and their calls and puts tilt is -- but, no. I think if you did that kind of open auction, you'd potentially hurt the screens even more. And it would be very hard for investors of any type to understand what the kind of pricing of that option is. You can just imagine a world where like an entire expiration in Apple could go, you know, no bid at 50 and there'd be no sense of what the volatility is or what the real risks are because there would be kind of no trade on those quotes.

MR. SOSNICK: You know, I'll answer the question and I guess get to my point, if you don't have a follow-up on that.

I think it's important here to realize that, you know, there is a disincentive for market makers to quote too tight. And I think we don't want to further disincentivize them.

To John's point, one of the things that I've

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thought about for years is I know strike mitigation has been a topic forever. But if we still have one million out of two million strikes that have no open interest, I will argue we have too many strikes. And from a market making point of view, I understand this because I did this plenty, is you can't put your best foot forward on every strike all the time. It's impractical. And you know, especially now that the statistic was what? We went from 3,400 to about 8,500 quoted names, each of them have multiple strikes. Do we want to be moving high delta options? You know, at some level, you're just increasing more quote traffic without a lot of benefit. So I do think that's important.

And what we do is we use the auction mechanism to mitigate that. Beyond that, we actually basically have market access controls that prevent customers from trading off of too wide of a spread. We -- to a certain extent, we won't put in an order if it's too wide of a spread. We will seek liquidity at a better price for them.

And part of it is also education. At any given point, we pretty much know what the fair value is of that option, even if it's a wide spread. The wider it is, the harder it is to determine. But in any given case, you can pretty much figure that the midpoint is

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the fair value as far as the Street has determined. And we go to a great extent to educate the customers to say, look, you know, here is the fair value on this option. You know, let's say it's 10 bid at 20. Okay. So, you know, you're probably not going to get it if you bid 15. But try 17, try 18. Odds are someone -- one of these guys here will hit you if you're above -- if you're above his fair value. And that's the way we try to do it.

And so I think that it's a bit of an art as much as a science. I think a lot of it is on the brokers, because I don't know that we can rely upon the market making community and the -- and just the amount -- and just the pipes to manage, you know, if we had tight spreads on every single line everywhere.

MR. CRUTCHFIELD: I think a question or a useful way of thinking about this question is what are my incentives as a market maker to marginally improve some wide spread in some illiquid thing? And what are the things that I would worry about that are disincentives to doing so? And I think some of them have already come up.

John Fischer made the point a couple of times, which I agree with. Generally -- and you asked about one-sided auctions. I think the response was, you know,

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a little negative. I would agree with that. But I would also say I think you could make all those same points about two-sided auctions. Right? I mean any time you have an auction mechanism that allows someone to jump up and improve the price beyond the quote, in a way you're disincentivizing putting that quote up there in advance because it doesn't have a participation entitlement.

Now, there's an important balancing act there. We want customers to get those better prices that they are through auctions as a market structure mechanic. But there is that risk.

So am I going to improve the quote? Well, when the order comes in, someone is just going to start an auction anyway. And maybe I could just not improve the quote and respond to the auction. And then, you know, why am I sitting out there? Conversely, if I am sitting out there on the quote, I do have this risk that I am going to get picked off by someone whose price feed is a couple of microseconds faster than mine.

By the way, I think there is a solution there, which is allowing exchanges to be creative and, you know, having the regulators sort of stand out of the way as exchanges try to do interesting things. We supported -- I shouldn't say we -- my former employer supported

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the work that IEX has done along those lines with market makers protections. Other exchanges have looked at other things, speed bumps and other market mechanics that can reduce that pickoff risk.

And then the third does get back to something that we spoke about extensively before, but it is the question of allocation. It used to be why do I want to improve my quote? Well, I'm on a pro rata market and if I show 10 and then, you know, an eight lot comes in, maybe I'll get a couple and that's a good order, I want to trade with that order.

Nowadays, as I spoke about a lot previously, up to five contracts, I'm never going to see that order. Because whoever controls that order is probably going to send it to another exchange where either they or their affiliated market maker is a specialist and is entitled to trade all of it. And that's true even if I improve the quote. Right? I can improve the quote, they can match it, and now they get the order. I never see a single contract. Why am I exposed to potentially lose on those more toxic fills.

So not -- you know, a lot of issues at work there. But there are -- I think a lot of the things we touched on earlier could help to improve the story about better incentivizing market makers to improve quote quality on screens in some of these less liquid products.

MR. SCHULTZ: Can I just mention one thing, sorry, on the strike mitigation versus the strike proliferation? I was on LOMSWG and it took a couple battles about the mitigations, and it didn't always go well. But I will say that there is a large amount of friction in adding the strikes kind of intraday when the moves happen. And so I think while we do have lots of strikes that don't have open interest, we have an environment that allows the customers, institutional or retail, to make the trades they want even when news comes out. So there is a balance between the two.

I actually think that we've reached a reasonable balance. You know, when the markets move 10 percent or 15 percent over a two-week span, you kind pick up strikes and there's not much you can do about it. But I think there is certainly a friction of going too low on strikes, because then that product is not available to trade. And that's real hedging costs and trading opportunity.

MR. BROWN: I was just going to say on the strike rationalization part, you know, Steve and Andrew make a good point. This has sort of been a longstanding topic for a period of time. Ellen Gigante, a number of

folks on the Listed Options Market Structure Working Group have tried to tackle this.

I would say as a practical matter, it's very difficult -- actually impossible for exchanges to actually coordinate on this particular matter, as you can imagine, for antitrust concerns. And so I think this is an area where some direct initiative from the Commission to help support a more intelligent strike regime and rationalization might be a very practical, you know, practical application.

MR. SELWAY: So floats like a butterfly, stings like a bee.

Please join me in thanking Arun as moderator and these wonderful panelists.

(Applause.)

MR. MANOHARAN: And if you have more to say or if our audience has some thoughts, the comments file is open.

MR. SELWAY: So we're going to take a short break. Be back here at 11:30, please.

(Recess.)

MR. SELWAY: All right, so welcome back. We're going to go ahead and get started with our second panel.

I am pleased to introduce to the group Deputy

Director Jon Kroeper and Eric Juzenas, who is associate director leading our Office of Market Supervision.

The next panel will focus on evaluating the customer experience with listed options. So Eric and Jon, take it away.

PANEL TWO

EVALUATING THE CUSTOMER EXPERIENCE

MR. KROEPER: Great. Thanks, Jamie.

We had a great first panel, hopefully we can live up to that. And I'd be interested in hearing if anyone wants to share their spirit animal. Butterfly is taken.

So over to you, Eric.

MR. JUZENAS: Thanks, Jon.

First, any volunteers on spirit animals?

MS. RUSSELL: Mine is a swan, actually.

MR. JUZENAS: Swan? All right. I was thinking I'm going to go with orca.

Okay, so this one is going to discuss the customer's experience with options and a focus on the retail customer. I think as we heard on the first panel, there's obviously been a huge growth in retail trading. Also to get people drinking their coffee, I'm going to change a little bit, you know, our markets are the -- I forget. What was the actual phrase? The envy

of the world? I'm going to qualify that by a little and just say that the national market system really is the envy of the world, because I think one of the factors that was cited by several people, including Katie, was when it comes to the options market, the breadth and, you know, some might call it fragmentation, but the fact that you have numerous exchanges with significant volume. And that was obviously one of the goals of the national market system way back when.

But also what makes our markets the envy of the world is obviously the customer participation. And so I think that's why this panel is a nice follow on from the previous one, because we talked about, you know, some of the emerging issues and some of the challenges. But now we're going to really try and hone in more specifically on the customer experience.

So our panelists today bring a wealth of experience and varied perspectives on options trading. They have been carefully selected and vetted to make sure the conversation is going to be entertaining and hopefully, you know, not too much tension but some tension. And we're going to start with an introduction to the panelists, starting with Geralyn.

MS. ENDO: Hello, everyone. My name is Geralyn Endo. I am head of options business development at MEMX. Thank you to the Staff and to the Commission for hosting an Options Market Structure Roundtable. Yes, I do remember the ISE. I hold it very near and dear to my heart. It's where I started my options career. But here I am now at MEMX, also referred to as the Members Exchange, which was founded by many of you in this room or watching back in 2019.

Our mission is to create healthy competition among exchanges, as well as advocate for market structure reform that results in a more efficient and effective trading experience for all participants, including customers. MEMX currently operates one U.S. equities exchange, one options exchange. And, yes, we will be launching a second exchange later this year, contributing to that increasing count. And we also provide technology to other market centers.

Since I know Steve loves his coffee. You changed it on me a little bit, so I don't know what to say. But the U.S. options market is the envy of the world. The customer experience has never been better, resulting in the significant growth that we've all been benefitting from.

While certain incremental changes certainly may prove to be beneficial, any fundamental market structure changes simply are not necessary. We should

focus our efforts on the current industry-led initiatives.

Thanks, and I'm looking forward to continuing the conversation with everybody.

MR. HOSTY: First of all, I just want to say thank you to Chairman Atkins, Commissioners Peirce and Uyeda, Director Selway, and the rest of the SEC Staff for convening this roundtable on such an important topic.

I'm grateful for the invitation to participate on the panel. I am Ed Hosty, vice president of execution services for Robinhood Financial and Robinhood Securities.

As an initial matter, we want to emphasize that option trading, and specifically retail participation in option trading, has existed safely for decades. Every day investors use option strategies for prudent reasons, whether it be to hedge current positions, generate income, or manage risk with greater capital efficiency.

Representing Robinhood, I am proud of the role that we played in democratizing access to the option market for a new generation of retail investors. The options market has fundamentally transformed. Lower barriers to entry have led to a record breaking 15.2

billion contracts traded last year, largely as a result of retail participation. This unprecedented participation is a success story that should be celebrated and protected.

During our discussion, we must acknowledge the options marketplace is dramatically different than the equities market. The market structure is very, very different.

To ensure customers get the best experience possible, we urge the SEC to take an evidence-based approach to any possible changes, rather than rushing prescriptive rules that could effectively limit retail access. Instead of broad structural overhauls, we believe our immediate focus should be on solving three organizational challenges that directly impact the market and everyday investors today.

First, the options regulatory fee. We appreciate the steps taken by exchanges already, but we'd like to see further transparency and accounting for what and how these exchange fees are used, and if they are unnecessarily burdening retail customers.

Second is strike proliferation. Up to 60 percent of listed options are ghost strikes with zero daily volume or zero open interest. These unused strikes strain the system and create targets for bad

actors. Culling them is essential for market integrity.

Finally, operational resilience. Disruptions to data feeds and delayed obvious error rulings leave retail investors exposed to unacceptable financial risk. By addressing these immediate issues and fostering responsible innovation, we can preserve the unique strengths of the options market.

Thank you. And I look forward to the discussion.

MR. JJ KINAHAN: I'm JJ Kinahan, Cboe Global Markets. I guess I have unique perspective in my opinion. I've only been at Cboe since January. I was a market maker for many, many years, then went to work on the retail side for many years. Basically, I'm saying I'm old. And now on the exchange side.

Much to Crutch's chagrin, I think we have to change the logo for this panel and the spirit of it to retail traders have never had it better. And we'll change it from coffee to whiskey. It's almost noon somewhere.

But anyway, no, all that said, quite honestly, I think we have to be, echoing a little bit of what I had said, very careful about some of the things we do. Can the market use improvement? Absolutely, of course it can. Everything always can. But I think you have to be very targeted in the things that you change. Because as, you know, my cousin John was up here a moment ago saying some of the things that sound actually simple really change a lot of the infrastructure that's related to it. There's a lot of interdependence in how these systems have been designed. And so because of it, as we consider what we do, I would say we really have to consider not only that thing we are changing, but all the downstream effects. I think one of the things that we've all been guilty of is not necessarily doing in the best way before some things have been changed in the past.

That said, if you look -- any business is judged by the success of its end user. Well, I remember being in meetings -- you know, it was interesting, when that chart was up earlier and it showed how market makers went down in 2016, 2017, 2018. Many of you in this room will remember we were sitting in meetings and our biggest concern is how are we going to get younger people interested in the markets. It's not a surprise to me that we saw market makers leave the market then, because the volumes looked like they had tapered off and may be even starting to fall a little bit.

Then, of course, in 2020, we didn't think every young person was going to come at once. But they

all did. And it was the best thing that happened to our markets. And if you look at volume measured from 2019 until the end of last year, OCC volume is up over 200 percent. I don't think there are many businesses that are 50 years old where that is happening. So again, it's awesome.

And I should have started it -- my mother would have slapped me -- with a thank you for everyone having this panel. It's absolutely important. you know, options have been something -- anybody who knows me knows I'm incredibly passionate about. And it's great to see options get their day in the sun, if you will, with the SEC, and considering how to improve the markets.

But again, if you're going to measure any business by its end user, I think any business anywhere in the world that's more than 50 years old would love to have a 200 percent lift over the last six years.

MR. MILITO: Hello. I'm Stino Milito, the president of DASH Financial. I too would like to thank the SEC for organizing today's roundtable and inviting DASH to be a part of it.

DASH was founded in 2010 as an agency-only executing broker. Our routing technology is designed to efficiently navigate today's complex options market

structure while providing our clients with full transparency and control over their orders.

Our clients include global investment banks, market makers, retail firms, broker-dealers, institutions. So we pretty much touch all market participants.

In 2025, on average, we executed 15.5 million contracts per day, representing approximately 25 percent of the daily OCC volume. Thank you for allowing me to speak today.

MR. POMEROY: Good morning. I am Nate. I am principal at Wolverine Execution Services. I'd like to thank the Commission also, and Commissioners and Staff for inviting us today. I always love talking some option market structure.

WEX is an agency-only executing brokerage with offerings in EMS algorithmic execution focused on options, OMS products, as well as high-touch execution in options specifically.

I have worked at Wolverine for my entire career, and very early on learned about this new sort of product that we were building at WEX called the smart order router that focuses on retail options execution. I've been working on that product for basically my entire career and like to tell friends or new

acquaintances that my day job is to try to figure out how to save ordinary Americans millions of dollars a day, which is kind of cool.

And, yeah, looking forward to participating with everyone on this panel today.

MS. RUSSELL: Good morning. I am Racquel Russell, SVP in FINRA's Office of General Counsel, where among other things I'm responsible for options policy in support of FINRA's investor protection and market integrity mandate. I have been with FINRA for 17 years. I started my career here at the Commission in 2001 in the Division of Trading and Markets. And thank you to the Commission and the Staff of the Division for having me here today and I look forward to the discussion.

MR. SCHWARZ: Good morning. My name is Christopher Schwarz. I am a professor of finance at the University of California Irvine. I am officially here as an academic, but I actually am a retail options trading customer of many of the firms on the roundtable today. So rather rely on anonymized or voluntarily provided data, my coauthors and I perform experiments. We place the same trade across multiple brokers at the same time -- with our own personal money, I should add. Over the last two years, we placed 20,000 option trades at nine brokers across two dozen symbols at various trade sizes. By doing so, of course, we know the broker we placed the trade at, we know which wholesaler handled our trade, we know which exchange our trade went to, we know it was executed, auctioned, unbundled, split allocation, and we know what price we paid. And then we use those trades to do research on the economics of the retail options microstructure markets. So it's based on those academic findings and experience as a customer, on which I will make my comments today. And so I thank the Commission for having me here today.

MR. SIKES: Hey, everyone. I'm Stephen Sikes. I'm the COO of Public, and I am the CEO of our broker-dealer and sort of deal with all of our capital markets and markets and market structure issues, especially from a policy perspective.

First of all, thanks to the Commission for hosting this. I remember in the prior administration having many conversations at the SEC specifically with Commissioners Peirce and Uyeda about how the attention paid to equity market structure in the last administration might have been better placed here. So I'm very excited that we're here to talk about the options market.

Because while I do think we do have the best market we've ever had for retail investors, there's

certainly lots of opportunity to improve and we shouldn't, you know, let better be the enemy -- or perfect be the enemy of better -- however you want to say that, whichever way. You guys know what I mean.

Anyway, just being from Public, we're a relatively young retail broker. Let me give you a quick second on who we are, and I think that'll inform many of the conversations and my points of view as we go through, and I think having that grounding will be helpful.

So in the highly competitive space that we operate in, we differentiate by focusing on serious investors and traders. And while we can make that distinction between serious and nonserious in many ways, I think what we like to say is we serve investors and traders, not gamblers. And so we do that specifically focusing on two different sets of things. One, ensuring broad access to multiple asset classes. Effectively, every asset class that we can imagine a serious retail investor or trader incorporating in their portfolio, we want to show them in the Public experience. So that's, of course, equities, fixed income including corporates and treasuries, the options market and the crypto market. And again, there are many others as well, and we are going to continue marching on that path towards

just broad asset class selection.

The second thing that we focus on is enabling access to the best tools and data available. And one of the things I think will be interesting as we talk about investor education and options specifically is how the use of AI for both research, portfolio construction and strategy construction is increasingly becoming important to helping influence better retail investor outcomes.

Generally speaking we are relatively young, but we have been a part of these, you know, market structure conversations for, you know, going back to GameStop era, if I'm being honest. And our goal in all of these market structure conversations is the same: to help retail investors get the best deal possible, the lowest cost of trade, the best execution quality, and so on, regardless of the asset class they participate in.

And we don't do this because we're altruists. We do this because we think that's the best business. It's the best business for two reasons. One, better cost structure, execution quality, and transparency allows us to compete effectively and acquire customers on the basis of the quality of our products in a heavily and highly competitive and very expensive market to acquire new customers. And the second is, maybe intuitively for everyone in the room, the better

outcomes an individual investor has with their broker, the more they're going to invest, the more they're going to trade, and the longer they're going to stay on that platform.

And so while there's a tradeoff between optimizing for short-term revenue against sort of taking some of these more long-term oriented steps, we believe focusing on the long term, you know, allows all these factors from customer acquisition and better outcomes to compound into the best business possible.

Thank you.

MR. JUZENAS: All right, thanks everybody for those introductions.

And so the first topic is account opening and investor education. As we've talked about previously, retail investors are trading options and even beginning to use more complex options trading strategies. In light of this, what considerations and best practices should broker-dealers consider when authorizing a customer for options trading. In addition, what resources are available to educate investors about options? And how can industry raise the awareness of the unique aspects and risks of options?

And we're going to start with Racquel.

MS. RUSSELL: Thank you. I think it's really important to take a step back and talk about this threshold stage in a retail investor's participation in the options market. And so let's talk about the baseline regulatory framework and what the effective practices are.

Opening an account, there are some rules of general application that will come into play. Know your customer, account information, you know, margin accounts. There's margin disclosure. But we have FINRA Rule 2360, which is an options-specific rule. And that rule lays out, among other things, some kind of basic due diligence that a firm has to undertake when it's looking to review and approve or disapprove a customer for participation in the options market.

And when we talk about this, we've been talking about the landscape of options market participation, and including retail participation. And an important thing for retail customers is having information for their account opening to be right sized to what they seem to be aiming for from an investor aim perspective, as well as other things that the broker-dealer takes in to learn about where this customer is.

So for example, 2360 requires the firm to look to collect information on the customer's investment objectives, their age, their income, net worth, their

employment status, and their experience in trading in general, in trading options in particular, how long, how frequent. Things like that are key bits of information that the member can then use to review the application and then ask -- they're required to consider what level of trading is appropriate for this customer and whether the requested level is in alignment with the information that they collected about the customer.

So if you have a customer that's looking to preserve principal but they're looking to engage in like level five options trading, that's something to explore.

And, by the way, firms generally use five or six levels to describe the degree of risk and complexity to options trading.

So once the firm gathers this key information, the firm undergoes the determination as to whether or not the customer will be approved at all. And if so, for what level of trading.

And then there's disclosure, which is also very important. The broker has to provide the options disclosure statement. But at a minimum, depending on the level approved, the broker may also need to provide supplemental statements like a statement referred to in Rule 2360 as the statement for uncovered options. So if they're going to right uncovered options, there's a

particular additional disclosure statement needed there.

So this process is needed whether or not the account is a self-directed account. It's for every account that the firm is permitting to trade options. And we've looked closely at what firms' practices are in this space. And firms have a lot of different practices that they've tailored to their business. Which, you know, is always fine. Some firms use more automated processes, and some firms use more manual hybrid processes to review and approve the options accounts.

But regardless of what process a firm uses, asking certain questions will help the firm get to a place where they have best practices about their program. So, for example, does the firm have minimum review standards for approving the account at all? If the account is to be approved for higher levels of options trading, are there enhanced requirements in that case? Like are there minimum years of experience or exposure to different types of products that come in advance of that?

Whether or not the firm is reviewing for red flags. I think Ed mentioned the fraud concerns in the space of zero DTE. This baseline information helps later as the firm is overseeing the activity that's occurring in the account. So do you have someone

applying for an account that says they have 10 years' experience but they're 21? Or their employment is a student, but they make a half a million dollars a year. Is there -- are there any red flags just that are observable either from the information that the firm already has about the customer in other contexts, or just logical inconsistencies in the application?

And if the firm reviews these on a fully automated basis, is there a process for testing later on? Are there ways that the firm is embedded to look for potentially erroneous approvals?

And so all of these things are important to that baseline experience that hopefully sets the customer up for a more right-sized and informed experience with trading options.

And you also mentioned investor education, which is very important as well, obviously. And, you know, the Commission's data describes, I believe, about 70 million individual customer accounts that have traded options already. And FINRA has a very robust investor education program in the FINRA Foundation, does periodic surveys. We have one that was put out in December of 2025. And part of that looks at options in particular. And as I think we've already acknowledged on this panel, it does skew younger.

Options retail participation skews younger. Forty-three percent of 18 to 34 year olds trade options as compared to just 10 percent of those that are 55 and over. And, you know, in alignment with that age, it also skews less experienced. So 33 percent of those with less than two years' of investing experience trade as opposed to 13 percent of those with 10-plus years' experience.

And the survey, in addition to kind of that general sort of demographic information, also includes -- we call it a national financial capability survey, so it includes substantive questions to try to assess understanding of fundamental concepts. And there are a couple of questions that indicate that there are mixed levels of understanding that people have, even if they are actively trading options.

So of the respondents that are actively trading options, only 22 percent responded to the call option question correctly and 54 percent answered it incorrectly. And the margin question, only 18 percent answered the margin question correctly and 70 percent answered it incorrectly. So, you know, that demonstrates that we all have some opportunities to help investors sort of be more informed.

And, you know, FINRA has increasingly looked

to diversify its approach to investor education. We have a lot of publications, including specific options-focused publications that are available on our website. But we also do in-person outreach, whether it be through libraries or senior centers. And increasingly heavy social media presence to kind of get people in the different demographics. And, you know, social media, videos, and articles and, you know, trying to get to investors that way.

And another good thing that came out of the survey, which is an opportunity for the member firms, is that 75 percent of the survey respondents said that they use the materials that their firms provide and that they rely on the tools and the resources that they can get through their broker. And so that means that there is an opportunity for all of us to work together to try to close that understanding gap.

MR. JUZENAS: All right. Thank you, Racquel.

JJ?

MR. JJ KINAHAN: You know, we at Cboe take education very, very seriously through our Options Institute. I think any good brokerage firm or options exchange has built themselves by education, quite honestly. We do our education in six different languages. Last year we had people from 139 countries

use the education. We do thousands of webinars, including 1,100 with partners, many of whom are speaking at some point today.

Doing options education has really morphed. When I first started back at Think or Swim in 2006, I was flying around the country with a projector and a computer going to ballrooms and doing it. Now you're trying to get somebody's attention in 15 seconds on a TikTok, so that you can get them further to explain how an options vertical spread works. But it really is amazing how well people are doing it to engage the retail client overall.

Everybody has a great interest, be it if you're on the brokerage side, the exchange side, the market maker side, in making sure that these clients are educated. Because if they're educated, they are going to stick around for a lot longer time.

So I think as an industry, we actually have a responsibility to make sure that people are as educated as possible and you turn them to all the resources.

The other amazing thing is how great the education is. And it's free. And that's really one of the biggest changes in the industries over the last 20 years also, is all this great stuff that is done for free. And, you know, again, we want to make sure that

when people come to the markets, as Raquel just talked about, there's all these different tiers et cetera at the different brokerage firms. You want to give people the opportunity to move up their tiers as they get more experience, they get more comfortable with the product overall.

I really think that the industry is doing a good job of it. Obviously, you want to be doing a great job of it overall. But people are anxious to use the resources that are out there. But again, the challenges -- there's two big challenges for it, number one being, as I jokingly said, but quite seriously, how do you get somebody in 15 seconds of a TikTok to suddenly take an interest?

Like I said, when I started doing this, we did them for five hours. Now we do webinars for 20 minutes. And you're hoping to get people -- and obviously, we do a lot longer ones also. But you're hoping to get people to interact. We did 164 different topics at the Options Institute last year. And you want to make sure that you're just getting in front of people as often as you possibly can. Because in the long term, they'll become better investors and they will use our products. There's nothing more satisfying than seeing somebody go from doing a covered call to doing a vertical spread, to doing -- we've talked about butterflies, so why not? And iron condors. And, you know, so that people start to use all the different products. It's great for everybody. And if you look at the amount of complex trades that are happening on, you know, coming from the brokerage firms, I think that's also a great measure of how well we're exceeding -- succeeding, I should say, in terms of the education that everyone is providing.

And as well as I think sometimes it's lost on people that complex trades in many ways, particularly vertical spreads, are usually good because it means people are defining their risk. Which is a great thing overall for the markets.

MR. JUZENAS: Thanks, JJ. And I think that one point you hit on there is that there is a certain element where there is so much material that there is more of this education that is self-directed, too.

So Ed.

MR. HOSTY: Yeah, we want to make sure to hit both topics here. I think the first one about account opening, I think what, again, we want to be careful on is whenever the topic of account opening comes up, it's generally an indication that people, or some market participants believe that there might be a problem with such a process.

What we want to be clear about is that we want to make sure that retail engagement remains high and the customers that are looking to trade options or are trading options are best informed and can utilize to the best of their abilities.

So I think we think it's extremely important for broker-dealers to have an intense understanding of their customers and the evaluation of them and their suitability to trade options. We don't think the benchmark there remains the same for everybody. It's not -- necessarily doesn't have to be prescriptive. But broker-dealers should have flexibility in how they accomplish that. I think -- that's the one piece.

The second piece on investor education, JJ's right. Customers are everywhere engaging with content for options -- all of our asset classes, actually, be it on platform, off platform, across platforms with things like the learning tools offered by Cboe.

Robinhood is really, really cognizant of -- we don't want to just democratize access to markets, but we want to empower these customers to make the best choices they can. We want to make investing understandable for them in the ways that lands with them. What this means is that we generally have to be everywhere.

Our customers are different than other

people's customers on this panel, other people that were on the first panel, and the third panel. What we understand is our customer and their needs.

For education, we want to meet them where they're at. We are doing things like short form videos, learning articles, in app experience guidance is huge, giving them an understanding of sometimes how these things play out is huge for customers.

What I do know it's dramatically different from is the way in which we had traditionally taught options or relied upon rule sets to teach options, and things like characteristics and risks of standardized options. I don't know the last time somebody probably read that end to end. JJ might have been the last one 35 years ago.

(Laughter.)

MR. HOSTY: So we want to make sure our customers always have the best information, and they demand it of us. That's going to continue to change and morph as we go on, especially with the adoption of AI. And we just want to make sure that they have everything that they need.

MR. JUZENAS: Thanks, Ed.

Stepehen.

MR. SIKES: I absolutely want to echo a lot of

what Ed said, meeting investors where they are. You know, I think anyone who has been plugged into the options world both recognizes the quality of some of the TikTok videos and then also the dangers of some of the others. Right? And I think that's, you know, something that we have to grapple with as an industry, is that there is an entire third party ecosystem, you know, introducing retail investors to options strategies that are technically correct but maybe, you know, the risk profile of this specific opportunity that's being described in a given TikTok video might not be strictly accurate.

Far be it from me to exactly identify how we should change our regulatory environment to improve there. But I will give one tactical, forward-looking thought.

One thing that we've seen at Public is we've begun, as I alluded to in my intro, to build a bunch of AI-forward products to help our investors, you know, both research strategies, educate themselves, and ultimately starting to move into more effective strategy execution. And as we've done so, we've run into a few different, you know, reasonable societal and regulatory questions about how we should grapple with AI from an educational perspective in that experience.

So let me start -- like tell a little story. Right? Let's just imagine again -- not everyone here, probably most of you haven't used Public's AI products. But let's just assume that there's something that's roughly equivalent to a Claude or a ChatGPT that is nested within the Public experience and has access to a customer's, you know, account information and a bunch of really, really high quality market data and other information.

So let's say, and this is an exact work flow that we've seen many, many times from our members, and you'll sort of understand in a second where the issues are that we might need to grapple with as an industry.

So a customer comes in with a broadly diversified portfolio, but with an understanding that they want to let's take maybe two of the more healthier use cases in the options market, they want to generate income from their existing portfolio because they have a present need and they, you know, still believe sort of the underlying equities but they want to generate some income. Or they want to protect some risk because they're -- again, they have a short-term or a near-term cash need, and therefore they want to change the sort of overall deltas or the overall risk of their portfolio.

Again, two things there I think retail

investors actually become in this recent -- the last few years have become deeply aware of the opportunity to use options for those ends. But let's say they're not the best at executing them when given an options chain. Right?

AI can be incredibly helpful there. So when a customer comes in and says, hey, I'd like to generate yield from my portfolio. How might I do that?

Now let's think about our Claude or GPT-like experience nested within a broker's UI. What's the answer we want to see there?

Again, I could make an argument that the next answer should be let's say you want to protect the portfolio. The answer might be, hey, you should evaluate -- you know, I've looked at your portfolio. You should evaluate, you know, you're more tilted toward tech so you should evaluate QQQ puts that are 30 to 45 days expiry, you know, because you've told me there's some time horizon that matches that, and maybe you should look 5 to 10 percent out of the money. I think that's probably a pretty helpful educational conversation for a retail investor to participate in. It'll help them actually clarify exactly what they want in the moment, how they can execute a strategy according to their intent.

But there's also a world where that's a recommendation on behalf of a broker-dealer. We don't know what recommendations are. You know, everyone knows, I think, is familiar with sort of the facts and circumstances of recommendation, but I would say, hey, that's more tilting towards education and that's a sort of specific high-quality education we should want to see. Again, well supervised and governed within the experience of a broker-dealer, especially, you know, accurate execution.

Now let's take it a step further. Right? The customer -- so the AI gives the response about 30 to 45 days expiry, 5 to 10 percent. And the customer says, oh, well, what specific options should I look at in that realm.

Now, I could make an argument that the response there should be a specific set of, you know, using the available market data, it should be a specific set of expiries and strikes and should give a rough idea of the liquidity in each of those and where would be the optimal place to execute the intent that the customer wants. And I would argue is that a recommendation or is that a screener? Right?

So as we think about where the AI is taking us over the next several years, there's these questions

about how you might treat those different conversations. And what we ultimately should arm retail options investors, retail options traders with to help them actually just have better outcomes and better match their intent with the execution that they choose.

And I think there is a huge opportunity to do it well. But I think as we look at that technology and the way we're implementing it within Public, we're nervous. Right? I don't know that we know how to answer those questions. And frankly, I think that we can make a really strong argument that that's a positive sum outcome for retail investors. It is education followed by a screener, and that's wonderful, and it's going to lead to much better outcomes for our investors. But I can't guarantee I'm not going to end up in a, you know, regulatory matter addressing recommendations through an AI in three years. And that's hard.

You know, I think we have to grapple with the idea that there are some of these difficult questions in how we deploy education versus how we, you know, regulate our broker-dealers in terms of recommendations. And I don't know that we're having that conversation. Again, I think we're very early to this space.

But I would say as we leave and we talk about education in the retail sector, we have to -- you know, we have to assume a world where the AI we have today is the worst we'll ever have and the quality of that AI creates new opportunities for how to better educate retail options traders.

MR. JUZENAS: Thanks. And thanks for that overview of an issue that is only going to grow from here, I think. And so that was helpful.

We're running a little bit behind. We're going to move on to the next panel. But just encourage people to try and limit their remarks to a couple minutes.

So the next topic is payment for order flow. As people here probably know, retail brokers generally use consolidators to execute their retail order flow and then reserve payment for order flow or PFOF in return.

Unlike equities, because OCC-cleared options have to trade on an exchange, the consolidator really doesn't have the ability to execute off exchange with or without price improvement.

So the question for the panel is what impact, positive or negative, does PFOF have on the retail customer experience with options? And we're going to start with Chris.

MR. SCHWARZ: So, you know, I think the PFOF model, having it is definitely a good thing for

customers. Right? So certainly some customers are better off under the fee-commission model. And I'm sure some customers are better off under the PFOF model.

You know, with that said, one of the issues with the PFOF model is it takes very salient fees and commission costs that customers can see and turns them into hidden PFOF execution-related costs that they can't see. So if you look at our total trading costs in our experiment, about 70 percent of those costs are these opaque execution costs that currently retail customers have no idea how to measure because, as far as I know, outside the data in our paper, there's simply no public disclosure about that information.

And the variation across brokers is huge. So if you look at the highest quality fills that we get from one broker versus the lowest quality fill broker, it's literally the entire quoted spread is the difference in our fill price, on average. And so we try to figure out what that was correlated with. And it's almost perfectly correlated with the amount of payment for order flow. Right?

And again, these things are completely unknown to customers. And, you know, this kind of came up on the first panel. But, you know, exasperating this issue is kind of this ambiguity with regard to best ex.

I remember when we got six different prices at six different brokers at the same time. My first question to someone at FINRA was, how can that be consistent with best execution? And so if you read the rules and notices with plain language, it's not particularly helpful. Right?

So FINRA Rule 5310 says, my broker has to go to the best market and get me the best price. Are brokers who use the wholesalers and execute their trades on the same exchanges not in the same market? FINRA Notice 21-23 says almost unambiguously that a broker can't negotiate payment for order flow that impacts execution quality. But yet our correlation is near perfect. So it's kind of hard to reconcile those rules and notices with kind of the findings of our paper.

It seems to us the only thing that's really binding in terms of execution quality is Rule 611. And if that were abolished, to be honest, I have no idea what the lower bound on acceptable price improvement would be for customer trades.

Now, so the bottom line is I think the PFOF model is great. It gives consumers choices. But there shouldn't be preference given to how costs are disclosed to investors over one business model over the other. Right?

And so on a pretrade screen, you know, fees, commissions, and estimated execution cost should be on there. Statements, trade confirmations should have execution costs included. And I'm going to be honest, we either need to strengthen what best ex means or we have to tell retail customers, hey, it's up to you to get to the best price, because the broker only has to get a good price, not the best one.

MR. JUZENAS: Thanks.

Geralyn.

MS. ENDO: I thought I'd take a moment and step back and define an aspect of payment for order flow for everybody here. We also in the options space, we refer to it often as the marketing fee. And it is a little bit different than in the equities space.

The marketing fee is actually posted on exchange fee schedules where it's charged. What that means is that the fee is transparent and reviewed by the SEC.

At a high level, the marketing fee is charged between customer transactions that trade against market maker transactions. So for example, a market maker on a trade against a customer gets charged by an exchange 25 cents in a penny name. That 25 cents goes into a pool to the respective market maker. And then at the end of the month, the market maker decides and tells the exchange where to disburse those funds.

This collection and allocation is negotiation of funds. There are change of hands of funds. It happens independent of how the retail order is actually executed.

MEMX, MX II launching later this year, as I mentioned earlier, we intend to not have a marketing fee on our exchange. In general, fee schedules are designed to attract liquidity and ensure displayed quality of market. The marketing fee is simply one component of how the retail order actually gets executed.

MR. JUZENAS: Thank you.

Ed.

MR. HOSTY: I think we wanted to speak on PFOF in the -- what we generally understand is that our best ex obligation exists no matter what, and it is to do best for customers at order entry. And I think that's -- what that generally is driven by is a product of the customer base that we have and the way that they engage with the market.

We really, really respect the relationship we have with the consolidator intermediaries, because of their -- A, they have that same obligation. And, B, some of the burden that would otherwise be put on

somebody like an end Robinhood to have to maintain some of this architecture is put in an appropriate spot and actually delivered by firms that know this business intimately inside and out.

What we strive for is a competitive environment that can reward people for the performance that they give our customers. And what we see is that it works. And the prices that they receive is generally driven as a product of probably what the value of that order flow is for an intermediary. But in general, it is -- we have a competitive environment in every type of asset, whether a wide market or a tight market. And what we see is customers get really good results.

I think that when a customer will see they get an execution price and they see a total price for that transaction, that's largely the same. We don't have multiple line items, we don't have a commission charge. We have an ORF fee. So that does come into play. But there is not a commission in addition to another built-in cost or anything along those lines.

We think that the customer outcome is very clear to them as they get that execution, and very easy for them to see without any -- without having to go hunt and search and figure out the total cost to transact.

MR. JUZENAS: Thanks, Ed.

Nate.

MR. POMEROY: Just I'm going to hazard a joke to start, which is that if Kamala Harris was an option market structure practitioner, she might say that payment for order flow did not simply fall out of a coconut tree but exists in the context of all that came before it.

(Laughter.)

MR. POMEROY: So let's see. To start, I think it's very appropriate to frame PFOF in the consolidated model as part of a relationship that is primarily driven by the execution quality statistics that WEX and our competitors like DASH and others deliver to our customers. I'd say over 99 percent plus of retail order flow that we handle is directed to certain consolidators based on the execution quality statistics that we deliver.

There's also a massive expectation of consistency in that deliverable, both intraday and across symbols, and across days and across months. And at times even like quarters or multi-year horizons.

So we view that as kind of the primary factor in which we win order flow. And our affiliate, Wolverine Trading, has to deliver a significant portion of the vast majority of that price improvement to our

introducing broker-dealer partners on a daily basis.

So every day for WEX or for DASH, we kind of start the day knowing that we are going to be on the hook for some amount of payment to our introducing broker-dealers, which is not an area of competition between us. Those are fixed rates between all the different venues that an introducing broker-dealer might choose to route. And we know that we're going to be competing on execution quality, which is going to mean delivering a significant millions of dollars of price improvement to those customers. And that's primarily going to be handled by our -- or provided by our affiliate, Wolverine Trading.

In that context, I think it's important to see this -- see the model overall as in some ways an end-to-end revenue share between the introducing -- the customer themselves, in the form of an improved execution, the retail broker-dealer that is collecting a payment for order flow, and then the executing consolidator and their affiliate.

How those dynamics end up playing out I think is extremely competitive. We've seen really aggressive performance in terms of the effective over-quoted spreads that we and our competitors have been delivering for the past five years. We've seen dozens of percentage points of improvement as ourselves and our competitors continue to want to gain market share, want more order flow at increasingly better levels for those customers.

And to kind of finalize and conclude these things, I think it's important to note in this consolidator context that while Wolverine Trading will route orders to trade with their affiliate, it's not as large of a number as you would potentially think. And there's robust competition for WEX order flow between all market participants.

So this should inform, I think, the Commission's view of some of the topics that were covered in the first panel with respect to things like specialist allocations, auction allocations, things like this. Like Wolverine Trading is on the hook for millions of dollars of price improvement every day for sure, and they're going to have to backstop that to continue to receive another order from a Schwab or Robinhood. They're the person who's always going to have to take the stand in that context. And while other market participants might try to participate, they have the option not to.

So in the context of say like auction mechanisms, that's to us the negative selection or, to

Wolverine Trading, the negative selection or the last look. There's almost a sort of reverse view of that wherein like every other market -- every other market participant has the ability to say I'd prefer not to trade at that price level. But those consolidators, their affiliates, ultimately do have to provide that. So I don't think you can really contextualize some of those prior conversations about that interaction and that relationship as being anything other than ultimately to the benefit of those end customers in the form of improved execution quality that we've seen in this industry for the past -- as long as I've been in the business.

MR. JUZENAS: Thanks, Nate.

Stephen.

MR. SIKES: Eric, I will respect your request and keep it brief.

I really want to echo what Chris started off saying, which is PFOF is likely good for the market structure. But the lack of transparency is a real issue.

Even sitting in my seat, managing, you know, retail flow, it's maddeningly difficult for us to understand the specific relative execution quality that we receive as a broker-dealer for our customers. We do

what we can, but there is very little third party or publicly available information about what competitive execution quality looks like. And therefore understanding the interplay of rebates, PFOF, and execution quality.

Again, it's maddeningly difficult because of a lack of transparency. And I really respect the work that Chris is doing to try and bring that transparency to retail investors who have even less information and less understanding than we do.

As we entered this business two years ago because of that context, we decided to go with a no-commission and rev share model with our customers on the rebates that we receive, the PFOF that we receive from our wholesalers, we rebate that back to our customers. They receive, you know, incremental dollars every trade and every contract they trade. Because we couldn't find a route where we had a lot of confidence that trading off on the rebate we received would yield dramatically better EQ.

And while I totally believe that that's the relationship that Chris sees, sitting in my seat it was very hard to build an operational model where I could be very confident that that would be true. And so we took the sort of guaranteed transparent route, because that

was sort of the opportunity that we had in front of us where we felt the most confident we were living up to our best execution obligations. I mean, again, aligned with our own business interests as I described in the outset.

So, you know, something like SEC 605 reporting for venues, brokers, wholesalers in the options space, you know, we would welcome it.

MR. JUZENAS: Thanks. And my remark was not directed to you. I thought the information you shared, it's just that Jamie said John and I's performance review is going to be based if we keep everybody on time. So it's really about us.

MR. SIKES: Dozens of dollars on the line. I get it.

MR. JUZENAS: All right. Stino.

MR. MILITO: So I don't see PFOF as a flaw in the system. You know, I see it as one of the core components on why the system has worked so well for retail investors today.

You know, as we all know and what the SEC data has described is that we've seen unprecedented growth in volume, scale, and surging retail participation. And that doesn't happen in a market that's failing retail investors. That happens in a market that's working exceptionally, you know, well for them.

You know, today retail is trading in markets that are often only one or two pennies wide and often receive executions, you know, inside of that. If you contrast that with sort of the distant past, those numbers were measured in dollars not pennies. And I think that's a pretty incredible story.

And I also want to mention there seems to be an uninformed view circulating that all retail flow is very lucrative and desirable to trade against. And, while certainly some flow has a higher expected value than others, the wholesalers who are succeeding the most today have made a substantial commitment to trade against, you know, all flow in all symbols, you know, every day. Good markets, bad markets, fast markets, slow markets. They don't get to selectively choose. And that's no small task for these firms to undertake.

And further, the retail brokers today they're highly sophisticated with robust best execution procedures. And they hold these market makers vigorously accountable to produce, you know, good outcomes.

So I'm just going to shift a bit here, in the sake of time, and building on a lot of the strong outcomes that have already been outlined here today, I

think the important question for this discussion is actually what underpins that success and what risks disrupting it.

You know, the performance we've seen in the options market over the past decade is not just a function of PFOF in isolation. It's the result of a tightly integrated, highly competitive, quote-driven structure where market makers are required to continuously display prices and compete on exchange.

One of the subtopics here was the TRF. You know, and I think it's really important to mention that a move towards a TRF model in options I think would fundamentally change, you know, those incentives. Right? If retail order flow could be internalized off exchange, you would create a two-tiered system, one where all the retail flow would go off exchange and all the institutional flow would trade on exchange. And the inevitable result of that would be much wider spreads, much less liquidity, and price discovery would weaken substantially if something like that were to occur.

You know, the success that we've had is a byproduct of a highly competitive ecosystem. You know, Crutchfield sort of alluded to in the last panel how it's kind of a delicate balance. And I think what the option industry has done so incredibly well is really

strike that balance. And that's why we're -- what we're, you know, here celebrating, you know, today.

So I don't believe that the benefits exist, you know, independently. They rely on the rigorous, visible competition. And if we change the foundation of that, I think we have the potential to, you know, fundamentally change the success that we've had.

And let me just say one more thing really quick as another sort of subtopic. I just want to touch on the DASH ATS that was mentioned sort of in the -- so the DASH ATS is an options-specific ATS. It operates very differently than an equity ATS because we have no resting orders like a typical equity ATS does. And how the DASH ATS works is very simple. We send out a request -- when we send an order into it, we send out a request for response to a pool of liquidity providers who return a market back to us. And, you know, if we get a response that matches, meaning that we get a marketable bid or offer that is at or better than the NBBO, we have a paired trade. We are then able to take that trade down to the exchange, you know, and cross it.

So three things happen. Three potentially good things can happen when an order goes through our ATS. We could find price improvement, we could find additional liquidity than what's available onscreen, and

we could mitigate some exchange fees. And then when we do take that cross to the exchange to cross, there is a second moment for price improvement.

So it works really well. It's been very effective. I think it sort of answers the question that was brought up in the last panel of, hey, you've asked these market makers to quote on 1.2 million plus symbols. It's hard to say that every quote at every second is going to be their best quote. It's not. It is a lot of the time. It isn't all of the time. Our mechanism tries to solve that, where we give market makers a chance to, you know, firm up and provide a better price.

And just some quick stats on that, in 2025, we matched 86 million contracts in our ATS and we received $266 million in price improvement versus the far side of the market. So I'll stop there.

MR. JUZENAS: All right, thanks. And thanks for the discussion on that panel, everybody.

So moving on to the next topic in the customer experience. Zero day options, which refers to the ability to buy -- an investor to buy an option on the last day before it expires with lower time premiums. This is nothing new, because obviously all options have to trade prior to the last day of exposure. But what is new is that there's more series that expire on more days of the week, as has been previously noted, not just the standard third Fridays of the month. And this creates more opportunities for zero dated options.

So what are the panel's experiences with zero day trading and does this trading raise any issues.

Ed, we're going to start with.

MR. HOSTY: So I think that the shift towards short-dated contracts, specifically trading on day of expiry and the immediate time frame before that, has been fairly natural from our perspective. Customers have really, really, really engaged with this product. The find it to be a meaningful way for them to manage their portfolios and manage their risks. They've just naturally gravitated toward it. As a result, there are exchanges or market participants that are putting more of these products in front of people because of what they see as natural usage.

Customers are engaging with this in ways that they don't necessarily engage with historically what we thought about trading, like longer term buy rights on single stocks. These are customers that have, you know, either exposure that they want to manage in a short-term time frame, especially in a news cycle in which day over day you have dramatic swings in things like the market,

the total markets are going to move in ways that volatility has been that elevated. Our customers are trading these differently than they are single stocks. They are trading these in ETPs and indices in ways that are different, that demonstrate that they do understand the way in which they are participating.

You see some participation again in some of the single stocks. But again, those are ones that actually have like news and market-moving events on a daily basis.

AI has caused volatility in a handful of stocks for years at this point, or at least a full year. Customers are engaging there. They are engaging in ways that they are trying to manage their own risk or capitalize on what they see as an inefficiency.

I think that's what we are seeing, is that these are -- these are customers that are skewing younger. These are customers that are naturally more inclined to take risk in the market. They recognize they are earlier in their earnings potential. They are engaging in ways that are possibly slightly riskier, but more so are aligned with what they are trying to accomplish.

I think that's -- the concentration, again, is another signal that they are probably engaging in the

right ways. They are not trading zero DTE on things that are not going to be moving and things that are not -- you know, not necessarily suited towards this.

We've been offering these since they've come up. And again, since the beginning of time. Now you just get more strikes or you get more dates. So I think that's -- we have experience and systems in place to support some of this process. We recognize that there are operational concerns here. There are asymmetric risks that is more by retail, and we think this might be an opportunity to address some of that, and also ensure that all market participants including some of our market infrastructure participants are best equipped to manage this on a go forward. And we recognize that some of these things -- a corollary would be moving to a 24/5 market for equities, which Robinhood trades today.

We're settling in a world where the majority of participants will be participating 23/5 because of probably limitations in some of our market infrastructure. We want to make sure that in options we don't run into those same barriers, and that we can address these as quick as we quick as we possibly can and be ready for when customers continue to engage here.

It is just something that is a natural use case that they're trying to accomplish.

MR. JUZENAS: All right, thank you, Ed. And now Nate.

MR. POMEROY: Thanks. So I think in general, folks in the industry have talked about zero DTE has existed forever. WEX commented when the Monday and Wednesday expirations were first listed that one of our concerns was with respect to obviously some things like corporate actions and events affecting the trading of those symbols on those days, which obviously in its current form, is kind of they avoid the corporate action days when they list these expirations.

But as a matter of fact, like the number of events that affect a particular single stock equity option name are numerous. And as we kind of harmonize or unify those additional expirations with potentially trading in extended hours after market close and pre-open, we do have to recognize, although market making firms will be highly effective in managing all of that cost and complexity, there will be a cost to it. There's going to be a lot of detail-oriented work required to be able to support managing risk around those events.

It's also going to require, obviously, increased staffing. And at some point considerations regarding things like what exactly we're going to think

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about assignment windows or exercise when and as options move towards overnight trading. So there are significant risks that we do need to be thinking about, and I think everyone in this room probably thinks of it as a matter of when and not if.

But we -- I think one kind of more -- it seems likely to me that in pre-open, post-close, single-name trading, out of the gate there's going to be significantly less liquidity. It's going to be highly -- market makers are going to be at risk for a lot in those sessions, especially when there's news hitting the wire that has generally -- is generically related to AI or generically related to any of these hot button issues.

At the very least, with respect to corporations themselves, I would think that it might be beneficial at some point for like the listings company -- like the listings exchanges to more harmonize the way in which at least corporate information is delivered to the -- to the -- like the liquidity provider and the trading community. Because it's pretty open. It's post-close. It's -- sometimes the time at which this information is released to the Street is not unified.

And so those are things that we want to encourage, you know, supporting trading listed, you

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know, SEC-regulated products as opposed to more risky, sort of off-exchange alternatives. But at the same time, we do recognize that there will be significant barriers to liquidity provision and continuing -- continuing to manage that and protect our customers is really crucial.

MR. JUZENAS: Thanks, Nate.

Chris.

MR. SCHWARZ: So, you know, I think there's been a lot of complaints today. First, consumer choice is good. That's consistent with my other comment. But I think there's been a lot of complaints today about the number of quotes and quoting complexity, and all these other things. So as we add more and more products, the question becomes what happens to the quote quality on other strikes and expirations for the same company. And then of course what happens across the market.

I'm keeping my reply short because I know we're behind and I want you guys to get a good raise.

But the other thing I will just mention is zero DTE options, these options create a lot more churn on retail accounts. Right?

You know, I can go on my app right now. I've got nine brokers to choose from. I can buy a zero DTE option right now and within the next three hours and 24

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minutes, I have to do one of two things. Right? Either one, I'm going to lose all of my money or, two, I have to do another transaction where I'm going to have even more transactions cost, right, because I have to do a sell. It's not like an equity where I can hold it forever. And so, you know, I think that's one part of it that's unappreciated.

Now, I'm discounting people who take delivery outside of say Roaring Kitty. I don't think many retail traders are doing that. Sorry, we're on the bird theme. I went with a kitty for the animal.

And these issues of I'm going to call them like contracts per dollar you can trade in an account are only going to get worse. Two days ago, you know, the pattern day trading restriction was removed, so we're going to have a lot of cash accounts that were set up as non-margin accounts to make sure they could trade a lot. Those can now convert to margin accounts and trade twice as much as they could before. So I think the proliferation of these very short duration, low premium cost products which allows retail traders to trade more contracts just amplifies my prior comments about disclosure requirements.

MR. JUZENAS: All right. Thank you all for your thoughts on that panel.

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So the last topic that we've got, and in the interests of time, you know, we'll have to do this maybe lightning round style. So it is enhancement and emerging issues.

So what are the emerging issues in the retail and institutional customer space that you're watching? Is there anything missing and so forth?

But in the interests of time, let's just go through the folks we have. And please keep it brief, but tell us where you think the enhancement or the emerging issues could be?

And we'll start with Racquel.

MS. RUSSELL: Thank you. I'll just quickly mention two things. I think account fraud is something that firms are fighting really hard in options. Certain options strategies are particularly attractive, like zero DTE is particularly attractive. We have been building out additional resources to support members in their efforts to catch this stuff. We have a fusion center. We have a potential intrusions report card.

So, you know, there's new account fraud, there's account takeover fraud. And that's a constant sort of effort of vigilance.

And I had been also thinking about mentioning, but Nate covered it pretty well, but just to tie in the investor education piece with extended hours trading, the compressed time frame that will impact opportunities and value. And including assignments during the overnight period of time and making sure that that is as successful for investors that may choose to trade overnight as it could be.

MR. JUZENAS: Thanks, Racquel.

Stino.

MR. MILITO: Okay. So again, I'd just like to thank the SEC for organizing this roundtable. I do think it's really valuable to bring the industry together like this, and I hope we continue these discussions, you know, going forward more frequently.

So two issues I want to shed some light on. The first is the current SRO model for exchanges. Today we have 18 exchanges, with more on the way. And while I support that from a competition perspective, from a regulatory standpoint we effectively have 20 regulators, when you include FINRA and the SEC. That creates duplication, inconsistent rule interpretations, and at times conflicting obligation. It is not an efficient system.

I could theoretically receive 20 inquiries from 20 different regulators on a single order that I send. It's possible.

That leads to a more fundamental question. Should for-profit exchanges, many of them multibillion dollar public companies, continue to act as SROs? At a minimum, it raises concerns about conflicts or the perception of conflicts, when commercial entities are also responsible for regulating marketwide conduct and decisions to access their competitors.

Okay, second, you know, we're seeing increasing concentration, you know, in the clearance space. So there's only two major clearing firms today, and they're executing about 65 percent of the market. And capacity is becoming a real constraint that is affecting our industry.

The technology does exist to manage risk more efficiently, and that is something we as an industry, you know, need to address to sustain the growth. We've seen an -- remain low. We need to take a first principles approach to risk and margining, or it absolutely will become a bottleneck for the future growth of this industry.

MR. JUZENAS: Thanks, Stino.

Nate.

MR. POMEROY: So first, I would like to plus one everything Stino just said about concerns about regulatory overreach, and particularly with respect to

cross-exchange surveillance and some recent guidance that we'd seen. There's been a lot of concern regarding all that, so thank you for saying that.

The other one I wanted to highlight, or other area of concern, is there has been increasing sophistication in some subsets of activity, especially in the retail order flow space, what we'll call pro-tail. We estimate and kind of across the entire retail broker-dealer space that as many as 10 percent of orders on a daily basis could consist in this subset. And they tend to basically -- they are very sophisticated traders where, if you looked broadly speaking across introducing broker-dealers, and at times even within the same broker-dealer, they are vastly in excess of the professional customer designation.

We appreciate Nasdaq's recent filings to shorten the duration of that. But we don't view that as a final review of that matter.

There are a significant number -- a small number of professionals who are essentially capturing price improvement dollars from true retail customers right now that are commingled with those customers. And we would like to see more in the industry to segment those actors out.

MR. JUZENAS: Thanks, Nate.

JJ.

MR. JJ KINAHAN: Yeah, a couple of things. First of all, I think you guys get an exceeds expectations on your rating. I hope that was noted.

All right. Thanks, Jamie.

With that said, I think there's a few things. So first of all, where we started about being thoughtful about things going forward, someone in the last panel said we got here not by necessarily purpose but by things that happened, and so we ended up in this space. So as we consider a lot of the things that were talked about today, you know, we covered many topics, be it payment forward or flow or how orders are routed, whatever it may be, I ask that the SEC consider how you are the ones who've helped form this going forward, so it's not this is how we got there.

As a particular issue, I would say that, you know, anything with more clarity around prediction markets, et cetera, how those are done, because obviously the other regulatory agency is doing a lot there. And I think in terms of things that truly are securities, they should be on the securities side of the ledger. And so again, as we think about, you know, going back to where I started, we're going to come up on 24/7, we're going to come up on tokenization. So really, let's try and make sure that we don't come back in 10 years and say, well, we just kind of ended up here.

MR. JUZENAS: Thanks.

Geralyn.

MS. ENDO: I have two things also that have been touched upon a little bit, 24/7 or expanded hours. We know that our customers have access to other markets that are available 24/7. We also know that there's global demand for participation in our markets. So it makes sense that the options markets move towards expanding hours.

Having said that, though, we should focus on creating a solution that is harmonized across the board and considers long-term implications like JJ just said, and makes sense for the entire marketplace.

I will skip over to strike listings that also have been touched on. The OLPP, the Options Listing Procedure Plan was recently approved. Thank you, Cboe, for moving that forward. We are looking forward to working with members of the plan to come up with a solution for strike listing sand delisting process.

What will that mean for customers? That will mean in the end better execution quality, a better overall experience for them, and it will also alleviate

some of the pressure on the ecosystem infrastructure. Think about capacity improvement that we've talked about a little bit. And in the end, that will of course ultimately benefit customers as well.

MR. JUZENAS: Thank you. And the changes to OLPP, I think, are very positive. And thanks to everybody on our Staff.

And for the folks who aren't familiar with that, these were changes to the OLPP plan that will allow discussion of things like the strike prices that can be a little difficult, just because you have a lot of competitive entities.

So last and certainly not least, Stephen.

MR. SIKES: Outstanding. Thank you all again for your deft moderation of this panel.

I have two things. One, the first, I would love to build on Racquel's point about fraud. We have seen organized crime out of Mainland China that are using our illiquid options as the way to profit from taking over real Americans' individual brokerage and retirement accounts. And the exit -- their profiting comes and flows directly through a U.S.-registered BD that serves clients in Hong Kong, Mainland China, and Singapore. And there are a few of them. And the idea that this is still going on is something we should all

care deeply about because there is a U.S.-registered BD that sits on one end and is helping these scammers and fraudsters profit through these scams.

And, you know, we've flagged it many times to people at DOJ, FINRA, and the SEC. And it still sits at a place that a year on, we're still continuing to see these attacks. And it feels like something we should be able to mass law enforcement to prevent.

So Racquel is a hundred percent right, it does come back to strikes. And there are things we can do in the options market structure. But there are also things where there is a U.S. BD on the other end that should not be facilitating these transactions and should be able to detect and prevent them before those funds leave the U.S. ecosystem. So one, that was one.

Two, zero DTE, the primary issue we're seeing with retail clients in zero DTE, and it's going to grow, to Chris's exact point, with pattern day trader rule going away in the next, you know, two months, are retail investors who are carrying out-of-the-money positions into the close that they could not support an exercise or assignment in. So what we end up doing as a retail broker is we force close all of those positions. The reason we do that is because there's a gap between when those options are no longer tradable and when the

assignment and exercise decisions happen. And that hour and a half, you know, hour and 15, hour and half gap happens to exist in the most volatile time in our markets. Right? It's when all corporate news comes out. And that means we have to have incredibly wide bands of forced liquidation, forced closeouts at the end of the day. And the dead weight loss there for retail investors is huge. It's, I would estimate, somewhere between 10 and 20 cents per contract opened by retail investor in the U.S. because of those forced moves. And it's only going to grow with PDT.

So we have to figure out how to condense the difference in time or the disparity in time between when we can trade these options and when the options exercise and assignment decisions are made, you know, condense that as much as possible to the least volatile period we can. I'm not an expert, don't work at OCC. But there has to be a better way than having it be in the most volatile hour and half period of every trading day.

MR. KROEPER: Great. Thanks, Stephen.

And thanks to all the panelists for such a lively and instructive panel.

A reminder that written submissions on these topics or listed options markets structure generally may be submitted to Comment File Number 4-887. Search

Options Roundtable on the SEC.gov website for more information. And we really do appreciate your comments.

We will now break for lunch. Please be back here and seated promptly at -- before 1:45, when we are going to hear remarks from Chairman Atkins.

So thanks again to the panel. I really appreciate all your efforts. And it's not the landing at the destination on time, but it's the content of the journey. So thank you very much.

(Applause.)

(Whereupon, at 12:49 p.m., a lunch recess was taken.)

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

MR. SELWAY: Well, welcome back to our final session. I hope everyone had a good lunch. We're going to kick off with remarks from Chairman Atkins.

Mr. Chairman.

REMARKS FROM SEC CHAIRMAN PAUL S. ATKINS

CHAIRMAN ATKINS: Well, thank you, Jamie. And good afternoon ladies and gentlemen, and welcome back after a productive morning.

So in just a few moments, Jamie is going to head up the third and final panel of the day. But first, I want to acknowledge the Division of Trading and Markets for organizing today's program and thank our

more than two dozen panelists for bringing such insightful perspectives to it.

Of course, before I move on to my remarks, I have to add the customary disclaimer to make our own compliance people happy that the views I express here today are my own as Chairman and not necessarily those of SEC as an institution or of the other Commissioners.

As our panelists underscored this morning, the U.S. options markets have grown remarkably in their breadth and depth over the past decades. Today, there are more exchanges trading more products, generating a dizzying amount of message traffic. So, for example, OPRA disseminates over 3,200 times more messages today than it did back in the year 2000. And a broad cohort of retail investors now participates in these markets with greater ease and at greater scale.

Given all that they share in common, it's tempting to discuss the options and equities markets in tandem. After all, the two are deeply interconnected and developments in one market can have profound implications for the other. But commonalities between the options and equities markets can also obscure important distinctions among them.

As options markets operate according to their own conventions, so they merit attention on their own

terms. Yet a sustained focus on listed options has eluded the Commission for some time. And thanks in large part to Commissioner Hester Peirce, I am pleased with today's program we're bringing that stretch to a close.

Now I should note that this roundtable is neither a prelude to nor a harbinger of any options rulemakings in the immediate term. Rather, today is a chance to celebrate the strengths of our options markets and to recognize the important place that they have cm to occupy in the broader financial ecosystem. Today's panel discussions also offer an opportunity for leading experts and practitioners to examine what's working, to identify where closer attention is warranted, and to consider opportunities and challenges that lie ahead.

In that spirit, I should also like to acknowledge the important work that's taking place beyond the Commission's walls. Through the Listed Options Market Structure Working Group, or LOMSWG -- I'm not sure why it's not LOMSWIG, SWAG, or SWUG -- but LOMSWG, as I understand its members have cm to call it, SIFMA and the Securities Traders Association convene market participants with sometimes divergent perspectives to discuss issues of mutual interest.

That kind of industry-led engagement can be

enormously constructive by helping to develop, socialize, and refine proposals before they make their way to the Commission for formal consideration.

So taken together, today efforts like today's roundtable and the ongoing work of groups like LOMSWG strengthen our options market structure in ways that will keep it the envy of the financial world as it gains both volume and scale in the future.

Which brings us at last to our closing session. And I am delighted to turn things over to Jamie for a discussion on the growth of listed options, the associated challenges and opportunities that that growth presents, and the issues that the Commission and market participants should consider in the years ahead. So I expect this to be a thoughtful and wide-ranging discussion, and I thank you all once again for being here and watching online as well. Please enjoy the remainder of today's program and thank you all very much.

(Applause.)

MR. SELWAY: Thank you so much, Mr. Chairman.

We will now hear from the final panel of the roundtable. In this panel, we will examine the growth of listed options, the associated challenges and opportunities that growth presents, and the issues that the Commission and the market participants should consider in the years ahead.

I am joined as a fellow moderator with our associate director, Richard Holley, the ORF slayer.

(Laughter.)

PANEL THREE

OPPORTUNITIES AND CHALLENGES OF GROWTH

MR. SELWAY: And we'll begin brief introductions, brief self-introductions from each of our panelists, name, role, and your interest in the options markets.

Andrej.

MR. BOLKOVIC: Good afternoon and thank you. And thank you to the Commission for including the Options Clearing Corporation in this discussion. My name is Andrej Bolkovic. I am the CEO of the OCC.

OCC, as probably many of you know, is the central counterparty to every listed options transaction and we sit at the center of this market. We are deeply invested in its stability and its health and its overall growth. And, you know, to the points made earlier, the growth has been remarkable.

If we recall, the last time this roundtable was held was 2004, and at that time the Options Clearing Corporation cleared just over one billion contracts, to

having cleared over 15 billion contracts in 2025.

So that also shows us that the growth is a sign of a healthy and robust market. And it also places obligations on all of us, exchanges, clearinghouses, market participants to ensure that the infrastructure, the rules, and our culture are keeping this market save, can scale alongside it.

Thank you.

MR. BROWN: I'm Shelly Brown, executive vice president, chief strategy officer at MIAX, also chief executive officer at MIAX Futures. I'm honored to be here today with all of you. I think meetings like this among our peers are what moves the options industry forward.

I would like to thank the Commission for inviting me to participate, as well as all of the organizers for putting this program together. I would also like to personally thank Jamie and Richard at the SEC, in particular, for the invitation to be on the panel, and for your leadership on the Trading and Markets team.

Today's panels have been incredibly informative and have really reinforced the breadth of knowledge that is typical of senior leadership across our industry.

I have spent the last 15 years helping to build MIAX family of exchanges. And prior to that, I have held a number of senior positions across the industry, including roles at Peak6, Nasdaq, PHLX, Susquehanna, and many years as a floor market maker on Cboe. I have seen a lot of change in the industry over my 45-year career, especially since my first role as a runner on Cboe.

Clearly, we have come a long way since the first few exchanges were founded. And today's markets are radically different but in a very good way. I believe the industry has done a tremendous job of building out the infrastructure to support modern markets. The entire industry should be congratulated for its efforts to build out a market that is the envy of the world, with deep investor participation and a resilient market structure. And I believe today will provide a strong foundation for future growth.

MS. CRIGHTON: I appreciate the opportunity to be here. And huge thanks to the Commission for the focus on options markets. My name is Alicia Crighton. I work at Goldman Sachs. Amongst a number of roles and businesses that I'm a part of, I head our global options clearing business, and that is the perspective that I'm hoping to share today.

As has been discussed many times throughout the day today, the growth in the options markets over the last few years in particular has been nothing short of extraordinary. And there is no better time to discuss how we can continue to maintain that momentum and ensure that the markets are future proofed.

So how do we continue to grow and ensure that the ecosystem is serving the needs of all who participate? My focus today will be twofold, really. One is to bring the institutional investor perspective, and two is encourage us to think about execution and clearing more holistically. Both are equal -- in equal parts fundamental to ensuring that we're paving the way for further growth, as well as ensuring stability and resilience.

We think some market structure reform will provide the right incentives for competition, execution quality, and most importantly risk management, and maintain the U.S. options markets as the preeminent market, as they are today.

Thanks, and I look forward to the discussion.

MS. GREENE: Good afternoon and thank you for having me. And thank you to Chair Atkins for recognizing the work that LOMSWG has been able to contribute to and achieve over recent years.

My name is Ellen Greene and I am with IMC, a global trading firm and market maker. We were founded in 1989 on the floor of the Amsterdam Options Exchange, and have always combined trading expertise and technology, an approach that continues to define how we operate in today's electronic markets.

We provide liquidity across equities, ETFs, and derivatives on more than 90 exchanges globally, and are an active participant in the U.S. options market, including both single names and index products like SPX.

Options markets are fundamentally quote driven. Market makers compete and continuously manage risk and quote across a wide range of strikes and venues, and that competitive quoting is what supports liquidity and investor participation. From that vantage point, we think carefully about how market structure impacts both quality and growth, as well as the overall customer experience.

The listed options market has evolved rapidly in recent years, driven by innovation and increased participation across both retail and institutional investors. As we've heard today, the market continues to evolve. And the question is how to ensure regulation keeps pace while continuing to support this competitive environment that we're in with liquidity and resiliency.

MR. KENNEDY: Well, thank you, Jamie, and thank you, Richard. And I do want to thank the Commission for convening us today. And I also want to thank Chair Atkins, Commissioners Peirce and Uyeda for their continued engagement and leadership on options market structure.

For those who I haven't met, I am Kevin Kennedy, executive vice president and head of North American Market Services at Nasdaq. And I have spent 39 years in the markets, including my first 20 as a market maker and a specialist providing liquidity. And I have also had the opportunity to serve in industry governance roles, including currently on Andrej's OCC board, as well as the Canadian Investment Regulation Organization, CIRO.

Over more than five decades, the U.S. listed options market has evolved into one of the most resilient and competitive market structures anywhere in the world. That success has been driven by deliberate design choices, trading on -- on regulated exchanges, mandatory -- mandatory order exposure for competition, centralized liquidity, and a strong clearing framework. Those fundamentals have produced deep liquidity, tight spreads, and a strong price discovery that benefits investors of all sizes.

I am so proud of Nasdaq's role in this ecosystem. But I am equally proud of the industry as a whole. You know, as I look up and down my fellow panelists, to me and the two panels before, it really is like a dream team. You know, I like to put everything in sports or just different competitive terms. And we have like a fantasy team that is incredible in this industry. And I think it is the collective whole that has made us where we are today.

So competition among exchanges and market makers continues to power liquidity while innovation in products and access has expanded participation. As the market continues to evolve, future growth -- why we are here today -- will depend on maintaining strong, industrial-grade guard rails, preserving transparency, resilience, and most importantly investor protection so growth reinforces confidence rather than undermining it. The opportunity ahead is not just continued growth, but sustained, high-quality growth, built on this strong foundation.

I appreciate the Commission's stewardship of this market and look forward to a constructive discussion on how we support the next phase of the options market together. And before I use the term "envy of the world," I really want to just say that the

strength of U.S. markets is something we should all be proud of, but it's not something to take for granted.

Sustaining this position means doing the work, the work that we're doing that starts today, and obviously it's been going on for decades to get us here. But we want to do it thoughtfully, deliberately, and with investors firmly at the center.

And with that, I'll pass it to Matt.

MR. MacKENZIE: Thanks. Hi. I'm Matt MacKenzie. I look after U.S. policy for Optiver. Optiver is a global market making firm started by three options traders in Amsterdam 40 years ago this year. We are celebrating our fortieth anniversary this year. We provide liquidity around the globe and we do it through a combination of human capital and technology, much like Ellen described at IMC.

One of the core values of the firm is that we improve the market. And that has multiple dimensions. It means we improve the price and quality, but we also take very seriously the responsibility to think deeply about market structure issues and offer our thoughts about ways to improve the market through a policy lens. So that's why I'm so excited to be here and to have been invited to participate. So thinking back two years to a conversation with Commissioner Peirce when she asked if it would make sense to do a roundtable like this, it's, you know, it's a real pleasure to be here and we're excited to continue the conversation. So thanks, Jamie. Thanks, Richard, for holding this.

MR. MATALKA: Thank you. Hi. I'm Faris Matalka from Charles Schwab. I run trading operations. We oversee about 47 million customer accounts across our retail, self-directed, and RIA businesses. We are seeing firsthand a dramatic increase in options, as noted today. Trading from our existing clients, but also a substantial increase from new clients. As Commissioner Peirce said, the pie is growing. We are seeing a lot of entrants in the market. Also, our younger investors are adopting and utilizing options at a really high rate.

Our approach to clients trading options has always been about a focus on client education. And as JJ said, it's free education, whether you're advanced or a beginner. We customize education to your needs. We provide a best in class trading platform with features that help clients manage their own risk and also parlay that with an interactive client service model that is staffed with options specialists so they can help clients, answer any clients' questions.

So as mentioned, this is really an exciting

time in options trading and really a timely roundtable discussion. I thank you for the opportunity and look forward for our discussion.

MR. MURAVYEV: Well, thank you for the opportunity. I will be brief. My name is Dmitriy Muravyev. I am an associate professor of finance and the Hewlett Research Fellow at the University of Illinois Urbana-Champaign. I wrote many papers about option microstructure, including studying option trading costs, option market makers, and retail trading, and I am happy to provide the academic perspective on those issues.

MR. TOES: Hi, I'm Jim Toes. I am president and CEO of the Security Traders Association, also known as STA. I want to thank Jamie, Richard -- excuse me, Director Selway, Richard, and the Commission for organizing this roundtable.

You know, roundtables and House hearings play such a vital role in the rulemaking process. You know, it's an opportunity, obviously, for the presenters to kind of get very tight and organized on their thoughts and on their opinions, which provides a lot of the value for the industry for them to play off of.

The STA is -- our members are individuals who are employed in financial services. They are not firms.

Our members are individuals. We have 16 affiliates in the U.S. and four up in Canada. It is a diverse group, both by geography and also by the roles that they play in the marketplace. We do maintain a listed options committee at STA. Very proud to say that of the 23 firms that are represented on this panel, 21 are also members of that committee. The other two will be getting sponsorship packages tomorrow morning.

(Laughter.)

MR. TOES: The perspective, just to play off some of the previous remarks here, the perspective I think that I'm trying to bring here is prior to STA, I was on the equity side, 20 years at, you know, Merrill Lynch. And I can't impress upon everyone enough that like this is a different market structure. You know, this is like if you're learning a new language and someone asks you a question in French, the first thing you're going to do is you're going to translate it in your head to what the question was in English, think of your answer in English, and then try to respond in French. Forget it. You have to just really appreciate the fact that this is a different market structure, and it deserves its own, you know, view from that perspective.

And the last thing I'll say, too, is I just

want to say thank you to all the people on the LOC committee because they've been very patient with me for the past 10 years on taking an equity guy in and teaching him about how the options market structure works. It's a really cool ecosystem. I don't -- my years in equities, I never saw market makers exchange as clearing firms, vendors, clients, all in a room trying to make the marketplace better. We are all guardians of this marketplace, and I think that the folks in listed options really exemplify that.

MR. TREACY: Thank you to the Commission and to Jamie and Richard for the opportunity to participate today. It's a privilege to be a part of this conversation. I was hoping you guys would add a fourth panel about shoe companies transitioning to AI companies, but we'll save that for another day.

I'm Mike Treacy. I am the vice president of risk at Apex Fintech Solutions. We are one of the largest independent clearing firms serving retail investors. We cleared over a billion in options contracts in 2025 across 220 correspondent broker-dealers. So when we talk about options market structure, we're talking about the plumbing that our clients and customers depend on every day.

My focus in the options space is what I see as the defining operational challenge of this era, the secular shift from start-of-day/end-of-day risk analysis to a world that demands continuous, 24/7 risk monitoring spliced into smaller intervals.

I look forward to discussing these topics with you guys. And my background is as a volatility arbitrage trader, so I come from a unique perspective, risk taking to now managing a lot of the trades I used to expose in the market.

MR. HOLLEY: Thank you. We'll begin our panel with our first question focused on the challenges of growth.

As we heard this morning, we now have more than 20 registered options exchange, 18 currently operating, and are well over one million series. Efforts at strike mitigation and harmonization are counterbalanced by expansions in short-term options and new options.

Market participants have done an admirable job of keeping up with the enormous growth of options. So reflecting on this remarkable growth trajectory, what options market structure concern keeps you up at night?

Let's start with Kevin.

MR. KENNEDY: Thank you, Richard. You know, I love to say when I'm in front of other panels or even at

work internally, like nothing keeps me up at night because we have such a great team, et cetera. But honestly, there are two things that really do keep me up at night. Because I live, sleep, drink, eat options, just like JJ and so many other people in this room. And systemic risk bothers me. I've seen it go bad in the past with us. As good as we are, we've had issues. And with all the extra interdependence that we now have, and with more exchanges and with more quotes, I'm concerned we're not paying enough attention to it.

So when I answer some of these questions today, I want to focus on three things. I want to focus on like reflecting on how we got here and highlight maybe come concerns and then offer constructive criticism or maybe a way to execute.

So for this one in particular with what keeps me up at night, I don't have the solution with respect to resiliency. I mean, we've been resilient. But it's coming. Right? Whether it's -- how it comes, we won't know. But we're becoming more and more interdependent every day, with zero DTE, I mean, everything. We all know.

So I'd say I want to highlight that for the Commission and figure out collectively how we can improve there and make sure that when something does

happen, we all understand what the other exchanges are doing, what phone call we're going to get on, what happens at 3:00, what happens at if this happens at 11:00 a.m. So I would love to see some highlight of governance there.

So then I want to just jump in, because you may not come back to me, I do want to add two or three other things. One is which those things keep me up at night. However, as I've said in my opening statement, this is an incredible product that we have. And it's really a treasure. But there's always room for improvement.

And I would say two things we could probably all three panels and almost everybody in the room, and I think even you and your Staff could execute on is the penny pilot -- the penny program, I guess we call it now. As we see that we're not trading 8,000 securities, I think there's room to do more. We're hearing from clients that we'd love to see -- step on the gas a little bit on getting things into the penny program. So I think that would be something we could all execute pretty quickly.

And then the other thing we hear, and I know Cboe has done exceptional work already on this. But the position limits, like they're clunky. And even when we

finally get them approved, I think we still need every single exchange to file in order to affect them.

So the two things that I would like to highlight that I think we could execute on pretty easily would be let's take a hard look at the penny program, and let's take a hard look at position limits. And maybe just, again, with my sports analogies, but I like to move the chains. Let's just keep moving down field. So I don't want to take up too much time.

MR. HOLLEY: Thanks, Kevin.

Alicia.

MS. CRIGHTON: Great, thank you. I'm going to take the question in two ways, probably a little bit different to Kevin. I actually do have a long list of things I worry about at night.

The kind of couple of places I'll focus on here, I'll start with execution and then I'll make sure we cover clearing as well. I think, you know, one of the things that we worry about is how do we ensure that we're servicing our institutional client base. And focusing on what are their needs and what are they coming for us to do and what are the ways that we can service them.

And we think one of the most significant impediments to being able to service that part of the ecosystem is the current structure around the 60/40 rules. And that, I'm sure everyone in the room knows, but it mandates that when an order goes to the floor, market makers are guaranteed 60 percent of that, and a last look by simply matching on price, which means they're not price improving.

And when we think about our role and what we're doing, we're providing a number of services, trade ideas, research, risk management, we're intermediating, we're providing capital on many of these trades. And so we think by allowing that 60 percent to automatically trade away, it disincentivizes us from providing what we think is much needed liquidity to the investor community or institutional investor community.

This rule is over 25 years old. It came out in a very vastly different market environment where liquidity was a problem. We traded fractions of the volume that we trade today. And so we encourage reform to ensure that markets are fit for purpose for the institutional investors.

On the clearing side, clearing capacity is an area that many of us focus on. Options clearing capacity for market makers continues to be a topic of discussion and concern, whether it's for market makers, whether it's for institutions, for the growing ETF

ecosystem. And we think about the resources that we provide as a clearer, they're extraordinary. Right? Whether it's balance sheet, capital, funding, liquidity, that list is extensive, including the technology it takes to support those flows.

As this group knows, our job as a clearer is to stand in and guarantee the performance of the firms that we bring to the ecosystem. So meaning the model is based on one where you capitalize and guarantee the risk that you bring. And so we think that actually the OCC rule filing to reallocate the default fund based on risk is appropriate and we fully support it.

And so while we've innovated a lot on the exchange side, it's important to think about the protections for clearing firms. And I don't think they've kept pace with the risk in the market, and so that's something that we can hopefully focus on later in this panel.

MR. HOLLEY: Thank you.

Ellen.

MS. GREENE: Thank you. As we heard earlier, the options market structure has been very effective in promoting competition across both market makers as well as exchanges. Competition in the exchange space is driven by meaningful differentiation, new models, new

functionality, and real innovation, which is positive for the market.

At the same time, the current structure continues to incentivize exchange entry driven by the linkage plan and the requirement that options be traded on exchange and cleared through the OCC. And just to pause, the work Richard that the Commission has done on ORF has been many years in the making and just congratulations on getting that across the finish line.

So as we do look at our exchange venue with 18 exchanges, new launches coming, each additional venue increases fragmentation. As we heard in the first panel, there was a lot of focus on what the costs to those market participants, market makers might be. But if we think about it from a different lens, being a market maker requires that we connect to each exchange, process additional market data, maintain quotes against more order books, and allocate more capital more broadly to remain competitive.

We see similar pressures in market data with continued OPRA growth and in clearing, as Alicia just discussed, as capital and activity becomes more distributed. This creates real operational and infrastructure complexity at scale. And those costs are not optional. It further introduces growing compliance

complexity as exchanges take differing approaches to rules and their interpretation, creating ambiguity and requiring firms to navigate nuanced and sometimes inconsistent expectations across venues.

So what keeps me up at night is whether the incremental benefits of additional venues continue to outweigh the very real costs they introduce. The question going forward is how to preserve the benefits of competition while encouraging the kind of innovation that adds real value and ensures the market remains efficient and resilient as complexity continues to grow.

MR. HOLLEY: Thank you, Ellen.

Jim.

MR. TOES: Listen, I know we talked about operational capability. You know, our markets also run on investor confidence. We rely on that. If investors lose confidence in the marketplace, it's never a good outcome.

I think where we're concerned, we've heard some talk about, you know, account takeovers and the proliferation of strikes. I just want to just tell you where we're kind of focused on this. Like, you know, account takeover, first off, this isn't new. Account takeovers, it's not a new phenomenon. They have been occurring for decades. Obviously, with the advancements of AI, they're occurring much more frequently and much more sophisticated.

Account takeovers, it's not just an option specific problem. You know, account takeovers, where the money is being moved from a legitimate account into a fraudster's account, it's occurring in ETFs and also equities.

FINRA is doing an enormous amount of work on this. Racquel touched on it a little bit earlier. But I really would encourage you to, you know, kind of understand the amount of work that they're doing in this area. They've carved out a lot of trust in the industry where there is a lot of information sharing taking place on it.

When you look at the data that is there on account takeovers, as pertains to options, listen, it's occurring in these far out of the money strikes where there is no hope in interest and no activity, you know, that those conditions obviously create the opportunity for a fraudster to interact with the account that they have taken over by directing orders to a particular venue. So it's also worth noting too that this activity is very hard to pick up, because a lot of it is occurring within that wide spread or slightly outside of it, so it's hard to detect it. So really, obviously,

the only way that we can kind of see this improving is really on the prevention side, preventing these, you know, 30 to 50 percent strikes that are -- that have no volume, that have no open interest.

I know the OLPP has with the most recent amendment, there's a form that's been put in place that allows the exchanges to sit down and talk about this more freely than they were allowed to before. We look forward to -- it's a very positive step. We look forward to engaging with that. But this is an area that we're most concerned about.

MR. MATALKA: Could I maybe just add one more point to that? Because we deal with those account takeovers all the time.

I think the strike mitigation helps. I do think there has to be, and you asked about what policies or frameworks that we can add. I think a framework similar to clearly erroneous, where trades can be broken, customer to customer, that is -- you know, in addition to the strike mitigation, that's really crucial to stop this fraud from happening. So just want to -- and that doesn't keep me too much up at night but maybe 2:00 a.m.

MR. HOLLEY: Thank you, Faris.

Shelly.

MR. BROWN: A few things. First off, I agree with Kevin on the systematic risk, something that keeps me up. Obviously, things are a function of testing and efficiency. But something we're always concerned about.

Another one is the strike listings. We talked a lot about that already. I would like to clarify for folks in the room, for folks who aren't aware. We talk about one and a half million listed series. It all depends on how you define a series. Is a series the eight fifty call or the eight fifty line with the call and the put? We have one and a half million options, and we talk about a large percent of those options don't have open interest. You have to keep in mind, the out of the money puts that have open interest, the in the money calls don't. We have to take that into account. At the same time, we need to be able to clear the way the exchanges can work together, without DOJ interference, to talk about listings.

The thing that keeps me up most though is our obvious error rules. I think there, we've done a good job of coordinating with the SEC across all the exchanges having harmonized obvious error rules. But there's a serious lack of flexibility. Everything is predefined on how we act and how we react. The problem is we can't define everything in advance that could

possibly happen. I go back to an 1964 case that was at the Supreme Court and Justice Potter Stewart said about a case that had involved pornography, he said I can't define it, but I know it when I see it. And it's really the same thing that applies to obvious errors. You look back, whether it be a customer account that was stolen and the customer trade needs to be busted, or there's so many different things that can happen. We can't define those in advance. I think we really need to readdress obvious error. The guy that did nothing wrong should not be forced to lose money.

MR. KENNEDY: I just want to give one follow-up quickly. When I talked about systemic risk, I want to be clear. First of all, having 18 exchanges, I think we are in excellent shape as far as handling investors, when MIAX has a problem or Nasdaq has a problem or Cboe has a problem. What I'm looking for to highlight is governance and transparency about what the playbook is, the procedures, when something happens.

So that's what's keeping me up at night. Like we're not communicating and don't have a central sort of repository to understand what the playbook is.

MR. HOLLEY: We'll turn to the next topic, which is going to be market makers and capital.

So as we heard from this morning, how

displaying a continuous quote across so many series and exchanges is not for the faint of heart. We've seen some large firms exit the business recently and some new firms enter.

One challenge market makers face is securing access to capital from an increasingly smaller number of clearing brokers, some of which are owned by bank holding companies that themselves are subject to evolving bank capital rules.

What challenges are market makers and clearing brokers facing today and what can be done to help facilitate solutions to those challenges? And I'll start with Andrej.

MR. BOLKOVIC: Thank you. And I think, you know, a couple of panel members pointed out the clearing capacity is a concern. And having been myself both on the clearing broker's side and on the market making side, there is only a few firms that can actually support market makers, and especially as it relates to index market making. And that has been the case for a while, and it would face concerns in a, you know, catastrophic event, who would be able to absorb any new market entrant or even the entrants that are there today.

We've seen stable clearing membership across

the OCC in terms of absolute numbers. But the capabilities and the capacity to support market makers is fairly limited. Luckily, we are seeing some new market entrants entering the space, which I think is also supported both by the OCC as well as some of the other clearing firms, who do not believe that it's beneficial for the industry to have this consideration.

On the OCC side, we definitely want to make sure that we manage the risk as efficiently as possible. And we do continuously see where we can improve our margin models to make sure that we calculate the risk as appropriately and as efficiently as possible. We do offer different programs to manage some of that risk through escrow deposit program. We are looking to improve our current approach on paying interest on margin. So we are trying to see how we can support the industry.

And being a qualified CCP, we do offer benefits to the banking community in terms of the risk-weighted assets that they have to hold against a central counterparty like the OCC. And we do also believe that, you know, we are working with other CCPs to see where we can make sure that our operations are efficient across the board, that the cross-margin agreements that we have are as appropriate as possible, to make sure that the

industry can continue to develop at a safe and -- pace.

MR. HOLLEY: Alicia.

MS. CRIGHTON: Thanks. I think, you know, if we focus on some of the challenges in being a clearing member and providing clearing capacity in particular to market makers, the two sort of broad buckets that we think about are one is operational risk, and that covers a number of different areas. And the second is bank capital and what are the requirements as a GSIB that we need to hold in order to facilitate that.

And I think directly correlated to the growth of the options market is the demand for clearing capacity. And it's not just in options, it's actually in every product that's cleared, and also in products that are, you know, coming forward in order to be cleared. So treasury and repo.

And we think about what are the operational risks? And I think it's almost been implied in the market that clearing is a utility service. And I think we have to think about that a little bit different on the forward. When you think of the volumes that trade, the pace at which trading is done, you know, I think you said you're averaging 70 million contracts a day. That's one market in the U.S. Granted, it's across a number of different exchanges, but that's one market.

And many of us are clearing across a number of different markets.

So we are, as we stand in and provide that guarantee, it's very difficult for clearing firms to be able to define the capacity that they want to provide. And so we're sort of implying that we would provide unlimited capacity and unlimited guarantees to clear and settle a market maker or any firm's activity that we are signed up to clear for.

So I think starting to think about what are protections for clearing firms, how do you define and size the capacity that you're willing to provide. I don't think the view should be that it's unlimited. And how does the ecosystem come to together? And Shelly, you mentioned like the obvious error rules and the catastrophic obvious error rules, thinking about coordination. What are some additional checks that need to go into the gateway and ensure that we're preventing these types of errors before they happen? What are some things that we can do to coordinate around the industry where there is consistent tooling, maybe portals? You know, there are things that we can do and self-solve for that would reduce some of the catastrophic risk that a clearing firm can face.

And then on the capital side, you know,

clearly the Basel III re-proposal, as we spend time thinking about, you know, what are the implications, there are clearly some benefits that we see in terms of the recognition of netting. Andrej, you mentioned some of the cross-margin programs. I think we were long disadvantaged of cross-margin programs, gave us the ability to recognize risk offset in margin. But we were never able to take those benefits in the capital rule. So having the ability to do that going forward, you know, as we kind of evaluate what's in those rules, we may have more feedback as we continue to dig through them. That is certainly a helpful step forward.

But I think, you know, the amount of liquidity that we provide in order to be able to facilitate the trading on these venues around the globe is significant. And so just thinking about some of the protections and some of the things that we can self-solve as an industry and kind of bringing together the advancements on the execution side along with the clearing side help bring that much-needed capacity here and to other markets where we clear.

MR. HOLLEY: Thank you.

Matt.

MR. MacKENZIE: Thanks. Thanks for the question.

So I think it has been discussed a lot, the challenges that market makers face in terms of the cost and complexity of these markets, from market data to connection fees to everything else. But there are also constraints imposed just by virtue of the need to use the balance sheet of a clearing bank to access a cleared environment. And those -- those sort of externalities come from the bank capital rules themselves.

And this market is moving so quickly that one of the things that Optiver had to do in order to deal with that was apply a fair amount of resources, both human resources and technology, to build our own data visualizations of our clearing partners' risk-weighted assets. And when we're getting close to those constraints, we have to modify our behavior in the market.

So we're not behaving in the market the way the supply and demand signals might suggest. We're doing it in order to maintain the RWA measures that our banking partners have. And I do think, you know, the Basel III reproposal that Alicia just mentioned, it's encouraging. I'm not expert in prudential rules, but most prudential rules, in my experience, were not written with trading firms in mind.

So I think the devil is in the details on

that. And we will see where that is headed.

But it is encouraging that that proposal is out and that it has taken a step away from the original version. And I think pretty hopeful that we could see that rule be finalized in the next year, year and a half. And that may help to alleviate some of the constraints that I had described before, so we can get into the business in a day-to-day way of providing liquidity to these markets.

MR. SELWAY: So before we leave market making, I wanted to ask, you know, the definition or maybe lack thereof of bona fide activity has come up in the equity context. Is there anything in the options world we should be doing with that definition?

MR. MacKENZIE: Well, there is something you are already doing. So I would like to extend thanks to Richard and his team. There's engagement between Trading and Markets and the PTG on the bona fide market maker exemption to Reg SHO.

And one aspect of that that I don't know has been discussed that much is, as we're exploring this new world of a tokenized security, you know, one of the challenges for bona fide market making is the locate requirement for a hard-to-borrow security. If it's tokenized, is it going to be locked up and basically

impossible to borrow? Like that's a ripple effect that maybe needs some further consideration, more time than we have on the panel to discuss. But there are definitely constraints to that hedging aspect of any market maker's business.

MR. SELWAY: Thank you.

MR. HOLLEY: Now we will turn to single stock weekly series.

So some exchanges have proposed expanding the number of short-term options, weekly series, on single stocks. Unlike for index options, that raises unique issues, like assignment after the 4:00 p.m. market close or corporate action or earnings news, including for related stocks.

Is there a balance to be had between offering customers more single stock expirations and the risks and burdens that additional series place on liquidity providers and market infrastructure? And if so, where do you draw that line.

Let's start with Faris.

MR. MATALKA: Yeah, thank you.

I think maybe just taking a step back, and I think to Ellen's point, like the exchange competition today in the environment where, you know, vying for more volume is creating this dynamic of innovative products that we haven't seen in a long time, that's a good thing. Right? But I think as with any new product, we need to move slow and methodical, just assess any potential unintended consequence.

So but specifically to the -- to those Mondays and Wednesdays, you know, these started in late January. We are seeing strong adoption. I think Ed mentioned that. I think we're seeing that, you know, industrywide. I think the PDT, updating and modernizing the PDT rules is going to probably increase that, so the indication is that will grow even more.

The liquidity, to your point, has been robust. We've seen tight bid/ask spreads. I think one thing to note out here is Nasdaq did a great job listening to the industry. Thank you, Kevin, for not listing these on earnings. But I think it was talked about in the second panel there.

But, you know, news comes out in non-earnings cycles all the time. Right? So we've seen that, the chip, you know, China ban and the AI disruption as well. So I think I go back to operational risk and proving that operational risk. Right?

So I think most firms, and retail specifically, and I think Stephen mentioned that, we need to keep the pace, right, with this innovation. And

by that I mean, we need to upscale firms' intraday capabilities and monitoring for expiration and assignment risk. Like, for example, like firms and maybe retail firms may manage throughout the day to maybe a 5 percent move on the options, on Qs or SPOI for the assignment potentially that move after hours. You extrapolate that to single stocks, we could see a 20 percent move.

Some firms maybe have a different approach to force close. Maybe we don't do that, for example. But I think the key is that increase in scope is substantial. That's hardware, that's faster systems, that's potentially more staff, risk staff to monitor. So I think we -- so since these started trading, I think we haven't seen an event to really pressure test these capabilities until we kind of move to adding more names or even more days. So we need to prove that.

So the last point I want to make, look, we've created so much confidence with the retail and the options market over the years, I think all it takes is one adverse event or a headline event that could really erode that trust. So I guess I would say let's move slow to go fast.

MR. HOLLEY: Thank you. Mike.

MR. TREACY: Yeah. So first and foremost,

Apex fully supports expanded expirations. But we are already seeing issues. One of the hallmark conditions by which these companies to list Monday Wednesday was that they do not report earnings on that day. What do we have happen yesterday? Amazon came out and announced earnings for Wednesday.

So one of the key conditions by which this listing was approved has already been broken.

Additionally, I am concerned about broker-dealers in retail who are disadvantaged in the after hours cycle for contra decisionmaking. So many broker-dealers, the cutoff decision is at 5:30 Eastern. But many broker-dealers require their customers to submit their decisions by 5:00 p.m. Now, this gets very tricky with single stocks and with earnings volatility because you often have earnings announcement after the close at 4:00. And then you have conference calls often starting right at 5:00.

And so there are two tremendous catalysts there that can cause stocks to swing back and forth. And my worry is that you're going to have retail traders that put on seemingly low risk debit spreads and they end up forgetting to exercise the long leg of their contract.

I think there are ways to work around this. I

think that if we considered potentially changing that 5:30 cutoff and reduced 90 minutes of after market volatility down to potentially 30 minutes, I think that could be helpful. But I just want to make sure we all, again, let's run before we walk on this. Because I think it would be unwise to roll this out to 50 securities in the next six months and have us trading Monday through Friday.

MR. HOLLEY: Dmitriy.

MR. MURAVYEV: Let me offer a somewhat like independent perspective on this. First of all, I think that an individual stock wait list is a great idea. It's a part of the trend for shorter and shorter options which really fueled the growth of them.

But I think as we shift to shorter and shorter maturities to the trading course and best execution becomes ever more important, right, for two reasons. First of all, the holding periods become shorter and shorter, for example. I find that the retail investors say in those kind of short-term options, they hold position for about one hour. So if you rotate your positions faster and faster, trading costs are important.

And also with shorter maturities, option prices become lower, which is part of the attraction for the retail investors, and as option prices become lower, then the reality of bid/ask spreads are higher. So for example, typical option price will be below a dollar, so a one penny tick size becomes binding.

So if we think about the best execution in the option market, there is really not much public data. So the SEC report today showed that the effective spreads remain relatively stable in the option market, even though in the stock market in the last 20 years, the bid/ask spreads decreased. So this highlights the need for some kind of like a public disclosure. In the stock market, we have the Form 605. In option market, we largely have nothing.

This is especially important for retail investors, right? So for example, a typical retail trade would be around like slightly under a thousand dollars. And if retail investors execute well, they will pay $5 or less on that $1,000 option trade. If they pay the entire effective spread, they will pay $25 or so.

I think it is important to educate investors not only about what a butterfly or iron condor is, which I think the industry did very, very well. But also about the trading costs. What we find in our research is an individual investor, so they make decision whether

to submit market orders or limit orders. And they do a very good job of -- some of them do very good job but some of them don't. So I think it's important to highlight, like educate retail investors about those trading costs and those trading costs become ever more important with shorter maturities.

MR. HOLLEY: Kevin.

MR. KENNEDY: I thought Dmitriy said that well. But then I also think of what Faris and Mike said, and they're in the trenches. Like this is -- they're there.

But now I want to do like the reflection that I talked about earlier. I think the Staff took a very long time to approve us for single stock, and I think that was the right thing to do. And I think we got it right. We're seeing that even with normalizing the volume, that it's accretive. So I think we've had a really good experience so far.

One of the things I like about moving measured and deliberately is that you learn. Right? So we learned something in the last 24 hours. We learned that that can happen. We knew it would happen at some point. And meaning that Amazon might have earnings on a Wednesday that we had expiration. We lived through this the day before Good Friday last year with Netflix. You

know, so we've learned.

I just want to make sure, and I don't want to put words in your mouth. I think -- I believe you're both advocating we can continue to go, just don't open the flood gates. Because I still think there's room for a few more securities. We'll continue to learn. And whether we get the additional securities or whether we move to Tuesday Thursday, we can talk about collaboratively and collectively. And with extra weight. Because, like I said, you guys are in the trenches.

But I don't want us to quote the great Stephen -- let's not let perfect be the enemy of the good. And I think that's what Stephen Sikes was trying to get to.

But I do want to keep moving forward, but with a lot of input.

MR. TREACY: Yeah, I just want to add, I think the worst thing you can do is shut something down the second it breaks. I think there is a fatal flaw in the market sometimes, and regulation where when something bad happens, we react and turn it off. And I would hate to see that happen in these products.

MR. MATALKA: Maybe one point I think, and that ties in to maybe our second topic, but global trading hours expansion, that 15 minutes, I think from a

risk perspective, is going to really help. You know, to your point, about the after-hour move and potentially the assignment risk, so that's going to help tremendously for managing this risk for this product. So I think those two go hand in hand.

MR. KENNEDY: And maybe that's what you were saying. But also I think that OCC window, like we should really talk and think about how we can narrow that.

I understand there's trade adjustments and things like that, especially until we modernize the floors. But -- even better. But I do think there's opportunity to work with OCC.

MS. CRIGHTON: And maybe I'll just add to that. I think that's one of the places where the ecosystem can come together. Because I think there's a variety of perspectives where, you know, continuing to move forward with the listings, the additional expirations, while it moves the market forward, we have to make sure that we have the appropriate guard rails in place. Because ultimately, it's the clearing firms and the OCC that are wearing the risk of these processes as well as the individual investors. And so we need to make sure that we have the right guard rails.

I think exercise and assignment processes are not seamless. They have come a long way. But there is a lot of room for improvement. And so these types of events, I think, highlight the fragility in some of those processes. And so guard rails and actually sitting down and talking through what are we trying to achieve and how do we do that safely with all -- with all parties around the table I think could really go a long way.

MR. BOLKOVIC: I think in terms of things that keep you up at night, I guess with the majority of firms is like, you know, operational risk or production, exercise assignments are the most concerning. They are still complex, which I think to a certain extent also, you know, we'll speak later maybe about, you know, tokenization and those things. That's where I guess the option market differs from the equity markets. And we need to keep that in mind as we -- as we develop further.

MR. BROWN: One thing we didn't talk about, there's ideas about how to mitigate the exercise risk, extend trading hours, move the window into a smaller time frame for exercise. Another way of looking at this that we need to talk about is possible change at Options Clearing Corporation, and how you determine automatic exercise. Should it be done at the 4:00 closing price?

That's really the trigger of this whole problem.

MR. HOLLEY: You've got a growing to-do list. But at the risk of putting you too much on the spot, if something -- changes to the exercise window, is that something that's feasible or interesting?

MR. BOLKOVIC: I so I think that's the importance that we have as an industry. The sequencing is going to be important in, you know, the overall evolution of whether it's extending trading hours or these things as well, because we have to find alignment on, you know, what is global trading hours, what is extended trading hours. When, you know, is the market closed across equity and the OCC. But it also requires on the clearing member firm side that same evolution to happen. So we obviously also observe and we do get requests in the evening where, you know, operational work still needs to complete at our clearing firms. Sometimes there is operational issues where they request extensions. Those things, you know, still exist and haven't gone away and we need to keep those in mind as we try and solve these as much as we can.

MR. HOLLEY: Thank you.

Jim, did you have --

MR. TOES: No, I just wanted to add, I mean, on the contra exercise instructions, you know, the

rulemaking process always starts kind of like you get a lot of noise about something, you're hearing noise. Then you have a roundtable. You know. Usually, the next step would be good if there was some publicly available data on the frequency and how often it occurs. That would kind of be helpful in determining whether the solution needs to be small, medium, or large.

MR. HOLLEY: Thanks.

So continuing on this theme with a little difference is cash-settled single stock options. So what impact could single stock cash-settled options have?

Historically, physically settled options have helped mitigate the risk of manipulation by imposing an economic cost when extracting profits from a trade. Cash settlement would remove that friction.

What are panelists' thoughts on the potential for single stock cash-settled options?

Start with Kevin.

MR. KENNEDY: Wasn't expecting that. But I'm good because I think about it a lot. And it does remove some of the friction.

I do think we all know you have to design the right kind of settlement, though. Because much easier to manipulate and hurt investors than an index. So I

think it's something we have to give a lot of thought to.

That one, clearly, out of all the things we're going to speak about today, about where I'm concerned that we're you know, ready, go, set, instead of ready, set, go. Cash-settled options would be at the top of that list.

It's appealing, because it just sounds so attractive. Like, wow, just settle for cash. You don't have any of these problems we just spent the last 15 minutes on. But I think we would need to tread very cautiously and really get a lot of input from everybody on all three of these panels.

MR. HOLLEY: Matt.

MR. MacKENZIE: Yeah, thanks. This question prompted a lot of discussion and a diverse array of views with in Optiver when I asked. I think on the one hand, it certainly is an attractive idea, especially for someone who is interested in trading volatility or hedging volatility. It removes that friction.

On the other, you know, there's a concern about drawing liquidity away from the physically settled market and what does that mean more broadly? I have to give a shout out to Jerry Swarbrick, who identified FINRA Rule 2360. I think I got that right, Jerry. That would probably need to be rewritten if we were to do this. So a lot of operational issues may be involved. But, yeah, definitely some interest.

And I think, you know, the overall theme was potential for a rising tide to sort of lift all boats. So more options -- that was not a pun, I promise -- would incentivize greater participation.

MR. HOLLEY: Faris.

MR. MATALKA: I don't have too much on this topic. I mean, we don't see a lot of demand from our clients in terms of cash-settled single stocks. I do recall when the Monday Wednesdays were proposed, there was an industry discussion about can we make these cash settled because of this exercise of assignment, the -- risk that we talked about. And I think the consensus at the time, and I know it takes a lot of the friction out, but it's harder to implement.

You know, these are, from a pairing perspective, in terms of the calculating margin, you would treat these as a separate class versus the physically settled. Can you spread those together between the cash and, you know, how do you treat that? So there is a little complexity at least from our perspective.

I do think just maybe not related to this, I

think what we're seeing the demand is in flex options, and what Cboe is -- coming from the Cboe for our registered RIA business, where they want a European style single stock to hedge some of their concentrated position and not worry about the assignment of risk. I think that is getting a lot of traction from that side.

Maybe back to the cash settled, maybe a good use case for a cash settled is potentially a binary option. And that, you know, I think JJ mentioned the predictive market. You can really, you know, put that as -- I mean, a cash-settled option is a speculative instrument, versus the physical, which the use case is to hedge. This potentially could be, you know, wrapped in a predictive market kind of front end to the client and can really be under the purview of the SEC since it's a security and it's easier to implement as well.

MR. HOLLEY: Mike.

MR. TREACY: Yes. If you think about why options exist, what are they used for? They're primarily used for either speculation, hedging, or yield generation. And if you were to drill down into current zero DTE volumes, and identify how much of that is pure speculation, then my question is simply why not go cash settled?

MR. HOLLEY: Jim.

MR. TOES: I mean our interest on this one is fairly narrow to just flex on -- flex settlement -- cash settled for flex on ETFs. And so we understand, obviously, on the industry side, you know, the capital efficiency, sale in cash versus physical settlement. And that's being balanced against, obviously, the Commission's interest around avoiding potential manipulation on pricing on the close. So we appreciate that.

But the issue that we have is on these flex -- cash-settled flex on ETFs, you know, they have certain liquidity and trading volume thresholds that they have to hit. Which is fine. They're pretty high and that's good. You know, that kind of solves the problem of marking the close on these products. However, you also have this like 50 ETF cap that is causing some angst.

In the last six-month valuation that went through with these ETFs, over 60 met the trading and liquidity thresholds but because they were 51, 52, to 60, they weren't eligible for it. So some type of expansion on that 50 ETF cap would be helpful.

MR. HOLLEY: I'll turn to the next topic, which is stock tokenization.

So if stocks tokenize, including outside of the NMS system, what effect could that have on options?

for example, would it make hard-to-borrow securities less accessible to borrow and therefore raise lending rates?

We'll start with Andrej.

MR. BOLKOVIC: Thank you. I was at an industry conference in March, and I'm not sure if I'm allowed to name the industry. But I think most of us were there as well. But I think that was proof that the digital market infrastructure and traditional market infrastructure are converging at an accelerated pace. Because I think half of the panels and half of the topics were related to that.

We also know that both, you know, exchanges and CSDs are all investing in tokenization capabilities or have done so. The SEC obtained no-action relief for a tokenization pilot covering U.S. equities, ETFs and treasuries. And Nasdaq has filed with the SEC to facilitate trading of tokenized securities.

So if the underlying equity exists in both traditional and tokenized form, so too the options clearing system needs to accommodate both. And this probably has implications for delivery obligations, margin, collateral, and corporate actions.

To answer your question, I think if tokenized shares trade outside the NMS framework, it probably means that the link between the options market and the underlying becomes more complex and most likely borrow costs, settlement timing, and price discovery could be affected. And these would also affect directly into options pricing and risk management.

I've heard a couple of panelists also mention slow and methodical being who we are and what we do, and I'm proud of this industry and how stable and resilient we are, and I'm proud of the OCC team in doing what they do day in and day out. So we are also taking a slow and methodical approach as it relates to tokenization.

We are near term exploring the acceptance of tokenized assets as margin collateral to improve efficiency and also look at, you know, potential expansions into 24/7 trading. We are then for a longer term evaluating what does on-chain clearing mean and how would OCC operate in such a digitally native market structure. Thank you.

MR. HOLLEY: Mike.

MR. TREACY: So Apex as a platform company, it is our job to provide access to whatever comes to market. And agnostic of what we think about the product itself, and when I think about tokenization, I view it as just another form of synthetic risk on another asset.

And again, I think we need to walk before we

run. I think at the OCC, if I own 100 shares of Nvidia tokenized and I go and I sell an upside call, I think to start out, that position should be considered holding a naked call, or some pro rata share of risk.

I think we need to consider what's happened in the past when we've had synthetic risk in the market. And when prices detach from parity. And what happens is we typically see liquidity events.

I'm not saying that's going to happen with tokenization. I just think it's something we need to watch. I also think that we need to watch the leverage that we're extending. Right?

In the crypto industry, you read about 10x leverage on various crypto assets. I think in the equity space, as we tokenize, I don't believe the intention is to allow leverage to start. But I think that we should all, you know, maximum 2x, 3x.

MS. CRIGHTON: If I can just add just on that? I think, Matt, you raised a valid point earlier -- among many, of course -- about how do we think about the ownership of that asset. Right? So much of what happens across the industry is done on a net basis. Right? There's a significant amount of financing that's provided that's not done by kind of moving things in sequence. It's done based on, you know, providing

financing.

And so the question over tokenization, who has title to those assets, what do you have the ability to do with those, I think is one that needs to be answered from a variety of different perspectives. And what does that mean? From execution all the way through to clearing, how does it mean how a clearing firm interacts with a clearinghouse? How do you think about the assets that you have recourse to?

And then to that point, I also think it changes the risk composition potentially of the clearinghouses that are accepting these types of instruments as collateral. Does it change the way we think about non-default losses and how you capitalize for some of the incremental risks that the ecosystem may be taking on?

So I think in that kind of, you know, crawl, walk, run, those are some of the things that we really need to think about as an ecosystem.

MR. BOLKOVIC: And I think I want to highlight like the purpose, obviously, at OCC for any of those assets are mostly important for an event such as default, and default management. Which means that there can't be a question about ownership or title. There can't be a question about convertibility and the value

of it.

So that's why I also mentioned that, you know, while we look at innovation and see how this could potentially help the market in terms of efficiency, it will have to be the crawl, walk, run approach.

MR. HOLLEY: Thank you. Now we'll park the clouds of gloom and doom and talk about something more fun, which is opportunities for growth.

So earlier, I asked you what keeps you up at night. Now I'll ask you what gets you out of bed in the morning as a promising new prospect. We can start with Alicia.

MS. CRIGHTON: Great. Thank you.

Yeah, it's nice to switch from the kind of like dark clouds.

Look, I think the ability to innovate, even having the opportunity to have a conversation like this where we're talking about the ecosystem as a whole and we're raising concerns about what does it mean to be a clearing broker, what does it mean to be a clearinghouse and how do all these pieces come together, the ability to innovate and figure out solutions as a group, I feel like the opportunity to do that here and hopefully going forward is exciting. And that is a good reason to think about wanting to continue and kind of, you know, be a part of this ecosystem.

Certainly capital tailwinds, I think that goes a long way in terms of helping us think about innovating, providing more capacity and more resources to help facilitate client growth. And certainly market structure reform, you know, with some of the items that we've talked about as it relates to maybe changes in the 60/40 rules. Those types of things, allowing us to service our clients in the way that they want to be serviced, allowing us to innovate and do more, that's all really exciting. So those are some of the reasons. And it's an equally long list, is what worries me.

MR. HOLLEY: Thank you. Kevin.

MR. KENNEDY: Good. Because at heart, I'm an optimist. But we're also paid to worry, so I worry.

But always on, to us at Nasdaq, extremely exciting. Like we want to trade 24 hours a day. Starting in equities with 23/5, we'll be ready in December. We are just so excited. And I'm as excited if not more excited to do it in options as well. However, I just think it needs to be measured and deliberate. And not forever.

I would just love to have the Commission step in and say, guys, get this done by X. Understand when day orders are ending, understand when there's an

opening cross, understanding the playbook if something goes wrong, understanding OBSR and what those rules are. Are they different? Does that change the timeline of catastrophic, which catastrophic, as we all know, means the different time notification.

So super excited about -- thrilled about always on. I just want to do that in the right way.

More zero DTE, even with all the comments that we had, I -- make sure we continue to do that.

And just an interesting fact, because I look at this all the time. So the top 55 days in history of U.S. options, equity options trading have all occurred in the last 15 months. Like that's an incredible number. Fifty-five. Like as of the end of Q1. I actually think it's now 56, because I think yesterday was one of those top 55.

But with zero DTE, with extended hours, with everything else we talked about, there is so much to look forward to.

MR. HOLLEY: Ellen.

MS. GREENE: Yeah, I would concur. I mean, there definitely is -- we have a very vibrant ecosystem in the options market. Clearly, just demonstrated by today's event, we have so many interested parties regardless where you're sitting here. We all want to

move this market forward.

And I think an area that's been touched upon is extended hours. Clearly there is a lot of coordination going on on the equity side. And as we look at options, it is really a natural evolution of our broader market for this to move forward.

But when we do look at the equity markets, I think they are doing it in a really mature way, in that they are coordinating the readiness of the SIP, the TRF, and clearing. And all of those requirements need to be in place before we can move forward. Options is going to follow. But I think as folks know, they're fundamentally different.

We've talked about role of market makers today. Very competitive. Quoting millions of listed series. Liquidity fragmented across exchanges, across strikes, expiries. So extending hours means scaling pricing, risk management, and liquidity provision across that entire surface.

From a market quality perspective, extended hours can introduce different trading conditions, particularly in thinner underlying markets. That can lead to wider spreads, less stable pricing, and differences in execution quality, even as quoting obligations remain the same.

There are also practical considerations. For example, the opening rotation still needs to occur within a very tight window, one minute. But at 7:30 in the morning, that's going to be very, very different liquidity conditions.

Separately, the suitability of extended hours will vary across products. Broad-based products are more naturally suited, while single names introduce additional challenges, particularly around news events and event risk. As hours expand, they may also broaden participation across time zones, including international investors, as we touched on today.

So the question isn't really whether to expand hours. It's really how to do so. And again, taking a lesson from the equity markets, that coordination, linkage, harmonization across the ecosystem will be important. So we build on the current market structure rather than fragment it, I think another topic we've heard today.

We've seen this work most recently in zero day to expiration. We started that in broad-based ETFs where liquidity and price formation are most robust, and then expanding to a limited number of single name equity options over time, as we've been discussing. And clearly, there's a lot of caution about moving forward with that.

We think a similar sequencing should occur in equities, where extended night trading was eventually first introduced in a limited set of highly liquid ETFs before expanding more broadly to individual stocks. That sequencing provided a stable environment to observe how these products function over time and different conditions.

Today, we already have a limited number of ETFs that trade in extended hours until 4:15. This seems to present a very natural starting point. Expanding first within these products before moving to single name supports more robust liquidity formation, price formation, and a consistent customer experience as trading hours evolve.

MR. HOLLEY: Thank you.

Faris.

MR. MATALKA: So I kind of lost track of the question. I think it was --

MR. HOLLEY: What gets you up?

MR. MATALKA: What gets me up? So I think I look at the growth, the bullish growth from a retail perspective. It's fascinating to see new accounts adopting options. We track, you know, the time from an account open to putting on a first option trade, that --

those are now in days. It used to be weeks or months.

You could see and you can feel from the education interaction that a lot of interest is in options. And like I mentioned in the -- in my opening statement, we are seeing younger investors trading options, utilizing options, and not just speculative onshore dated options, but using it to hedge portfolio and use it for yield, with all the education that we provide.

So I think naturally with this growth and the innovation of new products that are coming to market, I think it's going to be -- it's a natural evolution to be always on. And I think that's something that we're already offering equities overnight. I think it's a matter of time where options and equities will intersect overnight. I think it's more complex, obviously, to price options overnight and all the corporate action and the complexity. But I think we will get there.

And I think the starting point with the Cboe announcing the GTH expansion, I think that's going to be meaningful and very useful, even just from a trading perspective, but from a risk management perspective.

I do think, to Ellen's point, I think a coordination between the exchanges is really crucial here. And I think SIFMA does a great job, you know,

getting a consensus from the exchange. But I don't think we can rely on Katie's charm for another two years. I think there has to be a framework that really ensures that if Cboe deems a GTH or a 4:00 to 4:14 a regular trading session versus another exchange as a curb session, for example, that creates a lot of complexity for the order types that we provide to our clients. Because everything is predicated on the day, time enforced. I think the definition of day would need to be evolved. But I'm very bullish on options trading for years to come. And it's an exciting time.

MR. HOLLEY: Thank you.

Andrej.

MR. BOLKOVIC: My job is obviously to worry about things, so I might not be as excited as everyone else. I am excited about innovation, and some of the problems that we will be able to solve. If I think about even the more simple things, you know, we kind of sometimes talk about things that are going to happen in the next couple of years. We're excited about, you know, the potential of tokenization. Yet we also still have limitations today where on exchange trading days we have banking holidays, and then we collect margin up front to prefund that gap.

So we're kind of like, you know, talking still

in two different worlds that we will hopefully be resolving. So I do get excited about those future possibilities.

So our view, and we've heard from a couple of panelists as well, and we work closely with the exchanges and our members, but that the -- you know, the direction of continuous trading is inevitable. But the sequencing matters enormously.

Options present unique structural considerations that equities do not. Options pricing depends on continuous reliable reference price for the underlying. And when the underlying markets are open and liquid, pricing models function as intended. And when equity trading trades thin overnight, the reliability of that underlying reference degrades and with it the integrity of option pricing. The ability of market makers to manage their books depends on a functioning underlying market and not just one that's technically open.

Expiration mechanics, margin calls, and end-of-day settlement processes are all built around defined market close times. And extending or eliminating those windows requires rethinking of the entire infrastructure at the clearinghouse level, at the clearing broker's level, and at the exchanges.

So this is not an argument against change. It is an argument about what we heard before about doing the work carefully before committing to a timeline as was suggested. The right approach is a deliberate and phased one. And I think the approach to start off with limited extended trading hours around known high-demand windows with clear metrics will enable us to do so.

I think beyond just going -- the internal coordination, we would welcome the Commission's engagement in building that roadmap with the industry. But not just in isolation form, as an options industry, but actually in coordination with the equity industry. Because the decisions that we make on either side influence one another.

MR. HOLLEY: Thank you.

Dmitriy.

MR. MURAVYEV: Well, I'm very excited for the option market. I think the future is very bright. I never expected the option market to be so big. For example, if we take the notional equity option volume and divide it by the stock volume, it's between 30 and 40 percent. So this is just huge. And I expect to see more growth, especially from shorter maturity.

I think the weekly option on individual names will be introduced, and then eventually the zero DTE

options on individual names. And to me, it seems like the European version is actually very attractive, because it solves the problem with the reference price and the underlying stock. We have a closing option which accounts for more than 10 percent of the underlying equity volume, and it solves so many problems in the market. So I expect the option market to grow. And hopefully, we as academics, with get a little bit more data to work with.

MR. HOLLEY: Jim.

MR. TOES: Yeah. I think, I mean, ETFs, outcome ETFs, it's a very growing -- it's large now, it's growing now. There are some -- obviously -- I think it's pretty easy kind of like to connect trading venues. But when you start getting into the clearing of some of these products, obviously it is -- there's some complexities around that. You know, ETFs clearing at MSCC and the options that are being held within them.

Listen, this is a great product. You know? What it provides as far as liquidity and pricing efficiency to equities, equity markets. If they start doing well, the options market should be doing well on top.

But I just would suggest, you know, if you're going to take this conversation further, that you look

for some ETF representation. You know, a lot of the growth is occurring in those outcome ETFs. They require options to deliver the investment desire of the investor. So things to be bullish about.

MR. HOLLEY: Shelly.

MR. BROWN: Thank you. A few things to consider.

As an exchange, we're in a unique situation that we facilitate trading. And we facilitate trading by allowing the market makers to be more aggressive in posting their quotes. It's not for the exchanges or the clearinghouses to impose new risk on the market makers or the market in general.

I think we need to think long and hard about extended trading hours. There's probably very few people in this room aside from myself and a couple of people who remember we used to trade equity options until 4:10 every afternoon, and we backed off at some point, 4:00. That was a long time ago.

But as we talk about extended trading hours, I think there's a significant flaw in the Cboe proposal. The majority of obvious errors occur around the opening rotation. The Cboe proposal has two opening rotations. You're going to open at 7:00 and you're going to close at 8:25 Central Time, reopen at 8:30. So now we're

imposing upon the market makers two opening rotations that these specialists have a requirement -- maybe that's another significant reason why they should have carveouts, but we can talk about that -- but two opening rotations, two changes at the opening for obvious errors. So it's imposing risk on the industry.

As exchanges, we should be facilitating trading and reducing risk. Things like new risk protections, better technology, better throughput. But let's also talk about quotes. And we talked earlier about quote mitigation and strike mitigation.

If we extend trading hours two hours a day, we're six and a half hours now. If it's similar quoting, you're going to see an instantaneous 20 percent increase in those quote graphs.

So there's a lot of things to think about. So we really should take our time and think through all the unintended consequences.

MR. HOLLEY: Mike.

MR. TREACY: I'm excited about the international growth that we're seeing converging with the new products that we're introducing. We're seeing large growth in South America, Asia, and Europe. And the ability for them to access the U.S. market during their normal day, their market hours, providing that supply to meet their demand, I think it's great. I think everyone in this room should be proud that we have such large demand for U.S. equities, U.S. stocks, U.S. options from international clients. And that's only going to grow.

MR. MacKENZIE: I feel like I should say something, so you don't get the impression that I get up depressed every day.

I would just say as the policy person, I'm very encouraged by the dialogue and all the work and engagement that has come from the SEC's direction to the industry on these issues. I mean, the first public roundtable in more than 20 years is a great sign. And the issues or problems or, you know, idiosyncrasies that we've identified today are probably not, you know, the end of the story. There will continue to be those problems or issues.

And to quote, you know, an iconic member of another dream team, just substitute Angola for problems when you hear, "I don't know anything about Angola, but they're in trouble." That's Charles Barkley, by the way.

MR. HOLLEY: All right, before we move to our final question of the day, I want to quickly acknowledge the contributions of Arissa Ketty (phonetic), Joanne

Kim, other TM staff, Facilities and Security, the security group to help make today possible.

So our last question, we will do kind of a lightning round, go through everybody in the last couple minutes we have left. And this one is inspired by the poeticism of the LOMSWG acronym. So I give you CAMSG, which is the congressionally appointed market structure genie.

If the omnipotent CAMSG granted you one wish that you could only use to improve options market structure, what would you change and, very briefly, what effect would your change have on investors?

So let's start closest to me, Andrej.

MR. BOLKOVIC: If I were granted a wish by the genie, I would like to see a framework that continues and further evolves the support obviously of central clearing, because it will truly recognize the benefit that it brings. And the way that it helps support our industry and growth of the industry as we heard today over the last 53 years, and then in my view also for the growth that we have projected and the exciting things that we've heard today.

MR. HOLLEY: Shelly.

MR. BROWN: So I looked at this question a slightly different way, as I read it. You could only

use to improve options market structure. So that options market structure depends very much on your frame of reference.

So I am going to take off my MIAX hat and put on my market maker hat. I'd like to see a trading floor. I'd like to know what I know today. Single listed equities trades in eighths and quarters. And my acronym is BRN.

(Laughter.)

MR. HOLLEY: That's an old-school genie. Alicia.

MS. CRIGHTON: Thanks. I would like to say let's follow the risk, follow the funding, and make sure when you go through that whole chain we have the right guard rails and protections built in for each of these components. That way, the system can continue to grow in a healthy, resilient, and sustained way.

MR. HOLLEY: Ellen.

MS. GREENE: So as we've discussed, we've created a market structure that incentivizes competition, lowers barriers to entry, and delivers an unparalleled experience for retail investors. In many respects, that model is working. Many would say we've already captured that genie. But there is always room for improvement.

In a fragmented market with 18 exchanges, it's important that we continue to promote clarity, consistency of approach, and a level playing field so all participants can compete fairly.

MR. KENNEDY: I'm a little disappointed in Shelly, because I thought he was going to say, as a former trader like he and I both are, that he was going to wish for three more wishes. Which is what I would have done, Richard, but you qualified it and said it had to be for market structure.

So my wish, honestly, will come across a little bit self-serving, but I need to explain it. So there's something called QBTC, which is Q for Nasdaq, BTC. It's going to be, hopefully, our Nasdaq index listed options QBTC.

Your team has done incredible work trying to get this approved, working with the CFTC. So if the genie came out of the bottle, I'd say can we get that done?

And not just because I want it for my index suite. But because approval of QBTC would provide a clean, regulated bridge between digital assets and institutional market structure, sending a signal that we're really moving together and we're working together with both regulators. So that's really why I want it and that would be my wish.

MR. HOLLEY: It's a great wish. It may be posed in the wrong building.

MR. KENNEDY: That's why I am very -- I made a point to say I am very appreciative of the team here. I really am.

MR. MacKENZIE: Well, Kevin stepped on my joke. So the correct answer, whenever a genie is involved, is to wish for more wishes. So appreciate that.

I think from our perspective, I'd like to associate our firm with the comments that Steve Crutchfield made this morning around lifetime appointments for specialists. I think a competitive and transparent process on specialist appointment would be my wish from the genie.

MR. MATALKA: For me, I think the retail, the market structure is serving the retail investor really well. I mean, I think my wish is attainable. I think maybe a framework to break fraudulent trade. That helps the whole environment and cleanses the system from account takeover.

MR. MURAVYEV: Well, Form 605 for options would be great, because it will provide the objective measures with execution quality and keep us academics

busy.

MR. TOES: So I had two and they both were covered. Kevin and Alicia.

So I guess my wish would be, you know those like fold-up tables that usually come with those chairs? That would be very helpful next time. It's hard to take notes --

MR. KENNEDY: Kind of like at a swim meet or something?

MR. TOES: Yeah, yeah.

MR. TREACY: I don't have a wish for anything today. I have a wish for something that I think could happen in the future and how we as an industry react to it.

In the future, if we have some type of volatility event as a result of artificial intelligence or a large language model that causes some havoc on the market, I would ask that we not immediately turn to overregulate and turn something off. I would ask that we examine what went wrong and not pull the rug on this transformative technology that's helping all of us.

MR. HOLLEY: Jamie.

MR. SELWAY: Those are all wonderful wishes. Back to where we started today, Commissioner Peirce mentioned her wish.

Thank you all and the previous two panels for helping us. Granted, that's important. We mentioned performance measures, I think the division will stand well in her regards.

Thank you all for this panel, for the prior two. Thanks to the Commissioners, thanks to the Chairman for his remarks. As Richard said, thanks to the dedicated team at the Division that helped put this together.

As the Chairman said, this is an incredibly informative day. I think there are potentially lots of things to do which we will take away.

Most importantly though, it's an opportunity for us to see and hear where we might come in and support and help standardize and build on the progress, you know, ORF and other things, where we can help you take the next steps to improve the marketplace.

Once again, feel free to comment. Please comment. Comments are already rolling in. Kroeper had the precise file number. I'll just ask you to search on the website for Options Market Structure Roundtable and find it there.

So with that, thanks again. This concludes the roundtable.

(The roundtable was concluded at 3:21 p.m.)

PROOFREADER'S CERTIFICATE

In The Matter of: ROUNDTABLE ON OPTIONS MARKET STRUCTURE

File Number: OS-0001

Date: Thursday, April 16, 2026

Location: Washington, D.C.

This is to certify that I, _______________, (the undersigned), do hereby swear and affirm that the attached proceedings before the U.S. Securities and Exchange Commission were held according to the record and that this is the original, complete, true and accurate transcript that has been compared to the reporting or recording accomplished at the hearing.

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I, NATE RIVENESS, reporter, hereby certify that the foregoing transcript of 248 pages is a complete, true and accurate transcript of the testimony indicated, held on April 16, 2026, at Washington, D.C. in the matter of: ROUNDTABLE ON OPTIONS MARKET STRUCTURE.

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